

Social Mood and Financial Economics

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The general level of optimism/pessimism in society is reflected by the emotions of financial decision-makers. Because these emotions are correlated across economic participants, our hypothesis leads to three important outcomes. First, social mood determines the types of decisions made by consumers, investors, and corporate managers alike. Extremes in social mood are characterized by optimistic (pessimistic) aggregate investment and business activity. Second, due to the efficient and emotional nature of stock transactions, the stock market itself is a direct measure or gauge of social mood. Third, since the tone and character of business activity follows, rather than leads, social mood, stock market trends help forecast future financial and economic activity. Specific predictions about stock market levels and trading volume, market volatility, firm expansion, leverage use, and IPO and M&A activity are also given.

Neoclassical financial economics, with a focus on general economic equilibrium, has tended to overlook the influence of social factors. In this, it has tended to follow the example of modern economics, which seems to see itself as an offshoot of physics, mechanics, or applied mathematics. One of the benefits enjoyed by these physical sciences, however, is the ability to study complete systems. That is, they can isolate the properties and characteristics of their theories in experiments.

Much of finance, on the other hand, is modeled in a Robinson Crusoe-type economy—isolated from the social system it belongs to. Yet viewing the economic system within the larger social system may have value. Economic dynamics can be considered an element of social dynamics, or, as Keynes [1955, p. 148] said,

The theory of economic progress is more subordinate than are other portions of economic doctrine to general sociology.

In relating economic equilibrium to social equilibrium, Pareto [1963, pp. 1439–1440] said,

States of the economic system may be regarded as particular cases of the general states of the sociological system.

The economy is not a physical system, but a complex system of human interactions. The physics metaphor may examine stock market behavior from the per-

spective of economic “fundamentals,” but what investors and corporate managers *think* is what drives their actions. And some psychologists would say that what people *think* derives from how they *feel*, which is influenced by their interactions with others.

In Prechter's [1999] “socioeconomic hypothesis,” human interactions spread these emotions and characterize how people will act. When emotion or mood is correlated across society, the level of optimism (pessimism) affects financial decisions and can lead to marketwide phenomena. Several models have explored the effect of social mood on narrowly defined financial decisions. For example, DeLong et al. [1990] describe social mood as investor sentiment that influences stock market prices. Models of corporate finance decisions show the impact of optimism and overconfidence on capital budgeting and capital structure (e.g., Goel and Thakor [2002], Heaton [2002], and Gervais, Heaton, and Odean [2003]).

As we discuss later, researchers often explain the dilemmas surrounding merger waves, initial public offering (IPO) hot and cold markets, and business starts by blaming mass irrationality, sentiment, and optimism. The purpose of this paper is to connect these narrowly focused theories and reinterpret them as economic cases under the general sociological state. The recasting of individual optimism and investor sentiment as specific examples of a larger social mood is important, because it allows for new and more general hypotheses than the more focused models to date.

For example, consider that a high level of optimism in society implies more optimistic investors and corporate managers. This optimism may cause decision-makers to overestimate their probability of success and underestimate the riskiness of their decisions. Many investors will buy stock, trade, and respond to IPOs to excess. At the same time, corporate managers

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will choose to make more corporate investments, use more debt financing, and conduct more acquisitions.

The social mood is also reflected in consumer behavior. When society is optimistic, investors may be more willing to take on additional debt and increase spending. The social mood governing the activities of investors, corporate managers, and consumers drives the stock market up and increases the size of the economy. If social mood rises too high, however, the extreme overconfidence and euphoria can cause a stock market bubble and corporate overinvestment. Alternatively, when society is pessimistic, investors may tend to reduce their portfolio risk, stock markets may decline and become more volatile, and companies may make fewer capital expenditures. Therefore, social mood can be expected to govern the tone and character of financial and economic activity. Prechter [1999] posits this idea in his socionomic hypothesis.

A more general approach to social mood can predict the types and timing of economic activities that may manifest themselves. One financial decision that can be made and implemented quickly is the buy/sell/hold decision of stock market investors. Others, such as the decision to acquire other companies, conduct an IPO, or embark on bold capital budgeting projects, take time to unfold. Economists typically measure these activities after they are completed. Therefore, an improvement in social mood will result in more M&A activity, IPOs, and capital spending several months later.

Financial markets adjust to changes in mood faster than real markets. As Prechter [1999] argues, the influence of social mood on stock market participants is so strong and immediate that stock market activity and its movements are a good measure of social mood and its trends.

The next section reviews human interaction and decision-making. Particularly important is how society's mood and consensus opinions can influence the individual decision-maker. We define the characteristics and ramifications of "social mood," and explain its importance to stock market participants, asset prices, and corporate financial decisions.

Human Interaction and Economics

Human Interaction

Shiller [1995] points out that human society has had an evolutionary advantage in its ability to respond collectively because of our interpersonal communication skills. While communication was historically by speech, technology has developed innovations in writing, telecommunications, broadcasting, and, most recently, the internet. This conversation allows for a rapid exchange of information and opinion.

Economic models of this exchange are in the form of informational cascades (see Bikhchandani, Hirshleifer, and Welch [1992], Banerjee [1992], Elison and Fudenberg [1993]). However, interpersonal conversation seems to be more effective than the one-sided nature of the media (see McGuire [1985]) because it provides more interaction, which stimulates emotions. Along with conveying information, communicating emotion and mood also seem to be important.

For example, conversation is important to the stock market. Stockbrokers converse with clients and other brokers, analysts communicate with executives and managers, and they form local groups and associations to interact with each other. Institutional investors also form groups for sharing information, and individual investors may talk to family, neighbors, colleagues, and friends about investing.

Shiller and Pound [1989] surveyed institutional and individual investors about their patterns of communication, and found that direct interpersonal communications were very important to their investor decisions. Hong, Kubik, and Stein [2005] examine the portfolio holdings of money managers to test the premise that fund managers who work in the same city are more likely to exchange investment ideas by word of mouth. They find that managers in the same city are more likely to trade the same set of stocks. The results are robust to controls for local and familiarity biases. They conclude their evidence is consistent with information being spread via word of mouth.

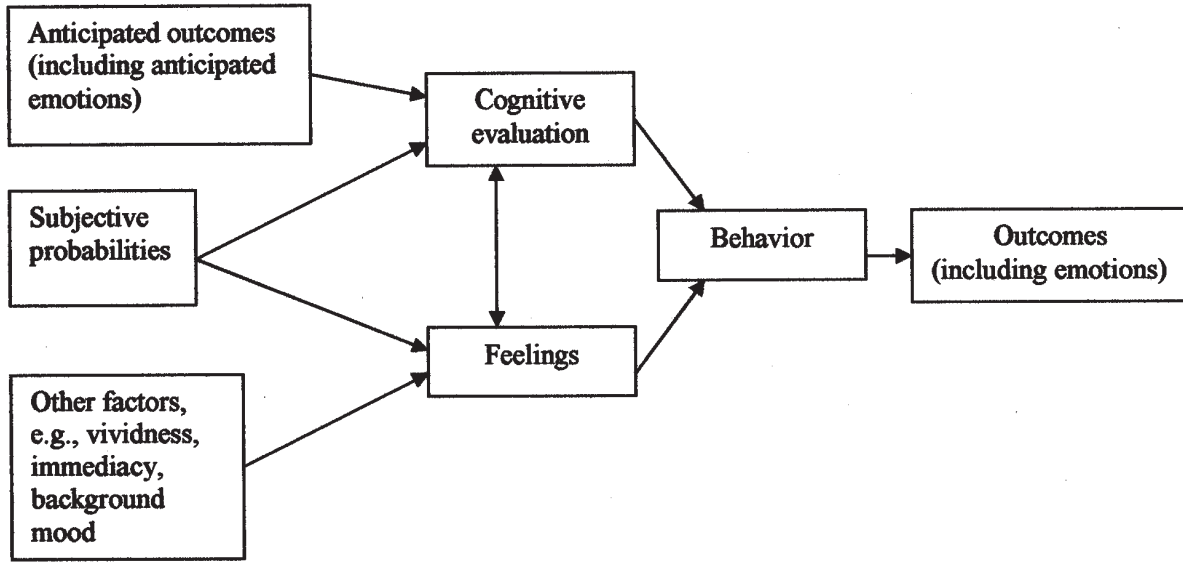
Human interactions are how people share information and communicate emotion and mood. The cues we obtain from others influence our own opinions. A shared attitude, or social mood, is thus propagated.

