# The Financial/Economic Dichotomy in Social Behavioral Dynamics:

## The **Socionomic** Perspective

By Robert R. Prechter Jr. and Wayne D. Parker

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# The Financial/Economic Dichotomy in Social Behavioral Dynamics:

# The Socionomic Perspective

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*Neoclassical economics does not offer a useful model of finance, because economic and financial behavior have different motivational dynamics. The law of supply and demand operates among rational valuers to produce equilibrium in the marketplace for utilitarian goods and services. The efficient market hypothesis (EMH) is a related model applied to financial markets. The socionomic theory of finance (STF) posits that contextual differences between economics and finance produce different behavior, so that in finance the law of supply and demand is irrelevant, and EMH is inappropriate. In finance, uncertainty about valuations by other homogeneous agents induces unconscious, non-rational herding, which follows endogenously regulated fluctuations in social mood, which in turn determine financial fluctuations. This dynamic produces non-mean-reverting dynamism in financial markets, not equilibrium.*

## Introduction

This paper aims to present a fundamental idea about human behavior that may seem fairly simple: In uncertain social situations, people make decisions differently from the way they do either in isolation or in social situations where information relevant to a rational solution is readily available. Under conditions of certainty, people tend to reason consciously, while under conditions of uncertainty, people tend to herd unconsciously. One of the ideas proposed within this new paradigm of *socionomics* (see the appendix) is that, in the aggregate, economic decisions attend the former context, and financial decisions attend the latter.

In the first section, we review problems with various aspects of neoclassical finance theory. In the second section, we articulate the financial/economic dichotomy. The third section presents the socionomic *law of patterned herding* (LPH) as it relates to finance. The fourth section summarizes key differences between economic and finance models. The final section concludes.

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## Problems with Traditional Finance Theories and Their Relationship to the Socionomic Model

The pillars of neoclassical finance theory include the concept of market efficiency, utility and value theory, neoclassical asset pricing theory and business cycle theory. Research has uncovered serious problems with each of these ideas.

### *Efficient Market Hypothesis*

Inquiry begins with a problem. The *efficient market hypothesis* (EMH)—the idea that security prices are rationally determined, "reflect all available information" (Fama [1991, p. 1575]) and seek equilibrium—has become a problem. It fails to explain financial market valuation, and, as studies in behavioral finance have demonstrated (see Smith [2003] for an overview), it fails to consider relevant aspects of human behavior. LeRoy's [1989] summary of the history and prehistory of EMH reviewed some of the evidence against it: variance-bound violations, mean reversion problems, excessive volatility, calendar-based "anomalies" such as the January effect, and other problems.

EMH is further confounded by internal disorder. Not only are there "weak, semi-strong, and strong versions" of the theory (Fama [1970]), but there are also different varieties because each theorist must pair his model of market efficiency with one of the many models of market equilibrium, creating a "joint hypothesis problem" that technically makes EMH untestable.

EMH has also depended on successive theories of aggregate pricing behavior, namely the random walk model (Cootner [1964]) and the martingale model (LeRoy [1989]), both of which have been criticized for unrealistic assumptions. Addressing the random walk model, Lo and MacKinlay [1999, p. 20] pointed out,

> Although the traditional random walk hypothesis restricts the [price increments] to be independently and identically distributed (IID) Gaussian random variables, there is mounting evidence that financial time series often possess time-varying volatilities and deviate from normality.

Samuelson [1965] and Mandelbrot's [1966, 1971] martingale model "assumed risk neutrality, whereas in fact people are risk-averse" (LeRoy [1989, p. 1603]). Despite inconsistencies in the martingale model, "the practice in the efficient capital markets literature is to speak of stock prices as following a martingale" (LeRoy [1989]). Because the martingale version asserts that stock prices incorporate the "rational expectation" (Muth [1961]) of discounted future dividends, the shift from the random walk to the martingale model forever wed EMH to rational choice theory. But behavioral finance has found that non-rational behavior in investors' future expectations undermines rational choice theory as well as the entire theoretical structure related to it.

Critics of EMH, such as Shiller [1984] and Lo and MacKinlay [1999], have become numerous. Evidence of what behavioral economists call "bounded rationality" has precipitated a crisis of sorts for the neoclassical version of finance theory in general and EMH in particular. In Kuhn's [1970] terms, when do enough anomalies in a paradigm pile up to necessitate a paradigm shift?

Even Mandelbrot [2003], one of the fathers of EMH, recently rejected the notion that economics and finance should have similar models:

> From the availability of the multifractal alternative [see Mandelbrot, 1972, 1997, for details of this model], it follows that, today, economics and finance must be sharply distinguished; FBM [fractional Brownian motion] may be arguably applicable to the former but not to the latter. (p. 603)

Socionomic theory has long been compatible with this conclusion (see Prechter [1999, chap. 20]).

*Utility and Value Theory*

Neoclassical utility theory has supported EMH and shares its problems. Utility theory is based on rational choice theory, in which men of all social classes, education levels and degrees of wealth are assumed to act rationally in regard to all their financial decisions, even under highly uncertain and risky conditions. Although Friedman and Savage [1948] adopted Von Neumann and Morgenstern's [1947] assumption of rationality in their analysis of risky investment behavior, they acknowledged in passing,

> It does not, of course, follow that there will exist a utility function that will rationalize in this way the reactions of individuals to risk. It may be that individuals behave inconsistently. ...Further empirical work should make it possible to determine whether or not these implications conform to reality. (p. 282)

The authors further commented on people's capacity for non-rational financial behavior because of their "ignorance of the odds." They quoted Adam Smith's [1776/1994] remarks about men taking irrational financial risks due to "their absurd presumption in their own good fortune" as well as Alfred Marshall's [1890/1920] observation about the financial risk-taking of "young men of an adventurous disposition [who] are more attracted by the prospects of a great success than they are deterred by the fear of failure" (Friedman and Savage [1948, p. 280]). Yet they rejected these ideas in favor of pure rational choice, perhaps because it made for a simpler, more manageable model.

Other neoclassical studies of finance and speculation have likewise assumed difficult or anomalous conditions out of existence to make economists' most convenient statistical tools usable, because without those assumptions, the use of certain statistics is invalid. For example, Farrell's [1966] investigation of whether speculation could be reliably profitable began by assuming the statistical independence of stock price changes. This assumption automatically rules out any chance his model will capture the "fads and fashions" of Shiller [1981, 1984, 2000] or the herding dynamic described here, much less the occasional bubble, "rational" (Treynor [1998]) or otherwise. Under all of these hypothesized conditions, investor decision-making is highly dependent upon previous pricing.

Selective and restrictive assumptions have been nearly ubiquitous in neoclassical finance theory and can render it circular and tautological. Such assumptions allow neoclassical economists to avoid admitting that empirical research has falsified their theories. As Welty [1971] pointed out, difficult-to-model or "irrational" aspects of human behavior are often dismissed by the use of *ceteris paribus* clauses in neoclassical theory. When later empirical data do not confirm the theory, proponents invoke these same clauses to excuse the discrepancy. Ever since Marshall [1890/1920] attempted to formalize utility theory mathematically (per Welty [1971]), such assumptions have rendered neoclassical theory unfalsifiable and thus of dubious scientific merit.

Penrose [1953, p. 608] offered a similar criticism of the infamous *ceteris paribus* device in neoclassical theory, while Hodgson [2001, pp. 232-247] presented perhaps the most devastating critique of its non-falsifiability. Over the years, the long list of "anomalies" in neoclassical finance theory, such as those demonstrated by Kahneman and Tversky [1979], Kahneman, Slovic, and Tversky [1982], Loewenstein and Thaler [1989], and Camerer, Loewenstein, and Rabin [2004], has contradicted the basic assumptions on which the theory's use of certain analytical tools depends. As the anomalies multiplied, economists first began to challenge some of the theory's assumptions and then to call for more predictive models (see MacDougall [1974] and Leontief [1971]).

Some economists have announced theoretical breakthroughs challenging the neoclassical model of finance. But they have cautiously left its most basic assumptions unchanged: mechanistic causality, equilibrium, utility maximizing, rational choice, and the summing of individual agents to model aggregate dynamics. These researchers have essentially invited neoclassical theorists simply to add yet another factor to expand their equations, yielding little significant change in the fundamental underpinnings of finance theory or in its predictive ability.

*Asset Pricing Theory*

Asset pricing theory is a field in which modelers attempt to account for investment values. The dividend discount model (Miller and Modigliani [1961]), for example, states that stock prices are entirely a function of the value of future dividends. This is simply a version of EMH in which the number of exogenous variables presumably affecting a stock's price is reduced to one. It therefore suffers from all the same problems (for critiques of this specific model, see Kleidon [1986] and Shiller [1986]).

Fama and French [2004] presented a devastating critique of the theoretical model of asset pricing most frequently taught in American business schools today: the capital asset pricing model (CAPM) of Sharpe [1964] and Lintner [1965]. To explain why CAPM does not work in the real world, Fama and French [2004] discussed evidence that some aspects of investor behavior are less than completely rational. While other economists have tried to salvage CAPM by adding more complexity to the model, Carhart [1997] acknowledged unresolved problems with "model bias" and admitted that due to the "joint hypothesis problem" mentioned earlier, "I interpret the results from these tests [of my modified CAPM model] with caution" (p. 76).

The idea of occasional non-rationality provides the basis for the most esteemed asset pricing theory within the neoclassical tradition, the "fundamental analysis" of stock prices, best represented by Graham and Dodd [1934]. The idea here is that an investor should be able to calculate a fair price for a stock by figuring out the underlying company's supposed "fundamental value" based on a number of objective features, such as the company's industry position, sales trends, profit margins and earnings, asset composition and liquidity, and its mix of financing (Gitman and Joehnk [1984]).

This version of asset pricing theory does not insist that the market always reflect such "fundamental" value, because emotional investors can cause values to deviate from what they "should" be. A fundamental analyst nevertheless makes two assumptions: 1) that other investors are only temporarily non-rational from time to time (thereby providing bargains and over-priced shares that the fundamental analyst exploits), and 2) that investors will be rational enough at some point to value stocks logically by asset pricing theory.

Because fundamental analysis (like behavioral finance) attributes only intermittent non-rationality to investors, it ultimately depends on equilibrium theory and the rational choice model. According to fundamental analysis, when prices deviate from rational value they will tend inherently to "revert to the mean." See Jegadeesh [1991] and Black [1990] for summaries of the literature.