Emotions and Decision Making Under Uncertainty

Economists and psychologists who study the choices individuals make under risk and uncertainty characterize those decisions as an assessment of the consequences of the alternatives. From the expected utility perspective, people assess the severity and likelihood of the possible outcomes using subjective probabilities and some cognitive expectations-based equations to arrive at a decision.

More recently, psychologists and economists have examined the role of emotions in risky decision-making (e.g., Dowling and Lucey [2005], Elster [1998], Loewenstein [2000], Romer [2000], and Slovic et al. [2002]). Loewenstein et al. [2001] present a model in which unrelated influences to the cognitive evaluation at hand can affect the decision. This model is illustrated in Figure 1. Note that a person anticipates the outcomes of the alternatives and also anticipates the emotions of experiencing those outcomes. This process affects both the cognitive evaluation process and the current emo-

FIGURE 1
Risk-as-Feelings Perspective



Source: Loewenstein et al. [2001].

tional state of the decision-maker. A person must also assess the subjective probabilities of each outcome. Lastly, other factors also affect the process. These include how clearly (or vividly) the outcomes are felt, the immediacy of the situation, and the background mood. We argue that this background mood can have an important influence on a risky decision.

Loewenstein et al.'s [2001] model also illustrates how emotions interact with the cognitive evaluation process to eventually form a decision. At times, emotional reactions diverge from cognitive evaluations and dominate the decision process. Forgas [1995] presents a model that measures to what extent people are likely to rely on emotions in decision-making. He argues that decision characteristics like risk and uncertainty are factors in whether feelings play a role. The greater the complexity and uncertainty of a situation, the more emotions influence the decision.

Slovic et al. [2002] describe the affect heuristic, which has much in common with the Loewenstein et al. [2001] model and has similar outcomes. The term *affect* refers to subtle feelings of which people are often unaware. Pleasant (unpleasant) feelings motivate actions and thoughts to extend (avoid) the feelings. Using the affective impression to make decisions can be easier than weighing the pros, cons, and outcome probabilities. This is especially true when the decision is complex. Since the use of affect can be characterized as a mental shortcut, it is classified as a *heuristic*. The central question then becomes, what is the relative importance between affect and cognition in decision-making?

Slovic et al. [2002] argue that emotions play a large role in decision-making under uncertainty. In one example, they cite the patients of neurologist Antonio Damasio [1994], who had all suffered damage to the ventromedial frontal cortices of the brain. This damage leaves intelligence, memory, and the capacity for logic intact, but impairs the ability to feel. Through various experiments, it is surmised that the lack of emotion in the decision-making process destroys the ability to make rational decisions (see Damasio, Tranel, and Damasio [1990]). Indeed, Damasio's patients became socially dysfunctional after their injuries. Damasio concludes that emotion is an integral component of reason.

Financial decisions are complex and include risk and uncertainty. Thus, the background mood of Loewenstein et al. [2001] and/or the affect heuristic of Slovic et al. [2002] may influence financial decisions. People often misattribute the mood they are in to the decision at hand. That is, people in a good mood may be more optimistic, and people in a bad mood more pessimistic.

Johnson and Tversky [1983] report that misattribution of mood can affect the evaluation of a risky decision. In other words, a person may make decisions partly because of emotional influences that have nothing to do with the situation. If someone is in a good mood, they may be more likely to be optimistic in evaluating an investment. Good (bad) moods will increase (decrease) the likelihood of investing in risky assets, like stocks. The misattribution bias has been tested in financial decisions in several ways. Equity re-

turns are found to be affected by weather-induced moods (Saunders [1993]), sunshine (Hirshleifer and Shumway [2003]), the winter blues (Kamstra, Kramer, and Levi [2003]), and geomagnetic storm-induced moods (Krivelyova and Robotti [2003]). These investigations illustrate that investors misattribute their good/bad mood to perceived economic conditions and stock market prospects.

Social Mood

As the previous section illustrates, an individual's attitudes are not based solely on independent analysis. Interaction with others has a strong influence and leads to a shared emotion, or social mood. Collectively shared opinions and beliefs shape individual decisions, which aggregate into social trends.

The economy is the sum of the economic interactions in society. One person's decision to, say, buy a car or risk the firm's capital on expansion may not affect the economy. But if the social mood fosters many people to buy cars and expand their businesses, then the economy expands. That is, the level of social mood affects the economy because participants interact.

Given the level of attention paid to the monthly consumer confidence data released by The Confidence Board, it appears the media, economists, and investors also find the relationship between mood and the economy important. We go one step further and propose that economic optimism is a subset of social optimism.

We also posit that a substantial change in the attitudes of society will lead to significant and important events in the society. Shiller [1984] models the diffusion of opinion, or mood, through a population using a general epidemic model, i.e., the spread of a mood is similar to the spread of a disease. The rate at which people are exposed to the changing attitudes and are persuaded equals the "infection rate." The parameters of the model can differ from one social movement to another, causing some to be long-lasting, while others are short-lived.

Prechter [1999] argues that changes in social mood cause people to make different decisions. A change in mood may begin with some people undergoing a substantial change or by most people undergoing a small change. These people make decisions and act on this change in mood. Their interaction and communication with others causes further mood swings in others. The collective decisions take time to appear in various ways. For example, a newfound optimism can be seen quickly in the stock market because it takes relatively little time and effort to trade. However, it takes longer for this optimism to be recorded in economic activity because of the additional time needed to plan and execute new business activity.

A Theory of Social Mood

Social mood changes through time. Positive moods lead to productive activities, while negative moods lead to unproductive ones. Consider the simple model of mood in Figure 2. Increasing mood is associated with emotions like optimism, happiness, and hope. These emotions become extreme at the peak, leading to overconfidence, euphoria, and excess. A decreasing mood is associated with pessimism, conservatism, and suspicion. The lowest trough of social mood has strong emotions like fear, stinginess, and antagonism. These moods influence the decisions that create the resulting social activity. Therefore, social mood can be identified by collective behavior, varying from the type and tone of popular films (Prechter [2003]), to the character of laws being debated and enacted.

The level of social mood also determines the general attitude toward business and businesspeople. When social mood is high, corporate CEOs are treated like heroes and business is considered one of the most sacred and important institutions in society. When social mood is low, executives are considered greedy and companies are believed to be cheating the public. During periods of low social mood, these attitudes lead to more government intervention in business. Governments may become more active in antitrust activities (Prechter [2003]), and enact more regulations when social mood is declining. During optimistic times, however, the government may allow more mergers and deregulate industries.

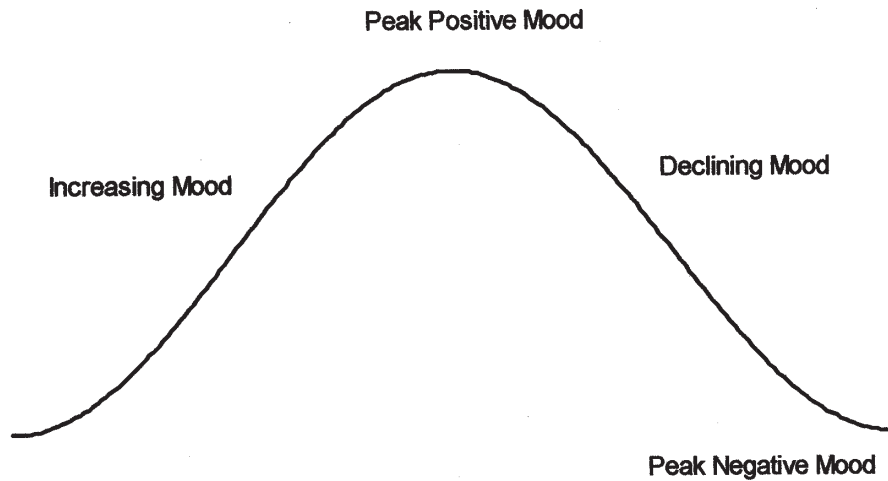
For example, the positive mood periods of the 1920s and the 1990s saw repeals of the separation of commercial and investment banking (Nofsinger and Kim [2003]). The 1990s brought limitations on the ability of investors to sue for corporate fraud. The low mood periods of the 1930s and early 2000s saw laws enacted to increase regulation, creating both the Securities and Exchange Commission and the Public Company Accounting Oversight Board.

Nofsinger and Kim [2003] hypothesize that the changing social mood determines the nature of financial economic decisions, among other social actions. The implications of this theory are important to many areas of finance.

In the following sections, we illustrate how social mood impacts stock markets and corporate finance. For evidence of this hypothesis, we draw on dozens of studies across many areas of financial economics. We emphasize three main predictions:

1. Social mood determines the types of decisions made by consumers, investors, and corporate managers alike.
2. Due to the efficient and emotional nature of stock transactions, the stock market itself is a direct gauge of social mood.

FIGURE 2
Social Mood Cycle and Phases



<i>Emotional Characteristics at Each Phase of the Social Mood Cycle</i>			
Increasing Mood	Peak Positive Mood	Declining Mood	Peak Negative Mood
Optimism	Overconfidence	Pessimism	Fear
Happiness	Euphoria	Sadness	Depression
Generous	Excess	Conservatism	Stinginess
Inclusion	Ambivalence	Exclusion	Segregation
Supportiveness	Graciousness	Defensiveness	Antagonistic
Hope	Trust	Suspicion	Mistrust

- Since the tone and character of business activity follows rather than leads social mood, stock market trends help forecast future financial and economic activity.

Social Mood and the Stock Market

The stock market includes many participants who interact with each other and with society. The collective level of optimism or pessimism in society impacts investor decisions (the “social mood” of Prechter [1999], or the “background mood” of Loewenstein et al. [2001] and Slovic et al. [2002]).

Consider that an investor’s decision to buy or sell a stock is based upon expectations. A rational expectations model assumes that investor expectations derive from using tools like fundamental analysis and modern portfolio theory. These tools require making certain assumptions about the future. What growth rate will the firm achieve over the next three years? What is its expected return, expected variance, and expected correlation with other assets? Even the most sophisticated investors do not agree about which methods produce the most accurate assumptions. The rational expectations model requires investors to resolve these uncertainties

in an unbiased and rational way. Yet investor mood, influenced by social mood, may also impact these assumptions.

Au et al. [2003] examine foreign exchange trading decisions under different mood environments. They find that traders in a good mood environment tended to be overconfident, take unwarranted risks, make less accurate decisions, and perform poorly. Traders in a bad mood environment were more conservative and made more accurate decisions. We see that the general level of optimism in society affects the level of optimism in individuals, which in turn biases important investment opinions and assumptions.

Ivo Welch has implemented several surveys of financial economics professors that revealed interesting points about moods and financial decisions. The first series of surveys were implemented from 1997 through 1998; there was an additional survey in 1999 (Welch [2000]). Altogether, the surveys elicited 226 responses. Note that they were completed during a strong bull market. One question asked about the expected annual equity risk premium over the next thirty years. The median and mean response was 7% and 7.2%, respectively. In another question about stock market return mean reversion versus the random walk, the professors tended to believe that the stock market mean reverts.

Welch [2001] surveyed the profession again in 2001, when the market environment was much different. The S&P 500 had declined approximately 25% from its peak, and general social mood was declining. Given the earlier expression that stock returns may exhibit mean reversion, we expect respondents to predict a higher equity premium estimate after a market decline. However, the median and mean annual thirty-year premiums given were only 5% and 5.5%. 122 of the 510 total respondents had completed the earlier survey. While their updated estimates were about 2% lower, they reiterated their belief that stock returns are mean-reverting. Yet their estimates are not consistent with this belief. They are consistent with the hypothesis that social mood influences a person's predictions for the future. Predictions in periods of optimism lead to high stock return forecasts, and predictions in periods of pessimism lead to low stock return forecasts.

Most individual investors have a lower level of market valuation skills than finance professors, so we might expect their market forecasts to be influenced even more by the general social mood. UBS Paine Webber hires The Gallup Organization to poll 1,000 U.S. individual investors every month to compute their sentiment index. In one question, the poll asks investors what overall annual rate of return they expect the market to earn over the next twelve months (UBS [2002]). On December 31, 1999, when the market was near its peak and the S&P 500 was at 1,469, the investor mean response was 15.3%. One year later, after the market had fallen 10% to 1,320, the investor mean response was 10.5%. The year 2001 closed with a 13% decline in the S&P 500 to 1,148. At the end of 2001, the investor mean response was 8.0%. Finally, after the Index fell another 23% in 2002 to 880, investors expected a market return of 5.9%. The 9.4% difference in expectations over three years illustrates how the level of the stock market, and the social mood accompanying it, influences investor opinions about the future.

The hypothesis also proposes that forecasts will be the most positive at the peak of social mood, when euphoria is common. Consider that forecasts may be made purely by unbiased economic analysis, purely by emotion influenced by social mood, or via some other mixture. The influence of social mood is likely to be higher when it is at an extreme, like a peak or a bottom. Dreman [2001] expresses this idea as follows:

In reality, during periods of mania or panic, psychological influences are actually thought to play the biggest role in the decisions of most money managers and analysts. Cognitive, social and group psychologies all provide abundant experiments illustrating how psychological influences can divert decision-makers from purely rational decision-making.

Indeed, at the peak of the internet stock bubble, many analysts and financial pundits proposed that traditional valuation tools were no longer as helpful in analyzing the "new economy" firms.

Shiller [1984] recognizes that most investors do not understand data analysis, risk adjustments, and have no model (or a very incomplete one) of the behavior of stock prices. As they lack the necessary knowledge and skills for evaluating speculative assets, "the process by which their opinions are derived may be especially social." When social mood affects the attitudes and decisions of stock market participants, the stock market itself can be influenced.¹

Shiller [1984] also mentions this link:

Stock prices are likely to be among the prices that are relatively vulnerable to purely social movements because there is no accepted theory by which to understand the worth of stocks and no clearly predictable consequences to changing one's investments.

He presents a great deal of evidence that social movements are an important cause of stock price movements.

We argue that the stock market itself is a measure or gauge of social mood. Social movements like fads and cultural trends are results, not causes, of changes in social mood, as reflected by changes in aggregate stock prices. This perspective is consistent with the line of inquiry throughout this paper.

Equity Premium

Mehra and Prescott [1985] questioned whether rational investors with constant relative risk aversion (CRRA) utility could account for the high level of the equity risk premium. The rationality and CRRA assumptions fail to account for the time-varying properties of the observed risk premium. Recent models have departed from rational expectations and CRRA.