LeRoy [1989, p. 1586] noted, however, "The only problem with fundamental analysis was that it appeared not to work." Cowles's [1933] study showed that fundamental analysts' forecasts actually yielded worse results than random choice. Stock price action over the past ten years has especially confounded fundamental analysts, who have watched share prices fluctuate wildly despite little change in traditional "fundamental value" (or in some cases despite no fundamental value at all).

Socionomics challenges not just the validity of fundamental-analysis valuation but also its underlying idea of inevitable reversion to the mean. We observe that every proposed stock price mean is changing or arbitrary, being a function of the time period chosen, so stock prices have nothing constant to which to revert.

Data on stock prices as they relate to "fundamental" values confirm this point: Over the past century, the prices that investors have been willing to pay for $1 of dividends from the DJIA has differed by more than ten times (see Figure 1); prices for $1 of S&P earnings have differed by over nine times (see Figure 2); and prices for $1 worth of S&P 400 corporate book value have differed by over thirty times (see Figure 3). Finally, the multiple for an annual percentage point

of yield via S&P 400 stock dividends versus via the same companies' corporate bonds has differed by more than twenty times (see Figure 4).

These data suggest that the stock market is blissfully unaware of the dividend discount model, the earnings discount model, corporate liquidation value, and the Fed's relative-yield pricing model. For the most part, moreover, these values rise and fall together, so dramatic differences are not the result of the market's summing various individual values to achieve an overall equilibrium value; a sum of these values swings just as wildly as its components.

Thus we assert that financial market prices are not stable but dynamic, and they are not dependent upon but rather substantially independent of supposedly related "fundamental" values. From the point of view of fundamental analysis, prices spend far more time deviating from means and values than reflecting them. This history seriously challenges the assumptions of traditional asset pricing theory.

*Business Cycle Theory*

Some neoclassical finance theories offer various conceptions of a "business cycle" to forecast the behavior of financial prices (see Lucas [1980], Plosser [1989] and Mankiw [1989] for overviews). All the diverse theorists—from Jevons [1866] to Schumpeter [1954] to the monetarists to Keynes [1936/1997] —share common assumptions, primarily that aggregate economic activity is attracted to equilibrium. Just as fundamental analysis presumes market oscillation around a value mean, neoclassical business cycle theory presumes economic oscillation around an activity mean, at which supply and demand are stable. Where business cycle theorists have gotten creative is their diverse attempts to explain departures from equilibrium. There is usually no theoretical connection between their explanations for equilibrium and disequilibrium, because neoclassicists have simply taken the former as a theoretical given and the latter as an exception to the rule.

Researchers have found it difficult to find empirical evidence that supports innate equilibrium-seeking in the economy. Faced with data that do not fit the early versions of equilibrium theory, creative neoclassicists have invented ever-more-complicated theories of "multiple equilibria" to try to explain why the economy never seems to revert to its original mean (for examples, see Nielsen [1988], Debreu [1970], Durlauf [1993], and Bhushan, Brown, and Mello [1997]). None of these more complex versions of equilibrium theory has garnered universal acceptance.

*Summary of Theoretical Review*

Neoclassical finance theory—from its bedrock in EMH, rational choice, equilibrium theory and mean reversion to its various expressions relating to utility and value, asset pricing and business cycles—fails to explain convincingly the dynamics of investors' behavior and the aggregate results of their pricing decisions. Worse, the details are so underspecified that empirical research from this perspective seems close to useless when, as Hodgson [2001, p. 237] pointed out, "*any observed behaviour can be fitted into the theory*" (emphasis his). We would add to that already devastating remark that, absent *ceteris paribus* clauses, much observed behavior cannot consistently be fitted into the theory. We hope to offer a more useful alternative.

## The Financial/Economic Dichotomy

Proponents of EMH and related theories assert that financial markets are no different from markets for such things as shoes and bread. Socionomists beg to differ. We wonder how a proponent of EMH would react if he walked into a shoe store and the manager rushed up and told him to "double up" on shoes because prices had skyrocketed, or if nervous customers warned him to postpone purchases of socks because prices had fallen by half. Such behavior never happens in a shoe store. Yet such behavior with respect to share prices happens all the time in a brokerage office. Both situations involve transactions between buyers and sellers, so why is there a difference? We propose that the difference derives from transactional contexts.

*The Law of Supply and Demand*

Prices for utilitarian goods and services are governed by the *law of supply and demand*, a theory developed and expanded by Cournot [1838/1897/1960], Walras [1874/1926/1954], Marshall [1890/1920], Pareto [1906/1927/1971] and others. The essential idea is that prices in economic markets result from the opposing desires of producers to sell dearly and of consumers to buy cheaply. The rational choices of producers and consumers achieve objective values for goods and services. The aggregate result of these opposing desires and rational choices is that markets seek equilibrium, making prices stable. EMH is an attempt to force the law of supply and demand into the realm of financial markets. Muth [1961] and Lucas and Prescott [1971] provided details of such attempts.

But even to a casual observer, price equilibrium is obviously absent from financial markets. If financial markets were efficient and participants were fully rational and knowledgeable, as EMH has proposed, financial price movements would look quite different.

**FIGURE 1**
**Price of $1 Worth of Annual Dividends from the DJIA (DJIA Dividend Yield inverted)**


**FIGURE 2**
**Price of $1 Worth of Annual Earnings from the S&P (S&P Price/Earnings Ratio using trailing 12-month earnings)**

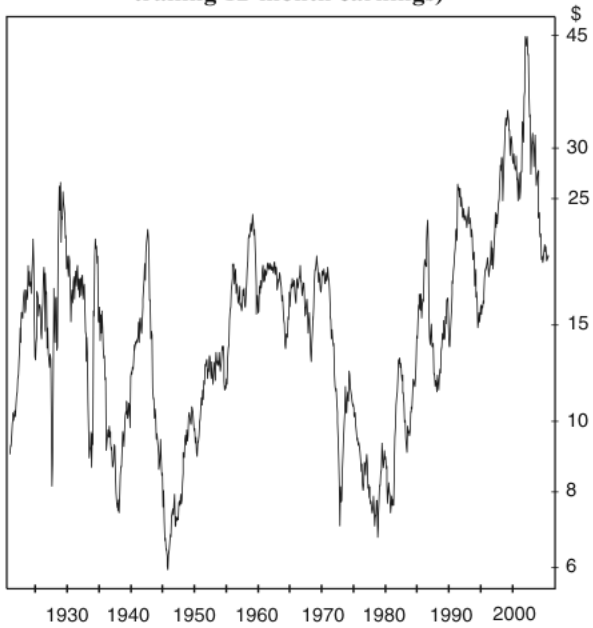
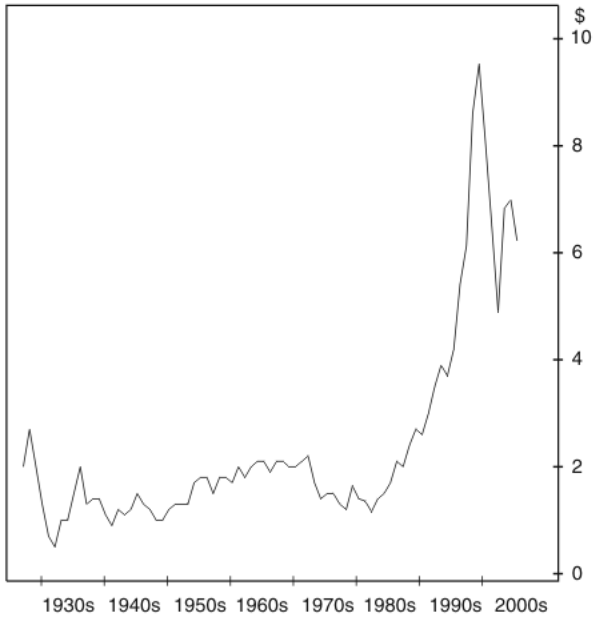
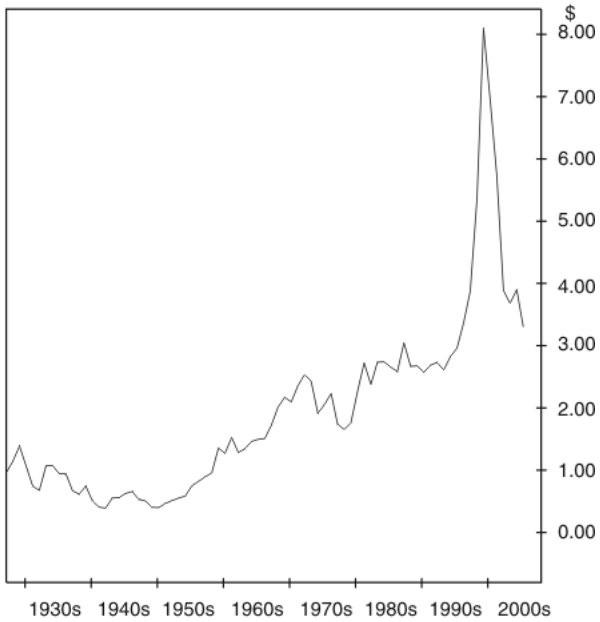



**FIGURE 3**
**Price of $1 Worth of Book Value in the S&P Industrials (S&P 400 price/book value)**




Note. Data from Universal Economics. Adapted with permission.

**FIGURE 4**
**Bond-Yield Price of $1 in Dividends from the S&P Industrial Companies (S&P 400 bond yields/stock yields)**




Note. Data from Universal Economics. Adapted with permission.

Company share prices, for example, would trend mostly sideways, with a near-vertical jump or a drop to a new plane of equilibrium whenever new information came out. But actual financial prices run wildly in one direction and then the other, every minute, hour, day, week, month, year and decade. If the law of supply and demand were regulating financial markets, prices and relative values for investments would be as stable as those for shoes and bread.

Given this difference in market behavior, the theoretical underpinnings of the application of the law of supply and demand to finance are suspect. Ross [1987, p. 30] pointed out that, unlike what occurs in a microeconomic context,

> The demand curves [in finance] are perfectly elastic because of the implicit assumption that financial markets are filled with assets which are very close substitutes for one another.

As a result, Ross drew a sharp distinction between the domains of economics and finance. In finance,

> The forces of supply and demand have no meaning, since if the price is not the equilibrium price, then the difference between supply and demand is infinite. This is precisely what is meant by an arbitrage situation, and it is so qualitatively different from the economist's usual picture of demand and supply as to require a different approach.

Any new finance model must recognize the difference in price behavior between financial assets and utilitarian goods. Before presenting the socionomic model, we first explore a key difference in the relationship between price and demand that exists in these two types of markets.

*Contrasting Economic and Financial Markets in Terms of Price versus Demand Behavior*

For our purposes, we define "economic" markets as those for *utilitarian goods and services*, and "financial" markets as those for *investments and speculations*. Aside from differences in mathematics (per Mandelbrot [2003]) and form (per Frost and Prechter [1978/1998], and Prechter and Goel [2007]), a financial market differs fundamentally from an economic market in the relationship that exists between prices and demand. In economic markets, demand generally rises as prices fall and vice versa. In financial markets, demand generally rises as prices rise and vice versa. This difference is essential because the behavior of economic markets is compatible with the law of supply and demand, while the behavior of financial markets is not. Socionomics offers an explanation for these differences.

Neoclassical utility theorists postulate that price depends on the utility value of the goods or services in question. The perceived scarcity of goods and their relative "desiredness" (Pigou [1920/1932]) in turn determine utility value. Thus, in neoclassical economic theory, lower prices mean greater utility value to consumers per monetary unit expended, so lower prices tend to bring about an increase in demand. This observation holds true for transactions relating to utilitarian goods and services. For example, more computers are selling at $1,000 each today than sold at $5,000 a decade ago, or at $1 million half a century ago. As prices have fallen, sales have risen. Figure 5 shows this inverse correlation between price and demand.

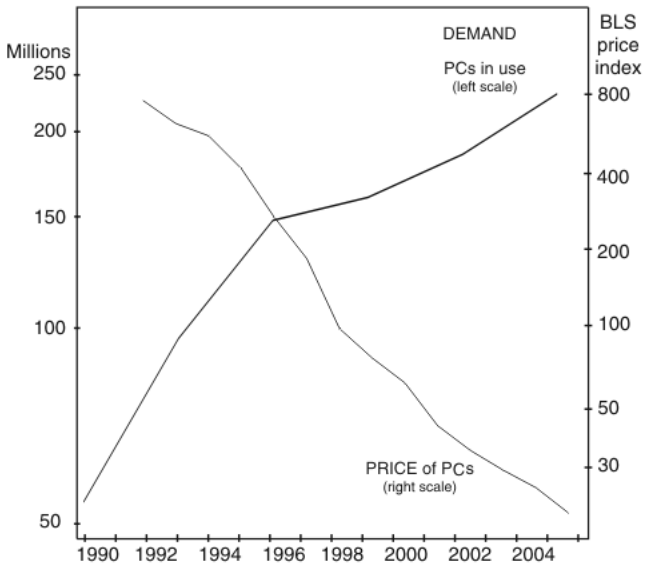
Conversely, a rise in price tends to curtail sales. For example, when gasoline prices go up, some people carpool or take public transit to cut back on the purchase and consumption of gasoline. Again, there is an inverse correlation between price and demand.

Prices for utilitarian goods and services relate to demand this way primarily because people are motivated to survive and thrive, so they apply their conscious reason toward maximizing the utility of their money. Thus, as prices for a particular item rise in an economic setting, consumers tend to buy less of it; as prices fall, they tend to buy more. When people violate this guide to behavior by, for example, wasting their money, those with a lot of money may fail to thrive, and those with little money may fail to survive. Maximizing the utility of money is economically advantageous for people of limited means, a group comprising nearly everybody.

In finance, prices do not influence behavior in this manner. Figures 6-8 demonstrate a positive rather than negative correlation between price and demand over various durations. As Figure 6 shows, the volume of trading in the stock market, in contrast to that for goods and services, also tends to fluctuate in the same direction as price.

Poterba [2001] tabulated various types of data showing that between 1989 and 1998, a decade of nearly uninterrupted rise in stock prices, there was a "rapid growth of stock ownership" and "a broad increase in stock ownership across many different groups" (p. 1). Figure 7, constructed from these data, shows that the number of participants in the stock market tends to fluctuate in the same direction as price. Although some observers have argued that these results derive from external forces such as tax exemptions or age demographics, Poterba's [2001] data show a positive correlation between price and participation regardless of investor age bracket, level of education, annual income or taxable status of the account.

**FIGURE 5**
**Economic Market: Prices Trend Inversely to Customers' Holdings (Price of Personal Computers vs. Personal Computers in Use)**




Note. Data from the Survey of Consumer Finances and the Bureau of Labor Statistics. Adapted with permission.

**FIGURE 6**
**Financial Market: Prices Trend in the Same Direction as Volume (S&P 500 vs.NYSE Volume)**

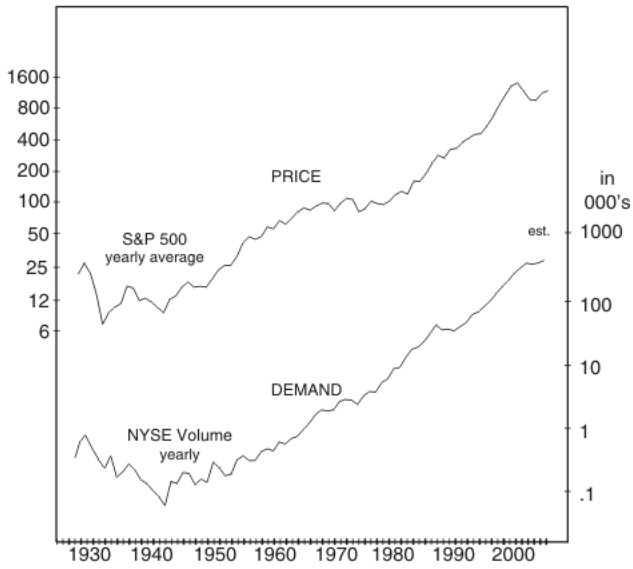
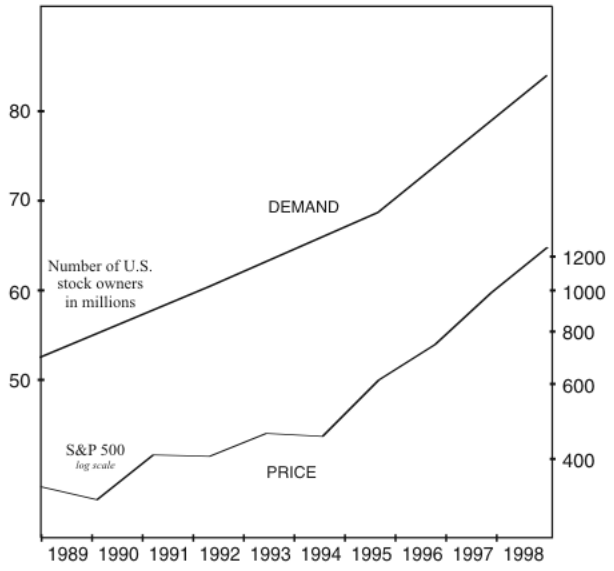



**FIGURE 7**
**Financial Market: Prices Trend in the Same Direction as the Number of Owners (S&P 500 vs. Number of Annual Survey Respondents Who Own Stock)**




Note. Respondents were limited to individuals who are heads of household or married to heads of household. Data from the Survey of Consumer Finances. Adapted with permission.

**FIGURE 8**
**Financial Market: Prices Trend in the Same Direction as Investors' Holdings (S&P 500/PPI vs. Stocks as a Percentage of Household Financial Assets)**

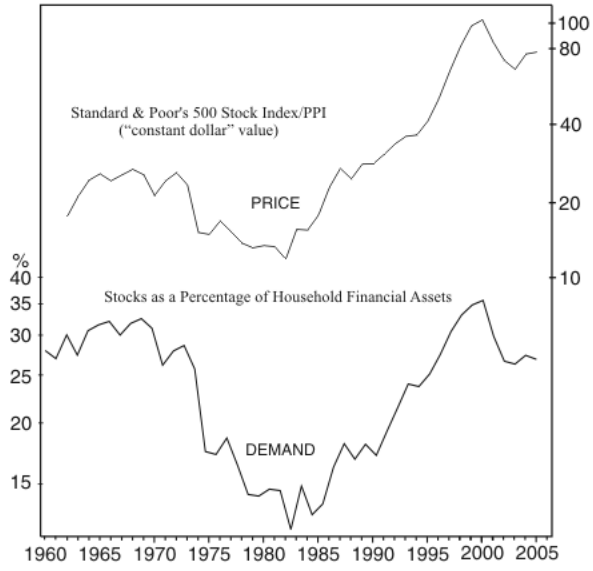
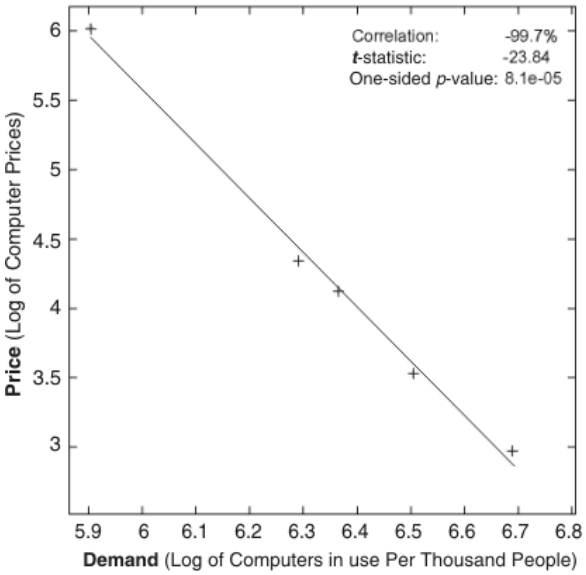


**FIGURE 9**
**Economic Market: Computer Prices Correlate Negatively with Customers' Holdings (Price of PCs vs. PCs in Use, 1991-2005)**




Note. Data from the Survey of Consumer Finances and the Bureau of Labor Statistics. Adapted with permission.