For example, Abel [2002] explores the impact of tendencies toward pessimism and doubt. His model predicts an equity risk premium closer to historical levels. Abel does not comment on the source of investor pessimism and doubt. Cecchetti, Lam, and Mark [2000] introduce both pessimistic and optimistic investor beliefs. Specifically, investors have relatively pessimistic (optimistic) beliefs about the persistence of the contraction (expansion) states of their endowment growth. By including these distorted beliefs in their model, Cecchetti, Lam, and Mark are able to match both the historical level of the equity risk premium and its volatility.

Mehra and Sah [2002] present a model where investors estimate two subjective parameters, the discount factor and the level of risk aversion. They propose that these estimates fluctuate over time, and that the fluctu-

ations are positively correlated across investors. Introducing these fluctuations allows us to better explain the volatility of equity prices than models using both rational and CRRA assumptions. Mehra and Sah do not explore the source of what they call “mood fluctuations.” However, the optimistic and/or pessimistic parameters used must be correlated across investors. Therefore, we argue that social mood is the source of these distorted beliefs.

Market Volatility

Stock market volatility has been a constant source of controversy among scholars. Two arguments stand out. First, markets become overvalued at times, causing a bubble and an eventual crash. We discuss market bubbles in the next section. Second, the stock market is more volatile than one would expect using rational expectations.

The debate about excess market volatility is summarized in Shiller [2003]. If markets are efficient, the aggregate stock market value must be an estimate of the underlying present value. As this process requires a forecast of future parameters, like dividend growth and discount rates, the market may be periodically wrong, either over- or undervalued. Under rational expectations theory and the efficient market hypothesis, deviations from fundamental value should not be systematic or predictable, however.

The key insight in this controversy is that the forecast must be less variable than what is being forecasted. Otherwise, high estimates would indicate positive forecast errors and low estimates would indicate negative forecast errors, and thus would be predictable. Therefore, Shiller [1981] and LeRoy and Porter [1981] argue that stock market volatility should be lower than the underlying fundamental value. They formulate variance bounds of the underlying fundamental value, and show that the stock market variance exceeds those bounds.

Shiller [2003] compares real stock prices with estimates of fundamental value, estimated as the present value of future dividends using various assumptions. No matter how fundamental value is computed, Shiller illustrates that real stock prices are more volatile than the underlying value. There are periods when the stock market is severely over- or undervalued. But socionomic theory posits that the stock market trends reflect social mood. The volatility of the stock market reflects changes in social mood.

Mood can strongly impact the valuation of an investor who uses present value methods, like the discounted dividend model. To illustrate, we proxy fundamental value using the constant discount rate version, $PV = D_1/(k - g)$. Market participants must predict this constant growth rate. Given the influence of social mood on risky and uncertain decisions, the expected

value of the growth rate, $E(g)$, may become biased.² This in turn biases market value expectations and trading behavior. Market participants estimate their expected market value as $E(P) = D_1/(k - E(g))$.

Consider the deviation of expected market value from the investor's notion of fundamental value:

$$E(P) - PV = \frac{D_1}{k - E(g)} - \frac{D_1}{k - g} \quad (1)$$

Rearranging the variables in Equation (1) produces:

$$\frac{E(P)}{PV} = \frac{k - g}{k - E(g)} \quad (2)$$

Equation (2) illustrates how misvalued expectations develop. Consider an average annual market return of 11% and a long-term dividend growth rate of 5%. When the social mood is high, market participants may be convinced through the media that they are in a “new economy.” In response, they overestimate the growth rate as 7%. Equation (2) then shows that the market may become overvalued by 50%, $E(P)/PV = 1.5$. On the other hand, if social mood is very pessimistic, investors may underestimate the growth rate as 3%. This would lead to the stock market being undervalued by 25%.³

The source of short-term volatility is another stock market puzzle. Schwert [1989] examines monthly stock volatility in relation to the volatility of macroeconomic variables from 1859 to 1987. Some of this analysis is also extended through the first half of 2001 in Schwert [2002]. Schwert [1989] summarizes his findings in several main points:

1. Stock market volatility is high during recessions and other periods of uncertainty such as wars (the Civil War, World War I, and World War II).
2. The market was most volatile during the Great Depression and has been very volatile recently.
3. Stock market volatility does not seem closely related to other measures of economic volatility, except that it is a predictor of macroeconomic volatility.

Schwert [1989] briefly suggested several rational expectations views of the high volatility during the Great Depression because he was “hesitant to cede all this unexplained behavior to social psychologists as evidence of fads or bubbles.” Nevertheless, his findings do seem consistent with social mood. Pessimistic and declining social mood precedes disagreement of opinion, conflict, and strife. This disagreement manifests itself in the market through volatility. Surely, periods

of recession, war, and depression would be considered times of negative social mood.

In summary, the general volatility in the stock market seems too high to simply be caused by rational market decision-makers making unbiased forecasts of the present value of future dividends. Our explanation is that the level of social mood biases forecasts and causes the market to have historically high or low valuations for substantial periods of time. During periods of low (or declining) social mood, the increased general conflict within society is also reflected in stock market volatility.

Bubbles

Market bubbles and subsequent crashes are another expression of stock market volatility. Capital markets throughout history have experienced episodes of widespread euphoric speculation, followed by steady (and sometimes sharp) declines. Notable examples include the 17th century tulip mania, the roaring 1920s stock market, the Japanese stock market of the 1980s, and the most recent technology stock “irrational exuberance.”

Both economists and sociologists have studied these manias. Economists tend to look at economic fundamentals for an explanation,⁴ while sociologists study the “crowd mind.” They tend to find that a stock market mania exhibits the same characteristics as amusement fads or clothing fashion (Visano [2002]). Indeed, they consider manias and panics to be periods when collective behavior and social mood subverts established individual guides of behavior (Turner and Killian [1987]).

Consider the Japanese stock market bubble and the U.S. technology bubble. The Japanese stock market experienced a dramatic rise in the 1980s. The Nikkei began 1984 near 10,000 and peaked in 1989 near 39,000. Then, in nine months, the market fell to 21,000. Three years after the peak, the market had fallen 56%. The market had not recovered even ten years later, when the Nikkei ended 2002 under 9,000. Shiller, Kon-Ya, and Tsutsui [1996] report that the fundamentals of the Japanese economy do not explain the bubble and crash. They posit that investor attitudes may be relevant.

The recent run-up and subsequent crash of technology stocks (particularly internet firms) is another example of a stock market bubble. As early as December 1996, Federal Reserve Bank Chairman Alan Greenspan warned investors about irrational exuberance. Many investors seemed to acknowledge that the stock market was experiencing a bubble, but they invested anyway. Fisher and Statman [2002a] surveyed investors in the late 1990s. Individual investor forecasts imply they believed the market was experiencing

a bubble, but they thought it would continue to inflate. This seems to be an extreme in optimism.

Our view is that speculative bubbles are inflated by the unusually high optimism of investors. A positive social mood influences investor optimism. The peak of this social mood is characterized by emotional decisions, not rigorous evaluation. The cognitive evaluation analysis illustrates that stock prices have become too high, yet the emotion of optimism becomes a stronger influence in the decision-making process. Stories communicated from person to person seem to mollify the cognitive evaluation aspect of decision-making, allowing the emotional side to influence the outcome. A common phrase in a bubble is “We are in a new era, a new economy, in which the traditional views of economics just don’t work.” This was said about railroads in the 1870s, the Federal Reserve System in the 1920s, and the internet in the 1990s. So investors keep buying stocks and drive prices far above historical averages. Shiller [2002] argues that individuals inevitably wind up trusting this common view, even when it may be only superficially plausible. In other words, the optimism of others validates our own optimism.