**FIGURE 10**
**Financial Market: Prices Correlate Positively with Volume (S&P 500 vs. NYSE Volume, in Logs, 1928-2005)**

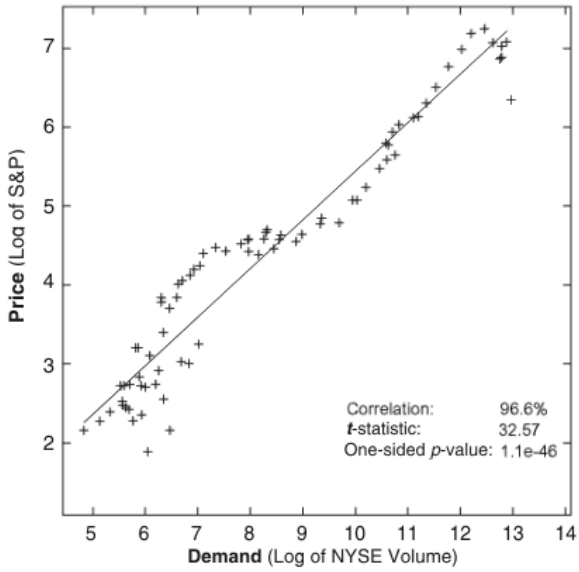



**FIGURE 11**
**Financial Market: Prices Correlate Positively with the Number of Owners (S&P 500 vs. Number of Annual Survey Respondents Who Own Stock, in Logs, 1989-1998)**

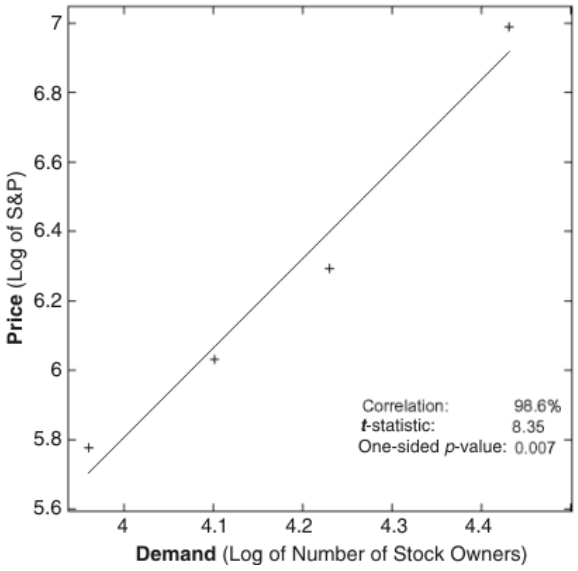
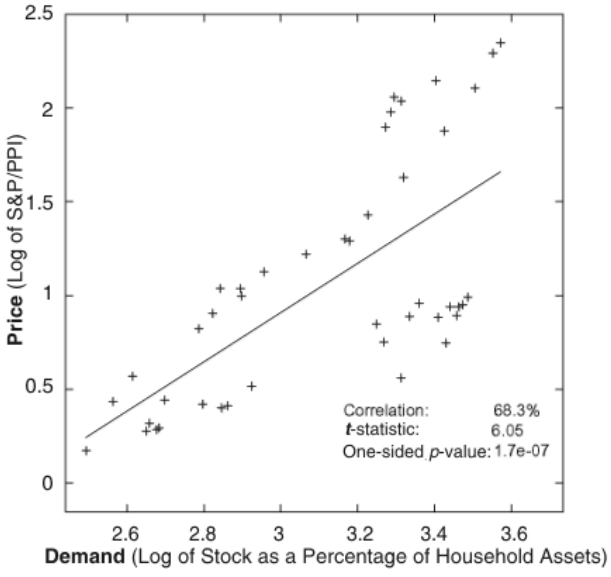



**Figure 12.**
**Financial Market: Prices Correlate Positively with Investors' Holdings (S&P 500/PPI vs. Stocks as a % of Household Financial Assets, in Logs, 1962-2005)**



Finally, Figure 8 shows the U.S. public's relative stock holdings against the prices at which those stocks sold in terms of physical goods. Note that as real stock prices fall, investors actually decrease their percentage of stock holdings. Conversely, as real prices rise, investors increase their percentage of stock holdings.

One of the reasons Poterba [2001] explored to "explain the rise in the number of stockholders" is that "transaction costs associated with stock ownership have declined during the 1990s" (p. 6). Ironically, this explanation, which derives from economics, is utterly at odds with similar thinking about the stock market itself. No one explains the rise in stock ownership during the 1990s by noting that *stock* prices declined, because, contrary to economic logic, they actually soared. Yet it makes perfect sense, in the context of economic motivation, that computer ownership rose in the 1990s because computer prices persistently fell.

Figures 9-12 omit the time dimension from Figures 5-8 and display the same data on price and demand axes to conform to expressions of economic theory. Figure 9 shows the standard relationship taught in economics classes; Figures 10-12 show the opposite relationship. Table 1 lists the exceptionally high negative and positive statistical correlations that we find between price and demand in these economic and financial markets, respectively.

As these graphs and Table 1 show, the relationship between price and demand in finance is the opposite from what it is in economics. As prices rise in a financial setting, volume generally rises, more investors participate, and ownership of financial assets increases; as prices fall, the opposite happens.

If investors in the aggregate applied reason toward maximizing the utility of their money, then one of the two graphs in Figures 6-8 would be inverted, and the lines in Figures 10-12 would decline toward the right rather than rise. People would purchase more stock near a trough and less stock near a peak. But this is not what they do; it is the opposite of what they do.

One might claim that the mechanism behind price change is the same in both settings because increasing demand forces stock prices higher in the way that a sudden increase in demand (for groceries prior to a hurricane, for example) might cause prices of any economic good to rise. Such a relationship in economics, however, can only be temporary; the law of supply and demand assures that the long-term trend is always toward lower demand at higher prices and higher demand at lower prices.

The main situation in which volume rises in a falling stock market is during a panic, as Figure 13 shows. This rise in volume is not due to rising demand for stocks, however. It is due to the rising desire to *disown* stocks, which again is precisely the opposite of what occurs in the economic marketplace.

*Balanced versus Unbalanced Market Dynamics*

In the economic marketplace, the law of supply and demand accounts not only for the motivation of buyers but also for the opposing motivation of sellers. Producers of goods and services desire to get as much money as they can for their products. The higher a

**Table 1.** *Correlation Statistics for Figures 9-12*

| Type of Market | Comparison | Correlation type | Correlation | *t* | *p* (one-sided) |
|---|---|---|---|---|---|
| Economic: Computers | Price vs. Ownership | Direct | -99.7% | -23.8 | $10^{-5}$ |
| | | Returns | -98.6% | -8.3 | 0.007 |
| Financial: Stocks | Price vs. Volume | Direct | 96.6% | 32.6 | $10^{-46}$ |
| | | Returns | 57.0% | 6.0 | $10^{-8}$ |
| Financial: Stocks | Price vs. Participants | Direct | 98.6% | 8.3 | 0.007 |
| | | Returns | 98.7% | 6.2 | 0.05 |
| Financial: Stocks | Price vs. Holdings | Direct | 68.3% | 6.1 | $10^{-7}$ |
| | | Returns | 93.0% | 16.2 | $10^{-19}$ |

Notes: EMH theoretically allows independence of future prices from present prices: If value conditions were to change dramatically, so would price. Stock market statistics imply recent-value dependence (time-lagged self-correlation), as large fluctuations have occurred less often than small ones. Our table uses calculations to account for both views, "Direct" correlations referring to actual values and "Returns" referring to differences between adjacent data points. Figures 9-12 display "Direct" correlations of actual values.

product's price climbs, the more actual and potential producers are motivated to produce it. Conversely, the lower a product's price goes, the more consumers are motivated to buy it.

These conflicting desires create a dynamic balance, arbitrated by price. At some price, enough producers are motivated to produce enough of a product to satisfy demand from enough consumers to create a price for the product that is reasonable to both parties. Values are objective because both parties use reason to maximize the utility of their resources. The opposing desires of producers and consumers on the buy and sell sides of transactions create equilibrium in prices.

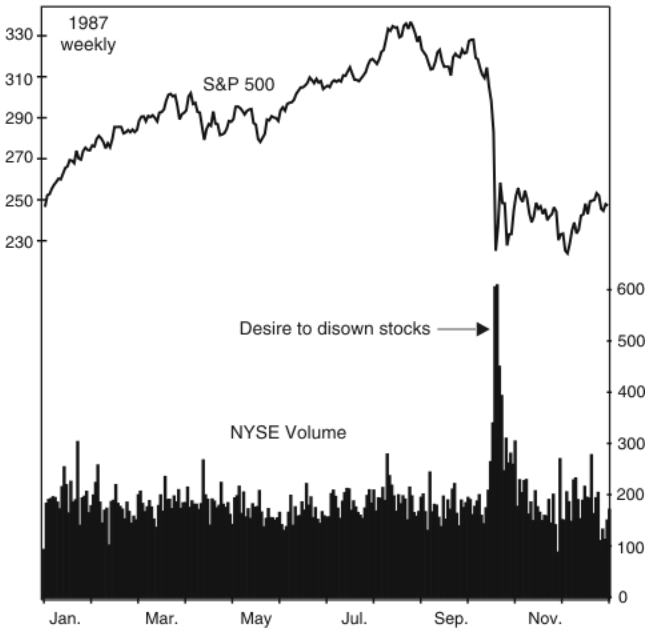
In finance, there is no such balance. It is a common fallacy among financial market professionals to equate those on the sell side of a stock transaction with "producers," and those on the buy side with "consumers," representing "supply" and "demand." But this is a spurious analogy. In the world of transactions for goods and services, producers (supply) and consumers (demand) are separate entities. In the stock market, a "supplier" on Tuesday could be a "demander" on Wednesday. Indeed, many traders buy and sell the same financial instrument continually all day long.

Producers of goods and services do not behave this way. A supplier does not routinely morph into a demander for the good or service he produces, and a demander does not routinely morph into a supplier of each good or service he desires. The fundamental error in equating economic and financial markets with respect to the law of supply and demand is that in financial markets buying and selling are two sides of the same coin, and that coin is demand. When a person's level of demand rises, he buys, and when it falls, he sells.

The stock market does have a few suppliers. Anyone who starts a new business venture and provides new shares of its stock to the marketplace is a supplier. Every investor from that time forward is a demander. Suppliers are rare, and their actions account for a negligible portion of daily volume. Thus, vacillating demanders make up virtually the entire market for stock shares. With respect to each transaction in the utilitarian marketplace, a producer sells and a consumer buys; in the financial marketplace, investors are on both sides of each transaction. In other words, economics has both suppliers and demanders, and finance—practically speaking—has only demanders.

Because the law of supply and demand does not regulate the financial marketplace, there is no balance of desires that prices can arbitrate. Without the governing influence of the law of supply and demand deriving from the conflicting purposes of producers and consumers, financial prices are free to rise or fall wherever investors' aggregate impulses take them. The result is not equilibrium but unceasing dynamism at all degrees of trend. If any law is operating in finance, it must be something other than the law of supply and demand, and it must take into account actual market behavior.

**Figure 13.**
**In Panics, Financial Prices Briefly Correlate Negatively with Volume**
**(S&P 500 vs. NYSE Volume)**




### The Law of Patterned Herding in Finance

As outlined briefly in the appendix, socionomics is a theory of social behavior that integrates a structural model of aggregate behavior with a model of individual agent participation. This paper relates primarily to the individual component of socionomic theory, the *law of patterned herding* (LPH). In brief, LPH states: *Social systems comprising homogeneous agents uncertain about other agents' valuations that are critical to survival and success provide a context in which an endogenously regulated aggregation of unconscious herding impulses constitutes a pattern of social mood, which in turn motivates social actions.*

In this section, we discuss the value of LPH in accounting for individuals' financial behavior within transactional systems as it relates to uncertainty, intentionality relative to valuation by self versus others, unconscious herding impulses, social mood, post hoc rationalization, and the homogeneity of agents.

*Uncertainty Characterizes Financial Decision-Making*

EMH claims that investors simply revalue markets rationally as new information becomes available, implying that investors are never uncertain about current values. But as Alan Greenspan [2003] has said about central banking, "Uncertainty is not just an important feature of the monetary policy landscape, it is the defining characteristic of that landscape." If those with the power to dictate a national interest rate feel chronically uncertain, we can be sure that the average investor is less than perfectly informed, knowledgeable, and confident. Echoing Knight's [1921] and Keynes's [1921] claims back in the 1920s, socionomic theory argues that the role of uncertainty is vitally important to causality in financial markets.

*Intentionality as it Relates to the Importance of Valuation by Self versus Others*

The uncertain valuation of financial assets as opposed to economic goods is not intrinsic to certain things, because some items can serve as either economic goods or investments. For example, tulips in Holland in the 1630s began as goods and became investments. Beanie Babies in the 1990s began as toys and became investments, and, recently, homes have metamorphosed from economic goods into vehicles for speculation as people buy them to "flip" and trade options on their purchase.

The fundamental difference between a utilitarian good and an investment is an agent's intentionality regarding the item. If most owners and potential owners view it as something to be owned for production or pleasure or to be consumed, it is an *economic good*. If most owners and potential owners view it as something to be sold at a higher price to others (short-sellers buy money with stock), it is an *investment*.

When an item is generally viewed as a good to be used, it will have a certain value because individuals will know how to value it over time for their own purposes. When an item is generally viewed as an investment, it will have an uncertain value because individuals will not know how it will be valued over time by others. This distinction, deriving from the mental orientation of the majority of the valuers and the resulting uncertainty of others' valuations, appears to be the source of financial uncertainty. Shiller [1990], for example, found that investors in the heat of emotion during the 1987 crash were "reacting to each other . . . trying to fathom what other investors were likely to do," thus revealing the basis of their uncertainty.

This distinction can apply to any object. A work of art is an economic good to any person who buys it to enjoy. He knows its value to himself, and he pays a reasonable price in the economic context of certain value. A work of art is a financial asset to a person who buys it with the expectation of re-selling it at a higher price. He does not know its value to other people, and he pays a price that may or may not turn out to be useful in the financial context of uncertain value. The same thing applies to shares of stock. People who wish to buy a company in order to use its underlying assets for production are treating the company as a utilitarian good. They are often surprised that others, who may wish to buy shares of the company in order to sell at a higher price, do not share their view of the company's value. And even if a buyer's premise of value is valid in an economic context, it may be invalid in a financial context. We agree with Hogarth [2005] that "one of the major lessons of research in psychology over the last 50 years has been the importance of context" (p. 12). The contextualism of socionomic theory contrasts with the assumptions of neoclassical economics, where, as in physics, the context of agents' mental attitudes is assumed to be irrelevant (see Prechter and Parker [2004]).

This contextual duality between economics and finance does not appear to delineate poles of a continuum but a dichotomy. Except for rare transitional periods, items are consistently priced in the aggregate either economically or financially. We do not fully understand yet what causes a transition from the aggregate intentionality to value something for one's own consumption to the intentionality to value something for speculative trading with others, or vice versa. What we do know is that applying financial thinking to economic goods does not work. And, as Figures 1-4 demonstrate, applying economic thinking to investing does not work, either. Chronic uncertainty about what the majority of other investors may do without regard for personal utility value is sufficient to destroy the efficacy of investing on that basis.

*Herding Characterizes Decision-Making under Uncertainty*

The existence of pervasive market uncertainty is vitally important to the financial/economic dichotomy. When people are certain about the relative utilitarian values of available options, they usually choose an action based on their own rational evaluation. We propose that when people are uncertain about the relative values of available options, they typically default to a herding impulse. In utilitarian economic settings, where certainty is the norm, people reason; in financial settings, where uncertainty is pervasive, they herd.

According to MacLean [1990], herding is an unconscious, impulsive behavior developed and maintained through evolution. Its purpose is to increase the chance of survival. When humans do

not know what to do, they are impelled to act as if others know. Because sometimes others actually do know, herding increases the overall probability of survival. Unfortunately, when investors in a modern financial setting look to the herd for guidance, they do not realize that most others in the herd are just as uninformed, ignorant and uncertain as they are.

*Differences in Neural Processing are Consistent with the Financial/Economic Dichotomy*

Cosmides and Tooby [1994, p. 327] declared that findings from "evolutionary psychology suggest that . . . explicit theories of the structure of the human mind can be made endogenous to economic models in a way that preserves and expands their elegance, parsimony, and explanatory power." In concordance with this inspiration, socionomics proposes that the neural origin of human behavior in economic settings is different from that in financial settings.

Montgomery [1983, 1985] was the first to relate MacLean's [1990] "triune brain" concept to herding in finance. Montgomery postulated that reason and herding are components of aggregate financial valuation. We differ from Montgomery in arguing that individuals' exercises in independent reasoning cancel each other out, making them ineffective in determining aggregate values and leaving herding as the sole determinant of financial price trends. We postulate that economic behavior is mediated primarily by the neocortex, which processes conscious ideas. Financial behavior, on the other hand, is mediated primarily by the limbic system and basal ganglia (see Prechter [1999, chap. 8]), which generate unconscious thoughts and emotions (according to MacLean [1990] and LeDoux [1989], among others).

While more recent research has revealed that both normal and pathological mood regulation involve complex interactions among the limbic system, reticular activating system, prefrontal cortex, sympathetic nervous system and possibly other neural structures, most researchers still credit the limbic system with the central role in coordinating mood regulation. We are also aware of the theoretical and empirical problems with the "limbic-cortical" distinction as a way of describing emotional versus cognitive aspects of mental activity and its neural correlates (see LeDoux [2000] for a detailed summary of these issues). But until a more adequate comprehensive neurological theory of emotion emerges, we use these short-hand designations to describe the relationship between areas of the brain that mediate affect and cognition.

Recent studies support our case that unconscious portions of the brain can motivate herding behavior even while conscious portions are unaware it is happening. In a research review, Camerer, Loewenstein, and Prelec [2004, pp. 7-9] provided a picture of the brain that has more modularity and independence among its neural systems than previously thought.

Bischoff-Grethe et al. [2001] provided neurophysiological evidence that the brain processes information differently in contexts of uncertainty versus certainty, a finding that fits our contextual case for a neurological basis for the financial/economic dichotomy.

A recent study by Shiv et al. [2005] supports this view. The authors found that patients with "chronic and stable focal lesions in specific components of a neural circuitry that has been shown to be critical for the processing of emotions" made investment decisions that "were closer to a profit-maximizing viewpoint" than control subjects. The brain-damaged patients responded less emotionally to other subjects' behavior and were thus better able to execute a logical investing strategy. The researchers noted that "decisions under uncertainty . . . draw upon different neural processes." They concluded: "Depending on the circumstances, moods and emotions can play useful as well as disruptive roles in decision making" (p. 428).

These studies showed no evidence that subjects in group situations were conscious of the nature of the social processes in which they were engaged. Banaji, Lemm, and Carpenter's [2001] review of recent studies illustrates the power and range of unconscious social processes. Over the past thirty-five years or so, social psychologists have found that unconscious dynamics affect memory, perceptual skills, self-concept and self-evaluation, and biases and stereotypes related to race, gender and political partisanship. Socionomics adds financial decision-making to this list.

Herding accounts for human behavior in the financial realm that is anomalous to neoclassical economic theory. The motivation of both types of behavior (financial and economic) is surely the same as that for all evolved behaviors: to survive and thrive. In finance, however, the mind is operating differently. Buyers in a rising market appear unconsciously to think, "The herd must know where the food is. Run with the herd and you will prosper." Sellers in a falling market appear to think, "The herd must know that there is a lion racing toward us. Run with the herd or you will die."

Investors must be aware only of the powerful emotions that attend these unconscious impulses and sometimes of the rationales for their consequent actions. If such motivating impulses were conscious, investors would recognize their inappropriateness for successful investing and use reason to buy low, sell high, and get rich. In the aggregate, however, investors always do the opposite, which is a strong indication that the impulses driving their behavior are unconscious. Even individually, most investors, despite years of his exposure to financial markets, do

the opposite of what they should, again and again. The best way for an investor to change his behavior is to become aware of his herding impulses and counteract them. The rarity of successful investors speaks to the difficulty of success in this task.

Some may find it contradictory that an evolutionary instinct can be both good and bad for survival. But instincts developed in one environmental context can lose their survival value if the environment changes sufficiently. The herding impulse evolved millennia before the creation of speculative financial markets, a modern context in which participants are punished for moving with the herd. In other contexts, such as cultural fads and fashions, the herding impulse may continue to have advantages even in modern times (see Prechter [1999, chap. 15-16]).

*Social Mood as the Basis for Aggregate Financial Valuation*

Because herds are ruled by the majority, financial market trends appear to be based on little more than investors' mood. The term "mood" as we use it is substantially similar to Russell's "prolonged core affect" (see Russell [2003] and Olsen [2003]). "Social mood" we postulate, is the net mood of the populace, shared through the herding impulse.

In light of the role of optimism and pessimism in asset valuation (see McNichols and O'Brien [1997], Easterwood and Nutt [1999], and Hirshleifer [2001]), socionomics posits that the huge differences in valuation exhibited in Figures 1-4 are due to one thing: people's opinion about the capital gain potential of stocks, in other words, the extent to which they are bullish or bearish. Thus, we believe that such valuations are a direct measure of investor optimism or pessimism about the valuations they believe others will place on stock prices.

The idea that affect influences financial decisions is not new (see Dreman [2003, 2004] for reviews of some of the relevant literature). What is new in socionomics is that 1) social mood trends are unconsciously determined by endogenous dynamics, not consciously determined by the rational evaluation of external factors, and 2) investors' unconsciously regulated moods are the primary determinant of the direction of stock prices. In socionomics, the ontology behind the financial markets is a psychological process—namely, valuing and desiring under the influence of an optimistic or pessimistic mood—rather than the ontology of value residing in an external object, waiting to be rationally calculated.