Eventually, the euphoric social mood begins to decline. The previous degree of optimism proves unfounded. As the optimism bias fades, the cognitive evaluation aspect of the decision process becomes more influential. Prices are viewed as too high; investors stop buying, or even sell. A stock market crash ensues. If social mood drops very low, pessimism will drive prices below historical averages. Thus, the mood in society influences the investor optimism/pessimism that drives speculative asset bubbles and crashes.

Investor and Consumer Sentiment

DeLong et al. [1990] model a class of investors whose expectations about asset returns are not warranted by fundamentals. These expectations are known as investor sentiment. When sentiment is correlated across investors, the model illustrates that strong optimistic (pessimistic) sentiment can cause stock prices to exceed (go lower than) fundamental value for long periods.

As an empirical test of the influence of investor sentiment on asset prices, Lee, Shleifer, and Thaler [1991] examine several puzzles. First, closed-end funds frequently trade at a discount from net asset value (NAV). While the average is around 10%, this discount can vary substantially over time. Also, both discounts and changes in discounts of all closed-end funds tend to be highly correlated with each other. Individual investors are the most active type of investor in closed-end funds, so Lee, Shleifer, and Thaler [1991] argue they are most likely to be sentiment investors. Individual investors are also active in small-company stocks and IPOs. They examine small-firm returns, discounts, and

IPO activity, and find them to be highly correlated. When sentiment investors are optimistic, they are willing to take more risks and buy stocks. Their buying particularly influences closed-end fund prices, which decrease discounts. Their buying also moves small-company stock prices and encourages investment banks to take more firms public. Pessimistic sentiment causes selling, which can be seen in increasing discounts, falling stock prices, and lower IPO activity.

Lee, Shleifer, and Thaler [1991] also examine the relationships between monthly changes in discounts and macroeconomic factors. They conclude that monthly changes in discounts are not highly correlated with fundamentals. Therefore, the sentiment may originate outside the economy.

We argue that investor sentiment is actually a subset of the larger social mood. There is a popular belief that a link exists between how people behave as investors and how they behave as consumers. Consider, as we mentioned earlier, how much attention and importance is given to measures such as the consumer confidence data, as well as the Index of Consumer Expectations released by the University of Michigan's Survey Research Center. We refer to these types of measures as consumer sentiment.

The Index of Consumer Expectations is derived from questions about personal finances, business conditions, and buying conditions. The Center contends that consumer optimism, or pessimism, is an important predictor for the economy. The Center states,

When many people change from an optimistic to a pessimistic view of economic prospects at the same time, it has been repeatedly found that a widespread shift toward postponement of expenditures follows.⁵

The U.S. Department of Commerce's Bureau of Economic Analysis also finds this measure of economic optimism important, and includes it in the composite Index of Leading Indicators. As we argue here, optimism in society leads to economic activities that will be later measured as economic expansion.

Fisher and Statman [2002b] illustrate the misperception that consumer sentiment follows the stock market. They show many instances where the media blames pessimistic attitudes on a declining stock market, and examine the relationship between consumer sentiment, investor sentiment, and stock market levels. They find that investor sentiment and consumer sentiment are highly correlated and move together. We argue that consumer sentiment and investor sentiment are mood outcomes that flow from the same dominant social mood. Fisher and Statman [2002b] also show that sentiment moves concurrently with the stock market.

Jansen and Nahius [2003] study the relationship between the stock market and consumer confidence in

eleven European countries. They find that the strongest relationship is contemporaneous, not lead/lag, suggesting that both investor and consumer activities reflect social mood. However, the stock market is a better measure of social mood because it is measured instantaneously, while spending is measured with a time lag.⁶

Theory Assertions in Investments and Asset Pricing

Social mood affects the thoughts of stock market participants, and, therefore, stock prices. However, the effect is on aggregate valuation levels and occurs over time. This is not a cross-sectional prediction, although it can be considered consistent with Samuelson's [1998] dictum that the stock market is *micro* efficient, but *macro* inefficient.

Jung and Shiller [2002] explore this dictum. Essentially, the stock market is relatively efficient cross-sectionally. Picking the stocks that will provide positive alphas in the near future is difficult at best. Yet the stock market is more predictable in the aggregate and over the long run. Due to changing social moods, long time-series waves of over- and undervaluations occur for the aggregate market.

Positive social mood is characterized by investor and consumer optimism. The mood is quickly incorporated into stock market prices through a disposition toward higher-risk portfolios, stock buying, and greater levels of trading. The stock market rises and eventually becomes overvalued relative to historical averages. Negative social mood is characterized by pessimism and conflict. It coincides with stock price declines, higher volatility, and a flight toward safer portfolios. Lastly, stock market trends are useful measures of social mood trends.

Social Mood and Corporate Finance

This section examines the relationship between psychological and emotional bias in corporate finance decisions. Cognitive bias has a greater potential to influence decision-making in corporate finance than in the capital markets, because fewer individuals are making the decisions. In addition, due to asymmetric information, it is difficult for other stakeholders to assess the rationality of most decisions. But even if they do detect irrationality, most stakeholders do not have much recourse, because they have only limited ability to arbitrage suboptimal decisions. Or, as Heaton [2002] states, "there are larger arbitrage bounds protecting managerial irrationality than protecting security market mispricing."

An expanding literature describes how moods like optimism affect capital budgeting, capital structure, merger activity, and entrepreneurial activity. Most of

this research investigates how the behavior of optimistic managers compares to that of rational managers.⁷ At the end of this section, we recast these predictions for a social mood exhibiting time-varying properties.

Corporate Executive Behavior

March and Shapira [1987] examine corporate managers' perspectives on taking risk. They conclude that:

Managers are quite insensitive to estimates of the probabilities of possible outcomes; their decisions are particularly affected by the way their attention is focused on critical performance targets, and they make a sharp distinction between taking risks and gambling.

These perceptions of risk are different from what we might expect from the classical rational expectations concept of risk-taking. In departing from this classical concept, research is examining the outcomes of corporate executives who may be susceptible to optimism or overconfidence. It is possible that many managers, who have achieved great success just to become top managers, may tend to overestimate their probability of success and underestimate the risk of their decisions. Goel and Thakor [2002] suggest that overconfident managers are more likely to take on riskier decisions because they underestimate the level of risk they are taking.

Since optimistic managers may overestimate the chance of a good performance, they may have a tendency to take on more capital budgeting projects (Heaton [2002]). Gervais, Heaton, and Odean [2003] posit that optimistic managers will believe that the expected net present value of potential projects is greater than it actually is. Their model predicts that optimistic and overconfident managers are more likely to undertake a project more quickly.

Hackbarth [2004] models the capital structure decisions of optimistic and overconfident managers. Specifically, these managers overestimate the growth rate of corporate assets, and underestimate their riskiness. His model predicts that optimism and overconfidence create a predisposition to issuing debt. Because the managers believe that equity is more underpriced than debt, they prefer to grow with internal capital first, debt second, and equity last.

Optimistic managers are more likely to accept more and riskier capital budgeting projects, thus creating a desire for additional capital. If the level of optimism in managers is correlated across the economy, it will be reflected in increasing business investment.

Mergers

The quantity of mergers and acquisitions over time has been somewhat of a puzzle. Financial economists

have yet to find a consistent return to acquiring firms. At best, the literature suggests, mergers bring no value on average. At worst, the average merger destroys the acquirer's wealth. Yet Rappaport and Sirower [1999] report there were 12,356 announced mergers involving U.S. targets in 1998 alone.

One explanation for this large number comes from the idea that the managers of acquiring firms are optimistic or overconfident. Roll [1986], in his "hubris hypothesis," suggests that bidding firms irrationally fail to incorporate the winner's curse. Thus, they continue to bid in a takeover process that has a negative expected value. The bidding manager's decision is similar to the capital budgeting decision.