To put it more succinctly, investor moods, generated endogenously and shared via the herding impulse, motivate aggregate stock market values and trends. Moods are the basis upon which investors judge the way they expect other investors to value stocks in the future, so they motivate current buying and selling. Thus in finance there is no mean reversion to equilibrium. There is only the ceaseless dynamism of social mood waves, fluctuating between optimism and pessimism.

*Bubbles are Consistent with Unconscious Risk Aversion, Not Rational Risk Assumption*

The notion that investors are willing to take on more risk as prices rise is a real conundrum for utility value theory. Some theorists nevertheless have proposed explanations within that paradigm. Sornette [2003] postulated that investors participate in a bubble because of their rational acceptance of higher risk in exchange for the potential of higher rewards under the assumption that the bubble will probably continue.

Treynor [1998, p. 69] has argued, as have Blanchard [1979], Diba and Grossman [1988], and Froot and Obstfeld [1991], that "rational bubbles" exist in the stock market. Treynor defined a bubble as a "self-reinforcing, self-perpetuating mechanism that prevents successive security price changes from being random." His model proposes several qualitatively different classes of investors interacting in a way that translates the apparent irrationality of bubbles into rational behavior.

Such analyses have several logical problems. First, if stock prices were mean-reverting, it would be irrational for investors to buy more stock as prices rise further above some calculated mean, because mean reversion would imply a rational expectation that prices would retreat to that mean. Second, the appealing notion of explanation via interactions between heterogeneous investor types (whether fundamental analysts versus technicians, rich versus poor investors, long-term versus short-term traders, experienced traders versus novices, etc.) violates the mathematical assumptions of homogeneity and continuous distributions of price changes required by the statistical tools underlying EMH and equilibrium theory. Finally, there is something troubling about reconciling a bubble with rationality, because the very term "bubble" implies non-rationality.

Socionomics proposes that aggregate investor thought is not conscious reason but unconscious impulsion. The herding impulse is an instrument designed, however improperly for some settings, to reduce risk. As Gajdusek [1970], Janis [1972] and MacLean [1990] demonstrated, straying from the group induces feelings of danger and unease, while herding induces feelings of safety and well being. Therefore, investors in the aggregate—whether they are buying in uptrends or selling in downtrends—are always acting unconsciously to reduce risk, thanks to the emotionally satisfying impulse to herd.

Objectively, risk increases in both cases. But herding is not objective; it is impulsive, so greater risk is actually perceived as less risk. This paradox between reasonable and actual investor behavior accounts for—and indeed explains and predicts—the information in Figures 6-8. Investors who buy in uptrends are not acting consciously to increase risk; they are acting unconsciously to reduce risk by herding. Investors who habitually sell in downtrends are not acting consciously to increase their risk of losing money; they are acting unconsciously to reduce risk, again by herding.

This dichotomy between non-rational, unconscious mental activity in financial behavior and rational, conscious mental activity in economic behavior is what we believe underlies the financial/economic dichotomy. It also appears compatible with Kahneman [2003], who proposed two types of thinking, "System 1" and "System 2," and to Sloman's [1996] related dichotomy between the "associative system" and the "rule-based system" of reasoning.

*Herding and Rationalization*

If the conscious, rational neocortex is not evaluating risk, what is it doing? Bechara et al. [1997, p. 1293] offered neurophysiological evidence that in contexts of risk and uncertainty, "Overt reasoning is preceded by a nonconscious biasing step that uses neural systems other than those that support declarative knowledge."

In accordance with this observation, socionomics (see Prechter [1999, Chap. 8, 2001]) incorporates the idea that the areas of the brain mediating rational thought have a role in the herding process. They provide rationalization, generating plausible justification for an investor's unconsciously induced behavior.

Investors who are unaware of their unconscious motivations use the neocortex—often after the fact—to explain the actions that the herding impulse has impelled. LeDoux [1989] found neural pathways for emotional response that do not go through the neocortex and are faster than the neural processing in the neocortex. This finding is consistent with the socionomic theory that affective impulses (primarily from the limbic system) occur first in financial decision-making, followed later by rationalization (from the neocortex). Without support from rationalization, the herding impulse would encounter resistance from the dictates of reason.

Although most economists know the Italian economist Vilfredo Pareto [1901/1968/1991] for his early contributions to neoclassical equilibrium theory, he is less known for his later sociological theory concerning the basic motivations of human behavior. It features a similar distinction between unconscious drives and conscious rationalizations that people generate a posteriori to explain their own behavior. His postulation of an instinctive "sociability" suggests a herding impulse, and the mental "derivations" that he claimed people use to justify such behavior is akin to the idea of rationalization under socionomic theory (Parker and Prechter [2006]). Burnham [2005, p. 23] reviewed compatible laboratory studies and came to a similar conclusion:

> We are built to cover up the fact that the lizard brain influences us. When we think we have decided to take an action with our rational brain, we often have simply made up a story for the cause of action.

The contrast between economic behavior and financial behavior with respect to rationalization is stark. As stated in Prechter [1999, p. 393],

> Most investors can quickly rationalize selling an investment because its price is falling or buying it because its price is rising, but there is not a soul who desperately rationalizes doing with less bread because the price is falling or who drives his car twice as much because the price of gasoline has doubled.

Shiller's [1990] study of the stock market crash of 1987 provides a good example of the discrepancy between what investors say is the reason for a large market decline and what they actually do as they sell their stock. His survey revealed that the most frequent reasons cited for the crash were that the market was "overpriced" and that large institutional investors were selling when the market hit "stop-loss" points. These ideas sound calm, rational, and at least roughly related to fundamental analysis or rational trading techniques. Shiller's research, however, found that on the day of the big crash, an astounding 43% of his random sample of institutional investors experienced "unusual symptoms of anxiety (difficulty concentrating, sweaty palms, tightness in chest, irritability, or rapid pulse) regarding the stock market" (p. 58).

In contrast to the calm reasoning process that investors reported, Shiller [1990] found that these investors actually displayed "heightened attention and emotion," and were "falling back on intuitive models." The respondents' stated reasons for the huge stock market decline appear to be belated rationalizations for actions borne of panic.

Shiller's [1990] survey data revealed "no recognizable exogenous trigger for the crash." Walker [1998] confirmed, "scholars still debate the reason why" the 1987 crash occurred. Exogenous causes of the even more dramatic crash of 1929 have remained equally elusive for seven decades. The most widely cited explanations are those of Galbraith [1954] and

Kindleberger [2000], both of whom explained the crash in terms of endogenous psychological factors such as "mania" and "fads."

White [1990] reviewed the literature by researchers attempting to find exogenous causes for the 1929 crash and found no compelling case for any such cause or combination of causes. He acknowledged that most scholars "treat the demise of the bull market as an endogenous collapse of expectations" (p. 78).

If economists cannot even retrospectively explain such historic market events in terms of exogenous causes, we should be highly suspicious of ubiquitous daily rationales for market action. Researchers have already demonstrated in laboratory settings that events outside the market are unnecessary for motivating the price movement of investments. Smith, Suchanek, and Williams's [1988] study and others reviewed by Porter and Smith [2003] revealed a boom and bust profile typical of financial herding despite the absence of news. Caldarelli, Marsili, and Zhang [1997] likewise found "a market which behaves surprisingly realistically . . . in spite of . . . the outright exclusion of economic external factors."

News may be more than unnecessary; it may actually be irrelevant. Cutler, Poterba, and Summers [1989, pp. 4-5] statistically tested the idea that the stock market adjusts to major news "bearing on fundamental values" (p. 9). They determined that "macroeconomic news . . . explains only about one fifth of the movement in stock prices" (p. 5). They found "a surprisingly small effect [from] big news [of] political developments . . . and international events" (p. 8). The authors, moreover, judged news as a cause and increased volatility as an effect in the positive cases without considering market direction or establishing causation. But because news is common, it may correlate with volatility in some individual cases simply by chance, causality being another matter.

Prechter [2004] examined eight of the most dramatic events of recent decades and demonstrated their lack of effect on aggregate stock prices despite media claims to the contrary. Data from these studies and others in socionomics (Prechter [1999, 2003, 2004]) suggest there is insufficient evidence to support adopting any opinion on the future direction of the stock market that relies on causes outside the market. In every case, the supposed cause failed to exhibit a reliable correlation with subsequent stock price movements.

Cutler, Poterba, and Summers [1989, pp. 4-5] supported this finding with "the observation that many of the largest market movements in recent years have occurred on days when there were no major news events." The inadequacy of exogenous forces to account for subsequent market actions applies to economic reports, election outcomes, wars and peace treaties, terrorism, corporate earnings, scandals, Fed actions, and the movements of other markets. We find no consistent leading or coincident relationship between these types of events and stock price movement, making them useless for explaining the behavior of the stock market. (To the extent that any relationship does exist, it is a lagging one due to social mood's inducing social actions. See Prechter [1999, chap. 14-16], Table 2 and the appendix.)

Despite this plethora of evidence, however, the vast bulk of market commentary defaults to the theme of exogenous causes. Thus is revealed the immense power of the unconscious: It can impel people to appeal to faulty reasons for stock market movements day after day and not realize it. These unconscious impulses, moods and emotions are so strong that even when confronted with conflicting data, most investors continue to believe in their own particular explanation. They may justify their beliefs as "common sense." This assertion is correct in an ironic sense because humans commonly resort to rationalizing unconsciously motivated actions. In our judgment, rationalization accounts for virtually every external-cause explanation for stock market behavior.

*The Result of Herding in an Inappropriate Setting*

Herding behavior commonly leads to failure in a financial context because the ultimate result of buying high and selling low is loss. Most people don't know how consistently investors lose money in financial markets. They think that everyone else is getting rich. The only people who know the true extent of the public's financial losses are the IRS and those working in the back offices of brokerage firms. The CEO of a futures brokerage firm once confided to us off the record that, in the aggregate, the firm's customers had never once had a winning year. This experience is not likely an anomaly. Most people are too embarrassed to tell the truth, and brokers don't want investors to know. Neither do the authors of the tax code, which calls for taxing annual gains while forcing taxpayers to shoulder nearly the full brunt of accumulated losses.

Examining some numbers will tell the real story. Wolff's [2000] analysis of Federal Reserve data revealed that two-thirds of American households failed to increase their retirement wealth "at all" from 1983 to 1998, despite the fact that U.S. stocks enjoyed their biggest bull market ever during this period. The retirement wealth of the median household during that time actually fell 13%.