Malmendier and Tate [2003] model manager behavior using optimism and overconfidence characteristics similar to those discussed in the capital budgeting and capital structure discussion above. Overconfident CEOs are more likely to conduct mergers, because they overvalue the target firm's assets and overestimate the returns from potential synergies. Empirically, they find that overconfident CEOs are more likely to conduct a merger than rational CEOs. The resulting operations of the merged firm also support this hypothesis. In a sample of highly leveraged acquisitions, Kaplan and Ruback [1995] show that realized earnings end up lower, on average, in the first couple of years than acquiring managers forecasted.

Mitchell and Mulherin [1996] study mergers and conclude that 1) mergers occur in waves, and 2) within each wave, mergers cluster by industry. They posit that the merger waves are caused by unexpected industry shocks. Andrade, Mitchell, and Stafford [2001] argue that the most likely shocks are from deregulation. They identify the key industry deregulations of the past several decades and relate those industries to the merger waves. They conclude:

The fact is that deregulation precipitated widespread consolidation and restructuring of a few industries in the 1990s, frequently accomplished through merger.

We argue that merger waves are due to the high social mood that causes more CEOs to be optimistic. Merger waves are one result of a social mood cycle. In addition, the deregulation shock is not exogenous because it does not occur on its own. It happens because many participants in the industry want deregulation and lobby politicians for changes in the law. Deregulation itself is the result of the same changes in social mood that later result in the merger wave (Nofsinger and Kim [2003]).

Rosen [2005] examines the short-term market reaction to merger announcements and the long-term performance of the bidder. He finds that merger announcements made during hot merger markets (or merger waves) have larger short-term market reaction

than those made during cold merger markets. However, the positive short-term reaction is reversed by poor long-term performance. He concludes the evidence is consistent with the hypothesis that managerial irrationality (like overconfidence or hubris) plays a role in mergers. But he finds that investor optimism is also a factor. The paper concludes by stating:

If investor sentiment affects the market reaction to a merger, then merger waves might reflect swings in investor optimism as much as the conditions of the merging firms or the economy.

Rosen therefore connects manager optimism with investor optimism. We argue that the optimism of the two groups is indeed correlated, because the general level of optimism in society affects both groups.

To illustrate, Figure 3 shows stock market level graphed with the value of merger deals⁸ each year. The level of optimism/pessimism between corporate managers and investors appears highly correlated. Note that the M&A deals generally lag the market trends during increasing social mood and stock price periods. However, the lag does not appear to be as long in the decreasing mood and stock price periods. We argue this is because halting a deal in progress can be done more quickly than starting a new deal.

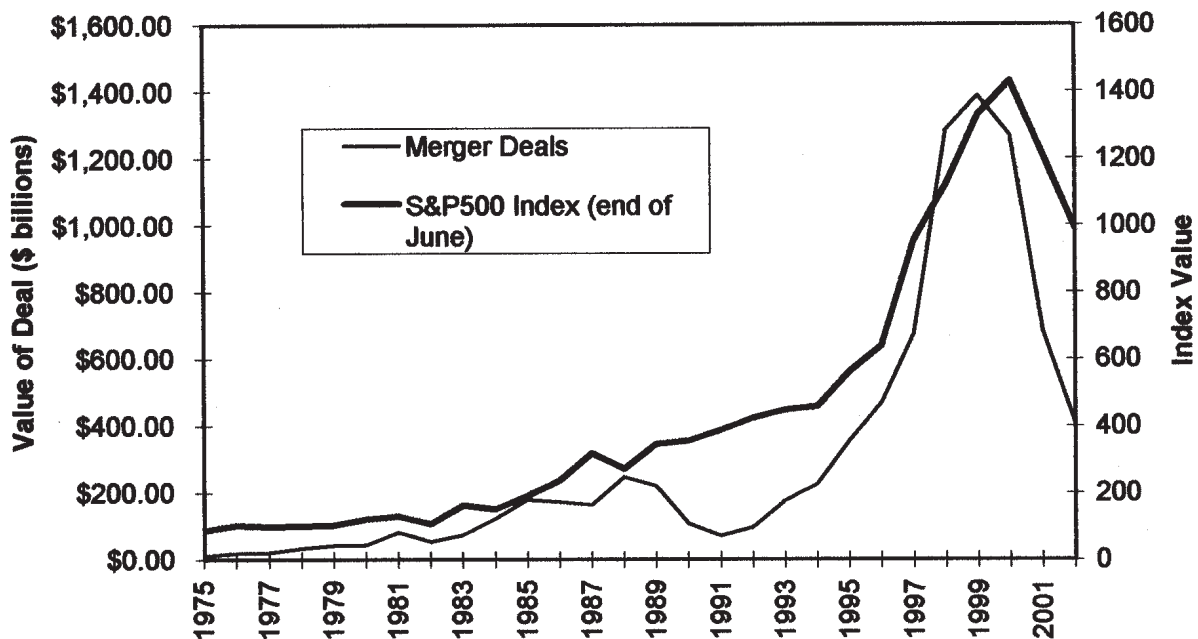
Corporate mergers must comply with federal anti-trust law. The Clayton Act forbids a firm to purchase

the assets or the stock of another firm if the purchase might substantially lessen competition. The U.S. Department of Justice examines each merger and how it will affect competition, and can block the merger. When social mood is high, few major mergers get blocked. Alternatively, mergers that would have been approved during high social mood periods frequently do get blocked during low social mood periods. In a high social mood period like the 1990s, megamergers that created oligopolies occurred in the cable, finance, publishing, and telecommunication industries, to name just a few. Alternatively, as the mood changed in 2000, the government blocked Worldcom's purchase of Sprint, the Heinz purchase of BeechNut Nutrition, and Burlington Northern Santa Fe's purchase of Canadian National Railway. Other mergers, like AOL and Time Warner, were allowed but received a great deal of scrutiny.

Initial Public Offerings

The volume of IPOs has historically occurred in waves. For example, Lowry [2003] reports that 329 firms went public during the seven-year period from 1973 to 1979. In the next seven-year period starting in 1980, more than ten times the number of firms went public (3,805). Lowry investigates three hypotheses as to the cause of these waves: capital demands, information asymmetry, and investor sentiment hypotheses.

FIGURE 3
The M&A Deal Value and the Stock Market



Source: Mergerstat.

The capital demands explanation is that IPO volume varies with the business cycle. Private firms demand more capital during economic expansions, and going public is one way to access capital. The information asymmetry argument reflects a potential “lemons” problem during periods of uncertainty. Adverse selection costs vary over time and managers have an incentive to issue equity when a firm is overvalued. The investor sentiment hypothesis states that IPO volume is driven by investor optimism. During some periods, investors are optimistic and more willing to buy stock (such as IPOs) in riskier firms.

Lowry finds that investor sentiment significantly affects IPO volume, supporting the evidence in Lee, Shleifer, and Thaler [1991] and Rajan and Servaes [1997]. She also finds that capital demand is an important factor in IPO volume. One measure of investor sentiment used is the discount on closed-end funds (discussed earlier). Lowry reports a puzzle for why the discount on closed-end funds is not important for the three quarters leading up to the IPOs, but is important one year before.

This evidence is consistent with our hypothesis. As mood improves, both investors and private firm owners become more optimistic, which is quickly reflected in the stock market. IPO initial returns will be high during a time of increased optimism. However, it takes time for private firms to find an underwriter and go through the registration process with the Securities and Exchange Commission. Therefore, social mood improvements today can be measured in investor sentiment today. But the resulting IPO issues will experience a time lag.