Given such dismal performance during a historic bull market, one can imagine how poorly investors typically fare during a bear market. In 1917, a broker using the pseudonym Don Guyon wrote a small book called *One-Way Pockets* (Guyon [1917]). He recounted

that after a full cycle of rise and fall in the market, when stocks were valued at exactly the same place they were at the beginning, every one of his clients had lost money. In searching for an explanation, he found, in essence, moods and herding. His clients were fearful at the start of the bull market and tended to trade in and out constantly. At the market's peak, they felt confident and bullish, and held much more stock "for the long run." Like their modern counterparts in Figure 8, their moods dictated their behavior.

To conclude, LPH accounts for investors' aggregate results. The long-term result of herding behavior in a financial context is not thriving but failure. In rare cases, survival itself may be challenged: Some people go bankrupt from financial speculation, and a few commit murder or suicide.

Is herding therefore irrational? Taking Montgomery's [1985] lead, we use the term *prerational* as opposed to *irrational*, because our unconscious mind is not irrational; it is oriented toward a positive goal. The problem of inefficacy arises when the unconscious mind inappropriately uses this ancient, blunt instrument of self-preservation in a modern finance setting, where herding impedes success and threatens survival.

*Do Prices Motivate Financial Behavior?*

Although it may appear that rising prices in financial assets attract buyers (and vice versa), we argue that they do not (see also Prechter [2003, pp. 217-18]). If buying made prices go up and rising prices made people buy, there would be a positive feedback loop between prices and investor actions. Because price trends continually stop and reverse, there can be no continuously reinforcing feedback loop.

It may be possible to construct a theory of feedback based on heterogeneous agents who react either positively or negatively to price movements in order to explain fluctuations, but we remain skeptical that such a theory could explain why the values of "fundamentals" change so dramatically, as per Figures 1-4. We remain open-minded and welcome all contributions to socionomic theory, but we tentatively conclude that prices are irrelevant to the herding dynamic. Waxing optimism produces rising prices, and waxing pessimism produces falling prices. Aggregate prices are simply an epiphenomenon of unconscious, subjective impulses to buy and sell in accordance with fluctuations in social mood. This is why we are careful (see Figure 16) to discuss how prices *relate* to aggregate demand, not how prices *affect* aggregate demand.

To summarize, in economics, prices are powerful motivators of producer and consumer behavior; in finance, prices are irrelevant to motivating investor behavior. The primary question for investors, regardless of price, is, "Will someone else pay more?" Aggregate financial prices are merely a gauge of aggregate demand, which is a function of investor psychology deriving from social mood.

*Homogeneous Agents*

We have shown that heterogeneity among agents contradicts the underlying assumptions of EMH. But some researchers working in the EMH framework have used it to account for anomalies, thereby producing a theoretical contradiction. LPH is among the minority of herding theories that models the process with homogeneous agents (Parker and Prechter [2005]). We see, for example, no significant differences in action between the traditional classes of "smart money" and "dumb money" when it comes to herding.

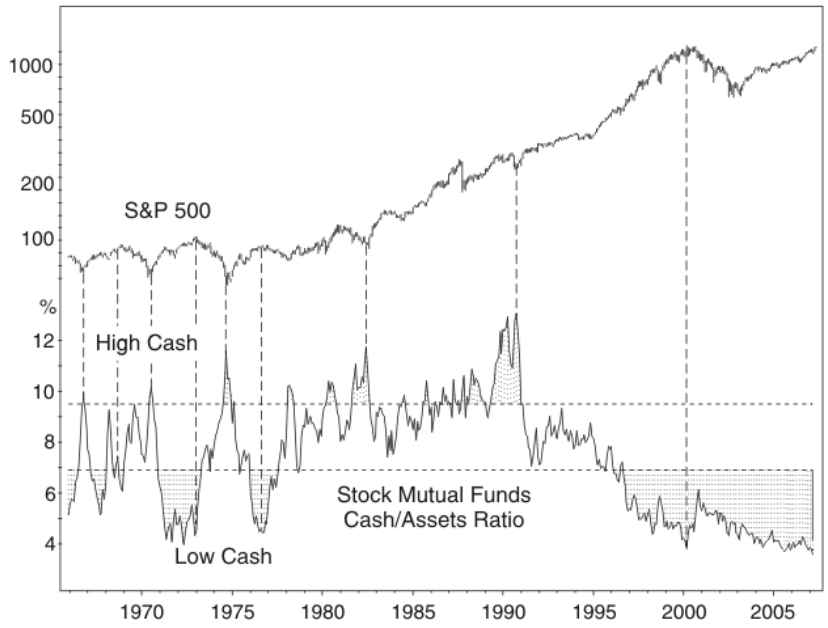
Friedman [1984, pp. 507-508], referring to the pressures of social opinion, tackled the myth of "smart money" head on:

> There is simply no reason to believe that institutional investors are less subject to such social influences on opinion than other investors, and there are substantial grounds for thinking that they may be even more so. To begin, apart from a few lonely Warren Buffetts, institutional investors exist in a community that is exceptionally closely knit by constant communication and mutual exposure. The familiar extent to which economists talk shop with one another, look at the same aspects of the world they study, read the same research, and congregate at [the same] meetings . . . simply pales in comparison to the day-to-day activity of the typical institutional investor.

Olsen [1996] demonstrated that even professional money managers, in the aggregate, fail to beat the market. Sias [2004], Welch [2000], Graham [1999], Trueman [1994], and Scharfstein and Stein [1990] all provided evidence of herding in institutions, investment newsletter writers, brokers, financial analysts and money managers. Although Shiller's [1984, p. 482] model made a distinction between "smart money" and "ordinary investors," he acknowledged that "managers, like the public, are forecasting earnings and may become overly optimistic or pessimistic." Indeed, Figure 14 shows that at good prices for buying, money managers have high levels of cash, and at good prices for selling, they have low levels of cash, exactly the opposite of what they should be doing for maximum return. This outcome cannot be the result of reason, but it is compatible with the idea that professionals are herding, just like the rest of us.

Yet the mechanism of herding is complex and not just a matter of individual ignorance. In fact,

**Figure 14**
**Evidence of Herding by Financial Professionals**
**(S&P 500 vs. Stock Mutual Funds' Cash/Assets Ratio)**




Note. Data from Investment Company Institute. Adapted with permission.

professional money managers with years of experience may be less inclined to herd. But the demands of the herd drive managers to join market trends if they wish to remain in business; if they refuse, customers take their funds elsewhere. Even knowledgeable speculators who wish to profit from the herd may at times decide to buy in an uptrend or sell short in a downtrend. In any case, however, they are refraining from acting on economic valuation and implicitly acknowledging the dominance of the herd by joining it.

We believe that our concept of herding applies to nearly everyone despite—and ultimately because of—varying individual propensities to herd. For example, even Isaac Newton famously waited until the very peak of the South Sea Bubble to buy (Kindleberger [2000, p. 31]), but his personality did not change suddenly from a non-herder to a herder. Each person mentally plays his part in the herding process and then behaviorally joins—or refrains from joining—the herd's actions according to his own thresholds. When Newton was not buying, he was monitoring the crowd, thus participating in the process. He resisted buying for awhile, but he didn't resist the herding instinct.

The fact that some people act with the herd quickly and others do so slowly, tentatively or wholeheartedly is part of the dynamic that produces the aggregate movement. So our model accepts a quantitative heterogeneity of herding impulsivity at the individual level. But this fact is different from the model's assertion of qualitative homogeneity with regard to individual herding impulsivity. Quantitative heterogeneity provides our model with perpetual dynamism, while qualitative homogeneity provides our model with consistency: At the aggregate level, individuals form one homogeneous herd, even if individually their participatory actions differ.

Despite the socionomic assumption of agent homogeneity to explain aggregate financial market behavior, our theory does allow for a certain type of "smart money," which makes it uniquely compatible with real-world observations. We agree with Friedman [1984, p. 507] that "smart money ought to refer not to an advantage in assessing objective considerations but rather to the freedom, at least in comparison with other investors, from being subject to socially determined fads and fashions."

Under socionomics, smart money is managed by those rare investors and traders who 1) have learned to recognize aspects of herding that can be predictive, and 2) can overcome to some degree their own tendency to herd. Unlike EMH, which has no room for successful investors, socionomics accommodates the existence of a few consistently successful traders, investors and managers.

Proponents of the random walk theory have ascribed such success to luck, but successful investors profit far too consistently to be likened to lottery winners. The difficulty that the average person has in mastering his unconscious impulses assures that this type of "smart money" will remain rare. The number

of talented investors is so minuscule when compared to the total number of investors that our model still views the herd as homogeneous.

The incorporation of homogeneous agents completes our outline of LPH as it relates to finance. Our review of herding theories (Parker and Prechter [2005]) demonstrates that LPH is unique: It is the only model of herding that eschews traditional assumptions of equilibrium and utility maximization while positing unconscious, prerational herding behavior derived from endogenous dynamics that have evolved in homogeneous groups of humans and which is applicable only in contexts of uncertainty.

### Contrasting Models of Economics and Finance

Figures 15 and 16 express graphically the economic/financial dichotomy with respect to price behavior and the two separate models that account for it. They show that human motivation in a financial setting is the same as that in an economic setting, but the means and mechanisms are different. In the field of economics, the means are utility maximization, and the mechanism is conscious reason. In the field of finance, the means are herding, and the mechanism is unconscious impulsion. The fields of finance and economics, we assert, are fundamentally different.

Figures 17 and 18 contrast the different features of the regulator of economics, the law of supply and demand, with our proposed regulator of finance, LPH. In an economic setting, markets feature rational (utility-minded, conscious) valuation, equilibrium and objective values. In a financial setting, markets feature prerational (impulsive, unconscious) valuation, dynamism and subjective values. These different laws typically produce different results: success in the economic context, and failure in the financial context.

To complete our presentation of the financial/economic dichotomy, we have added notes to Figures 17 and 18 about the aggregate governors of these distinctly different fields. In both fields, global governors emerge without the knowledge or intention of individual agents. Economics has its dynamic of global constraint, the invisible hand (per Smith [1776/1994, p. 485], Andriopoulos [1999] and Rothschild [1994]). We believe that finance has its dynamic of global constraint, too: a robust, hierarchical fractal called the Wave Principle (WP) (see Frost and Prechter [1978/1998] and Prechter [1999, chap. 1-3]), whose pattern is the P in LPH.