Lowry and Schwert [2002] find that more firms go public after observing high initial IPO returns for other firms. The lag between initial IPO returns and IPO volume is just another illustration of how both are influenced by social mood, but one takes longer to implement. Also, since social mood affects both investors and managers, we expect the managers to be more optimistic about capital projects, as previously discussed. Therefore, we would also expect the demand for capital to be highly correlated with investor sentiment. Because the source of investor optimism and manager optimism is the same, we expect both variables to predict IPO volume.

Investor sentiment measures will quickly reflect social mood decreases. With increasing pessimism, private firm owners will also be more pessimistic and not as interested in going public. Indeed, if the social mood turns negative quickly, some IPOs in the registration process will be cancelled. Note the asymmetry. Private firms can cancel an IPO halfway through the registration process, but cannot enter the process halfway through. Therefore, IPO volume should increase gradually during times of optimism, and decline more quickly during times of pessimism (similar to the M&A wave).

This is illustrated in the charts of IPO volume in Figure 4. Panel A shows the number of IPOs each quarter from 1960 to 2002. IPO volume is shown in relation to the preceding twelve-month return on the S&P 500, and it does appear to be related to the most recent stock market trends. Higher stock market returns lead to higher IPO volume. The declines in IPO volume seem to be sharper than the increases.

Panel B of Figure 4 shows the monthly IPO volume in Japan in relation to the level of the Nikkei 225 Index. The evidence from Japan also appears consistent with the social mood hypothesis. Stock market level and IPO activity are both outcomes of the general level of social optimism/pessimism. In this case, IPO volume is highly correlated with the stock market level (0.84). Declines in IPO volume appear sharper than increases.

Entrepreneurs

Starting a new business is very risky. Cooper, Woo, and Dunkelberg [1988] summarize the failure rates computed in various studies. They conclude that 34% to 50% of new businesses fail within two years, and 50% to 71% fail within five years. Dunne, Roberts, and Samuelson [1988] estimated that nearly 62% of new entrants into manufacturing exited within five years. Nearly 80% exited within ten years. Yet, in the face of this high failure rate, entrepreneurs start more than 50,000 new businesses every month in the U.S.

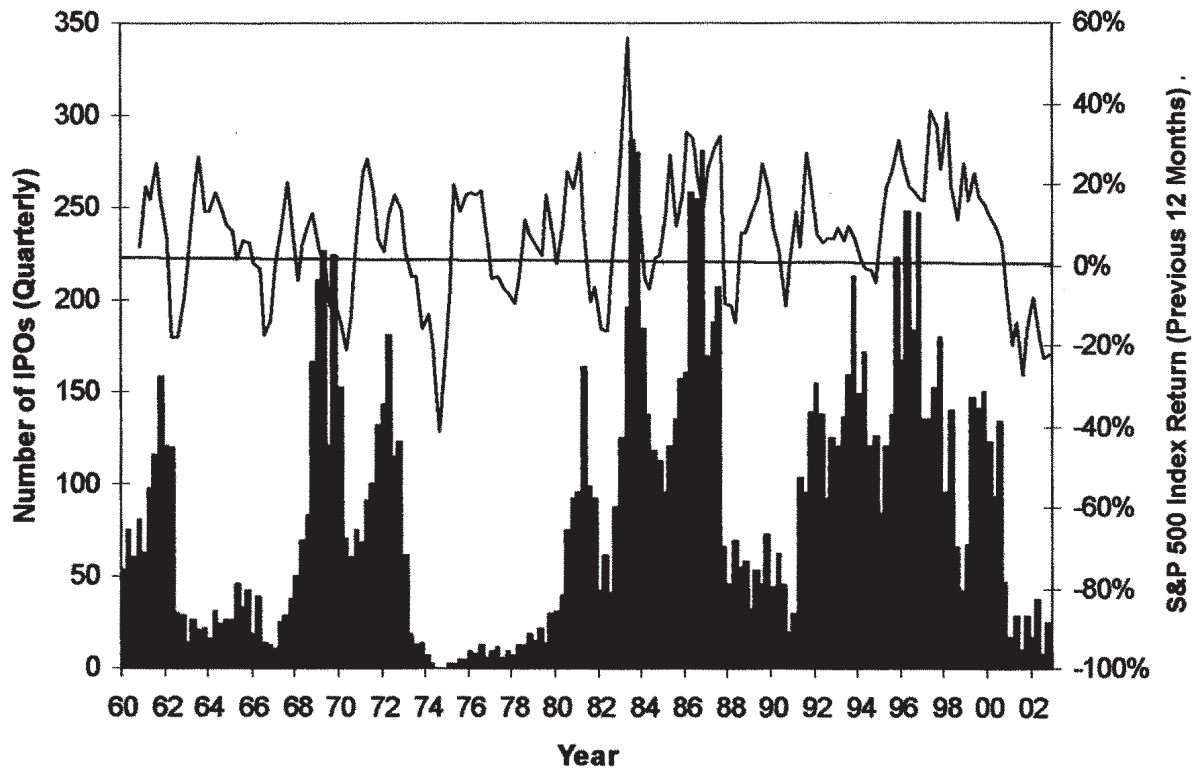
Camerer and Lovallo [1999] and Manove [2000] propose that overconfidence in relative ability is one explanation for the high amount of business starts and failures. Surveys of entrepreneurs also illustrate their high levels of optimism. Cooper, Woo, and Dunkelberg [1988] surveyed 2,994 people who had recently started a business. 81% believed their odds of success were 7 out of 10 or better, and 33% believed their odds of success were certain, 10 out of 10! There is obviously a stark contrast between entrepreneurs' beliefs and their real chances of success as measured by the failure rates cited above. This high level of optimism probably plays a big part in driving people to start new businesses.

The social mood hypothesis predicts that when social mood is high, more people are optimistic, and some of these people will start businesses. When social mood is low, more people are pessimistic, and fewer will have the confidence to start a business. Therefore, the number of business starts reflects the level of social mood.

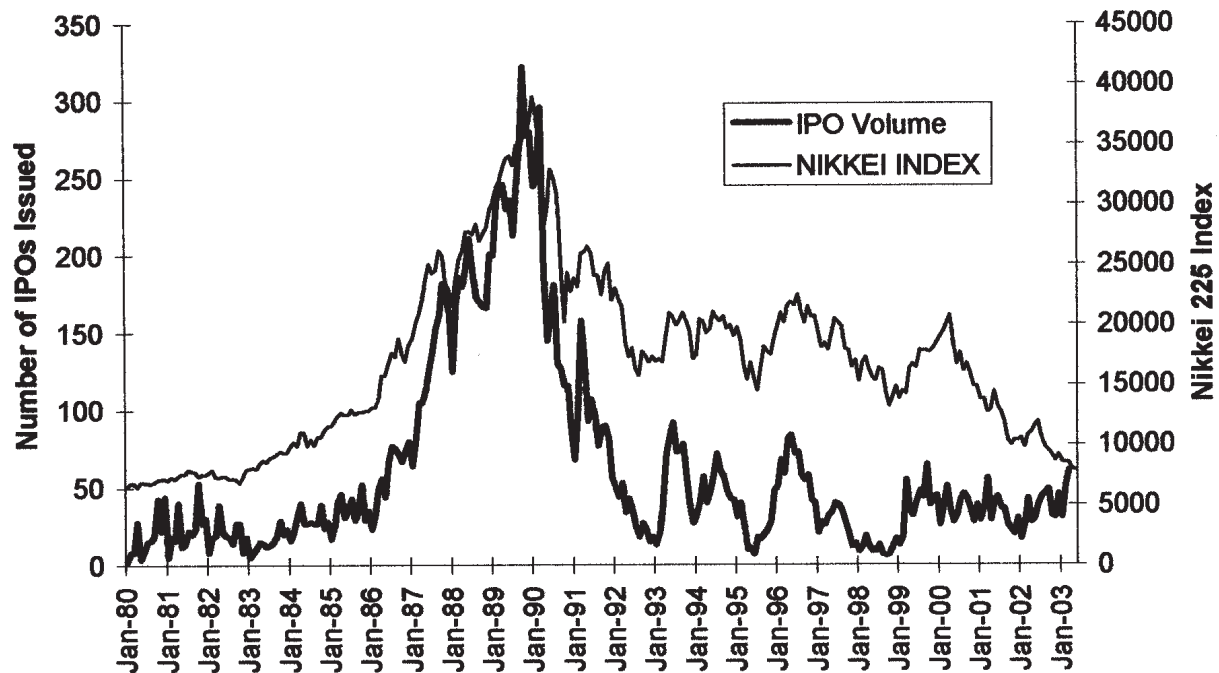
Theory Proposition in Corporate Finance

Previous papers on psychological bias and corporate finance mostly address cross-sectional issues. They examine the differences between investment ac-

FIGURE 4
Initial Public Offerings



Panel A. Number of IPOs Each Quarter in the U.S. versus the Previous Twelve-Month Return on the S&P 500 Index (source of IPO volume is Ritter's website)



Panel B. Number of IPOs Each Month in Japan versus the Nikkei 225 Index

tivity and capital structure between firms with and without optimistic and overconfident managers. However, our propositions are different. As social mood changes over time, the percentage of managers and people who are optimistic also changes. Using that perspective, the proposition of this paper is that periods of optimistic social mood should lead to more corporate investment, higher debt financing, more mergers, higher IPO volume, and increased new business starts. Periods of pessimistic social mood should produce lower levels of these economic activities. As social mood changes over time, the extent of corporate investment, debt offerings, M&A activity, equity offerings, and business starts should occur in correlated waves. There may also be lead/lag relationships between these activity measures because some of them take longer to implement.

The traditional rational expectations (RE) approach to finance may offer similar predictions. For example, RE predicts that the stock market will lead business activity because prices reflect the expectation of the activity. But this also implies lower volatility (Shiller [1981]) and greater market efficiency than is generally observed. Also, corporate managers may conduct more mergers and the M&A may occur in waves because of better economic fundamentals. However, the RE approach is inconsistent with the evidence that acquiring firms do not generally obtain value from mergers.

Summary and Predictions

Social interaction is an important aspect of the decision-making process. People obtain information and opinions about a decision by communicating with one another. Psychologists believe emotion is a particularly important factor in making decisions under risk and uncertainty because emotions interact with cognitive evaluation in the decision process. In some circumstances, such as when there is a high degree of complexity and uncertainty, emotions have a strong influence on the decision made. But emotions exogenous to the decision at hand can also influence the action chosen. The general optimistic/pessimistic mood of society is transmitted through social interaction, and in turn influences all types of decision-makers, including financial ones.

Increasing mood is associated with emotions like optimism, happiness, and hope. At the peak, these emotions become extreme, leading to extreme overconfidence, euphoria, and excess. A decreasing mood is associated with pessimism, conservatism, and suspicion. The lowest levels of social mood are associated with strong emotions like fear, stinginess, and antagonism. We argue that when social mood is high, many financial decision-makers are optimistic (consumers, investors, and executives). Therefore, biased financial

decisions tend to correlate across different types of financial decision-makers.

Social mood is most quickly propagated through investors to the stock market. Investor sentiment is impounded into stock prices. As a consequence, the stock market itself is a meter or register of social mood. The stock market reaches a high (low) when the social mood is high (low), and a rising (falling) stock market indicates an increasingly positive (negative) social mood trend.

Since the stock market is a measure of social mood, which influences economic activity, we are able to make more general economic predictions than the more narrow models of investor sentiment or corporate manager optimism. First, a rising (optimistic) mood is first measured by increases in stock market valuation. This rising mood influences 1) investors who seek higher-risk portfolios and increase trading, 2) consumers who spend more and take on more debt, and 3) business participants who increase their corporate investment, use more debt financing, conduct more mergers, take more firms public, and start more new businesses. The pro-business mood influences government as well. The government during high mood periods will be less likely to halt mergers and will conduct fewer antitrust activities. Congress may also be more likely to pass pro-business legislation. Many of these economic activities take time to complete, however. Thus, we may see a time lag between the rising stock market and the realization of this economic activity.

Second, declining stock valuation indicates a declining social mood. The pessimism and conflict associated with low levels of social mood cause more investor differences of opinion, higher market volatility, and a flight toward safer portfolios. Pessimistic consumers spend less and may concentrate more on paying down consumer debt. Business decision-makers spend less on capital projects, conduct less merger activity, issue fewer public offerings, and focus on cost-cutting rather than expansion. An anti-business environment is likely to arise and influence the government to pass investor protection legislation and attempt to protect consumers by initiating more anti-trust activities.

Third, since social mood changes over time, these investment and business activities occur in waves. The stock market changes quickly to reflect changes in social mood, but other financial actions take longer to unfold. For example, it will take time for the level of M&A activity and IPOs to increase. However, there is a shorter time lag between decreases in the stock market and decreases in business activity than in increases in mood and activity. This is because it is easier to stop mergers and public offerings than to initiate and complete them. So changes in the stock market lead business activity, but the time lag is asymmetric between increases and decreases in mood.

Fourth, extremely positive or negative social moods are associated with extreme behaviors. Emotions move to euphoria as social mood peaks, which can cause stock market bubbles. During this time, investors may be able to correctly evaluate that the market is overvalued, but their levels of optimism remain so high that they overcome reason, and investors continue to buy. The peaking mood fosters risk-seeking behavior and excesses. Consumers overextend themselves with credit, banks extend more generous terms, and businesses overinvest. As the euphoria wanes, social mood begins to decline and pessimism takes over. Lenders recall loans, corporate scandals are revealed, investors sell stocks, and companies lay off employees. The declining mood eventually bottoms. Many firms and people have declared bankruptcy, corporate investment is low, and unemployment is high. This sets the stage for the next rise in social mood and therefore the next business cycle.

Along with these predictions, it is appropriate to give a final comment on causality. A traditional rational expectations approach to the stock market and economic activity suggests that social events cause short- and long-term market reactions. For example, the legislative activities of the government influence the direction of the stock market.

However, the socionomic hypothesis proposes the opposite. A positive or negative social mood is quickly reflected in the stock market, and eventually determines the tone and character of legislation. The standard assumption of causality is backward. It is not the actions of the Fed that drive the market—it is social mood that drives the market and business activity, and ultimately causes the Fed to act. Investors are not upset *because* the stock market has dropped—the market has dropped because people are upset, and so on.

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Notes

1. Even the popularity of the analytical methods used (momentum, value, etc.) are subject to social mood.
2. Even if investors use the equation $g = (1 - \text{dividend payout ratio}) * \text{ROE}$ to estimate the growth rate, they must predict the future return on equity.
3. This analysis focuses only on a bias in estimating the growth rate. Overconfident people, however, tend to underestimate risk, while pessimists tend to overestimate risk. These biases would impact the estimation of the required rate of return k .

This bias works in the same direction as that of the growth rate and magnifies our argument.

4. For rational explanations based on economic fundamentals of the tulip, Mississippi, and South Sea bubbles, see Garber [1990].
5. Survey of Research Center, "Surveys of Consumers," University of Michigan, undated, <http://www.sca.isr.umich.edu/main.php>.
6. Social mood might be measured by the popularity of different types of songs, movies, or fashion styles if they could be easily quantified.
7. See also Montier [2002, Ch. 7] for a review of psychology and corporate finance.
8. Merger data come from Mergerstat (www.mergerstat.com).

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