In economics, people act to further their own ends. As a result, they bring cooperation, long-term prosperity and a steady reliability to social relationships, providing a measure of stability to society. In finance, people act to further their own ends as well. But in this case they create waves of affluence and ruin and bring a vacillating unreliability to social relationships, providing a measure of instability to society. In neither role are individuals consciously striving to bring about these results. The combination of these two sets of dynamics imbues society with a wondrous complexity.

Researchers in behavioral finance have made great headway in demolishing EMH, but their theoretical base is often still mired in the economic model of finance, so they propose anomalies to EMH due to human inconsistencies in applying reason. Socionomic theory holds that just as humans in the aggregate are consistent in utilitarian economics, they are likewise consistent in finance. Economics produces a consistency of equilibrium motivated by reason and governed by the law of supply and demand. Finance produces a consistency of dynamism motivated by impulse and governed by LPH.

The reigning—if battered—model of financial markets, EMH, derives from economics. The model we propose as a better description and predictor of financial market behavior is the *socionomic theory of finance* (STF), which derives from socionomics.

Table 2 gives a list of the key differences between these two contrasting models. Points 1-6 in Table 2 are aspects of LPH as discussed here; points 7-9 refer to theoretical issues beyond the scope of this paper, one being aspects of WP and another being the *socionomic hypothesis*, as discussed in the appendix. Table 2 includes these latter points to facilitate an overall comparison of both theories.

### Conclusion: Socionomic Theory Resolves a Long-Standing Theoretical Conflict

Thanks to experiments in behavioral finance, economists have begun to recognize the importance of non-rational and instinctive aspects of human behavior. We propose a theoretical context in which to understand when traditional economic theory applies and when it doesn't. Noelle-Neumann [1993, p. 116] documented this long-running theoretical struggle:

> In the nineteenth and twentieth centuries, two views have repeatedly clashed—the view that stresses instinctual behavior and sees man as determined by herd instincts; and the view that assumes man reacts rationally to the experience of reality. . . . From one historical perspective it can be said that behaviorism has supplanted two different instinct theories, the one by the British biologist Wilfred Trotter [whose 1916 book first popularized the term "herd instinct"] . . . and the other one by McDougall [whose 1920 book *The Group Mind* was a seminal text about social behavior] . . . . The schools of thought that emphasized the rationality of man

**Figure 15.**
**Economics: How Price Relates to Aggregate Demand for Goods & Services**

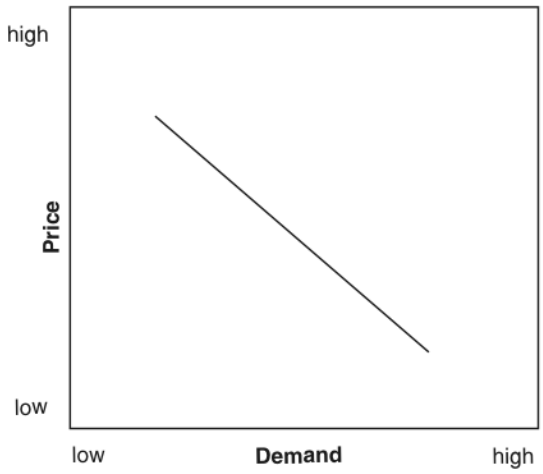



**Figure 16.**
**Finance: How Price Relates to Aggregate Demand for Investments**

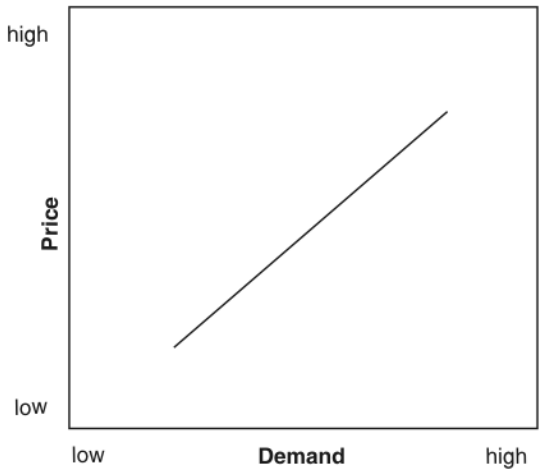
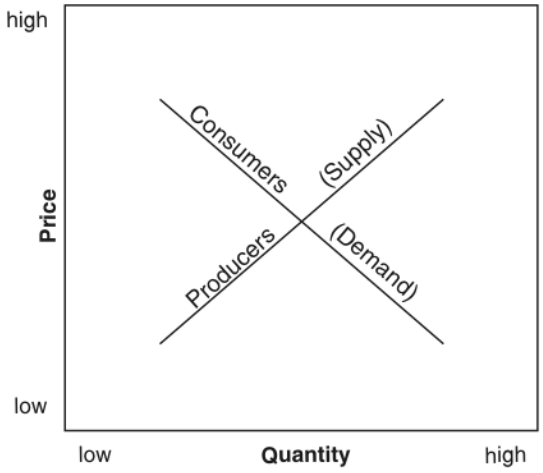
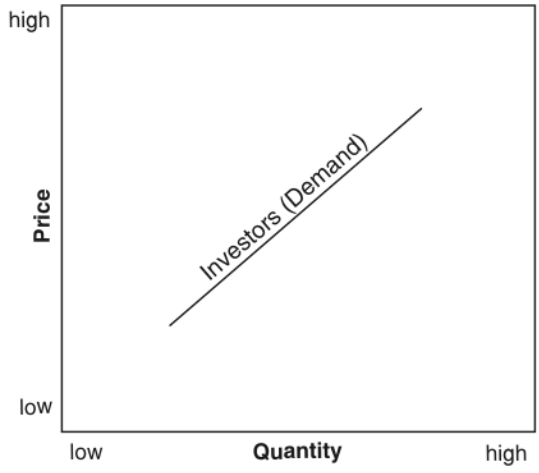



**Figure 17.**
**Economics: Law of Supply & Demand**




Field: Economics
Motivation (goal): Survival and Success
Means: Maximizing Utility
Mechanism: Conscious Reason
Result: Survival and Success
Features: Rational Valuation
Equilibrium
Objective Values
Aggregate Governor: The Invisible Hand

**Figure 18.**
**Finance: Law of Patterned Herding**




Field: Finance
Motivation (goal): Survival and Success
Means: Herding
Mechanism: Unconscious Impulsion
Ultimate Result: Losses
Features: Pre-Rational (Impulsive) Valuation
Dynamism
Subjective Values
Aggregate Governor: The Wave Principle

**Table 2.** *Contrasting Models of Finance*

| Efficient Market Hypothesis (EMH) | Socionomic Theory of Finance (STF) |
|---|---|
| 1. Objective, conscious, rational decisions to maximize utility determine financial values. | 1. Subjective, unconscious, prerational impulses to herd determine financial values. |
| 2. Financial markets tend toward equilibrium and revert to the mean. | 2. Financial markets are dynamic and do not revert to anything. |
| 3. Investors in financial markets typically use information to reason. | 3. Investors in financial markets typically use information to rationalize mood-induced imperatives. |
| 4. Investor decisions are based on knowledge and certainty. | 4. Investors' decisions are fraught with ignorance and uncertainty. |
| 5. Exogenous variables determine most financial decisions. | 5. Endogenous social processes determine most financial decisions. |
| 6. Financial prices derive from individual decisions about value. | 6. Financial prices derive from trends in social mood. |
| 7. Financial prices are random. | 7. Financial prices adhere to an organizing principle at the aggregate level. |
| 8. Financial prices are unpredictable. | 8. Financial prices are probabilistically predictable. |
| 9. Changing events presage changes in the values of associated financial instruments. | 9. Changing values of financial instruments presage changes in associated events. |
| 10. Economic principles govern finance. | 10. Socionomic principles govern finance. |

> regarded imitation as a purposeful [conscious, rational] learning strategy. Because these schools clearly prevailed over the instinct theories, the subject of imitation [as instinctual herding] . . . fell into neglect.

The pendulum of history is beginning to swing in the other direction, but the correct view, we propose, is not an either/or matter. Socionomics provides a different solution: Neither reason nor herd instinct alone offers a full explanation for human social behavior. Humans apply reason in contexts of certainty and the prerational herding impulse in contexts of uncertainty. When certainty about personal valuation applies, people maximize utility and markets seek equilibrium. When uncertainty about others' valuations applies, people herd and markets are dynamic. The first state is common in markets for utilitarian goods and services; the second is common in markets for financial assets.

Socionomics proposes not only the segregation of finance and economics but also their re-integration into a contextual theory of human motivation as it relates to the challenge of survival. The financial/economic dichotomy thus brings to light a key underlying duality in the social experience, thereby enhancing the power of science to understand and predict certain aspects of social behavior. We are confident that the time is right for a new theory of finance. We welcome challenges to STF as well as assistance from colleagues to help pursue this line of research.

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## APPENDIX

### The Socionomic Theory of Finance (STF)

Socionomics is a comprehensive theory of social behavior that describes the causal relationship between social mood and social action. The main theoretical principles are that, in human, complex systems:

- Shared unconscious impulses to herd in contexts of uncertainty lead to mass psychological dynamics manifested as social mood trends.
- These social mood trends conform to a hierarchical fractal called the Wave Principle (WP) and therefore are probabilistically predictable.
- These patterns of human aggregate behavior are form-determined due to endogenous processes, rather than mechanistically determined by exogenous causes.
- Social mood trends determine the character of social actions and are their underlying cause.

The theory integrates a hypothesis of individual agent participation (LPH) with a principle of aggregate organization (WP). The socionomic theory of finance (STF) simply applies LPH and WP to transactional systems.

The body of this paper focuses on the LPH component. Using the language of LPH and adding the WP component, STF proposes that *transactional systems comprising homogeneous agents uncertain about other agents' valuations that are critical to survival and success provide a context in which an endogenously regulated aggregation of unconscious herding impulses constitutes a pattern of social mood. Social mood in turn motivates social actions, one of which is buying and selling in financial markets, records of which manifest as a probabilistically predictable hierarchical fractal described by the Wave Principle.* For a discussion of socionomics' metatheoretical context, see Prechter and Parker [2004].

Point #9 in Table 2 may require some clarification for those unfamiliar with socionomics. The *socionomic hypothesis* (see Prechter [1979/2003, 1985/2003, 1999]) is that social mood trends, which arise endogenously, motivate social action. This is a reversal of the accepted view that social actions—manifested as economic, political, or cultural events—cause changes in social mood.

As far as we know, our formulation is unique in Western thought, although we have found a Russian paper in which Toschenko [1998] proposed that "social mood comprises dominant characteristics of consciousness and behavior, thus allowing social analysts to foretell dynamics of social behavior." This comment is similar but not identical to our socionomic hypothesis.

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