



## Investor Sentiment and Stock Prices: Explaining the Ups and Downs

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Academics, traders and money managers are forever trying to figure out what makes stocks rise and fall. Some influences are clear, like the price gain after a company reports surprisingly strong earnings. But as experts drill deeper, other behaviors are mystifying. Why do shares of companies with fast asset growth sometimes do better than expected according to standard measures like earnings? And why do they sometimes do worse? What explains the price patterns of stocks that share special features like return on assets, rates of total accruals and rates of net stock issues?

For years, two theories have tried to explain such anomalies in stock returns. The first says that investors may have reached a keen understanding of hard-to-detect risks associated with these special features. If so, unusually large price gains would reflect a risk premium -- a larger gain to compensate for larger risks.

The second theory suggests that these unexpected gains and losses are a result of mispricing -- that is, when investors, for some reason, pay too much or too little for a stock relative to the stock's underlying fundamentals.

Now, new research by Wharton finance professor [Robert F. Stambaugh](#) and two colleagues has unearthed strong evidence for the mispricing theory, discovering that market-wide investor sentiment is a key influence. "Our study looks at investor sentiment as a potentially important source of mispricing," Stambaugh says. "In other words, when investor sentiment is high, do things get overpriced? And if they do, can we see evidence of that influence?"

Stambaugh and his colleagues -- Yu Yuan, a visiting professor at Wharton, and Jianfeng Yu of the Carlson School of Management at the University of Minnesota -- identified 11 features associated with stock price changes that defy easy explanation. One of these features (which the researchers refer to as "anomalies" in their paper) is a company's growth in assets like plant equipment, fleets of vehicles, property and inventories -- anything on the asset side of the balance sheet. Others include firms in financial distress, firms that issue new shares of stock, those with high accruals and those showing share-price momentum, as well as firms with gross profitability premium, and those distinguished by their return on assets and the ratio of investments to assets.

For instance, "companies that have grown their assets the most do, on average, produce lower subsequent returns on their stock, which presents a bit of a puzzle," Stambaugh says. If the risk-based theory were true, companies with high rates of asset growth must be seen by investors as less risky than companies with low rates of asset growth. Investors would therefore settle for lower returns -- a view that then is reflected in price changes.

But there is no obvious reason for investors to regard such firms as less risky, Stambaugh points out. "What gets this thing called an anomaly to begin with is that previous attempts by others to try to attribute these [price changes] to risks have not been successful."

If risk is not the explanation, "the obvious alternative is that somehow the market misprices these things." One potential cause? Investor sentiment -- a mood -- carries these stock prices up or down to a degree that cannot be explained by fundamentals like earnings and revenues.

### Barriers to Short Selling



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To examine this possibility, Stambaugh and his colleagues combined two concepts that researchers have investigated separately. "The first concept is that investor sentiment contains a market-wide component with the potential to influence prices on many securities in the same direction at the same time," they write in their paper, "[The Short of It: Investor Sentiment and Anomalies](#)," which was published in the May issue of the *Journal of Financial Economics*. This is what happens during bubbles, when investor exuberance pushes prices above the levels that can be justified by standard measures of value. A bust often follows, as pessimism drags prices too far down.

The second concept, according to the researchers, "is that impediments to short selling play a significant role in limiting the ability of rational traders to exploit overpricing." "It is not as easy to short as it is to go out and buy a stock," Stambaugh notes.

Combined, the two concepts suggest that when market sentiment is very positive, there are many overpriced stocks instead of just a few -- as would be the case if markets operated efficiently. In an efficient market, investors quickly spot stocks that are overpriced or underpriced, selling the former and buying the latter. The reduced demand for overpriced stocks drags prices down until those stocks are no longer overpriced, while higher demand for underpriced stocks pushes prices up, eliminating the underpricing.

But because it is harder to sell stocks short to bet on a price drop than it is to buy stocks to bet on a gain, stocks could be more likely to be overpriced when enthusiasm is high than to be underpriced when it is low. If this proved to be true, stocks' different price behavior following periods of high and low sentiment would show that investor sentiment is indeed a factor in pricing. Further, if the disparity could be detected in the stocks with anomalous pricing behavior, it would help explain why the anomalies happen.

Short selling is a trading technique for betting on a price drop. In effect, the investor borrows a block of shares from a securities firm and then sells them at the current price. If the price falls, the borrowed shares can be replaced with ones purchased for less, and the investor profits by having sold high and bought low.

But although the concept is simple, there are a number of impediments to betting on a price decline. Because the transaction involves a loan from a securities firm, the investor must set up a special account, which can require approvals and charges one does not encounter when simply buying a stock. In addition, many investors are reluctant to engage in short sales because these sales buck the market's general upward trend over time. Many institutional investors, including most mutual funds, are barred from short selling.

Many investors are also unwilling to face the theoretically unlimited losses risked by short sellers if prices rise instead of fall, since there is no limit to how high a stock's price can go.

In addition, Stambaugh notes, virtually anyone can buy stocks, or go long. One simply has to open an account and put in enough cash to meet the broker's account minimum and cover the price of any purchases. Thus, if a stock looks appealing, there are vast numbers of potential investors to create demand to drive the price up. But there are not as many investors available to bet on a price decline, because sales would be limited to those who either already own the stock or have overcome the impediments to short selling.

The upshot: It is easier for a wave of positive sentiment to drive the price up than for negative sentiment to drive it down, making overpricing more likely than underpricing.

"Investors with the most optimistic views about a stock, relative to the views of other investors, exert the greatest effect on the stock's price, because their views are not counterbalanced by the valuations of the relatively less optimistic investors," Stambaugh and his colleagues write. The Internet-stock bubble of the late 1990s was an example, Stambaugh says. The optimists drove prices too high, because it was difficult for pessimists to counterbalance the enthusiasm.

### **Debunking the 'Risk Story'**

To test their theory, Stambaugh and his colleagues examined the real-world behavior of stocks representing the 11 feature "anomalies" the researchers identified. In each group, the researchers isolated the 10% of stocks that performed best and the 10% that performed worst. For each stock, they looked at a

theoretical long-short investment strategy that purchased the high-performing stocks and shorted the low-performing ones. The results of this strategy were then studied in relation to the market's overall sentiment at the time, based on an existing gauge which uses key factors, including: closed-end fund discounts, first-day returns on initial public offerings, turnover among stocks listed on the New York Stock Exchange, the equity share in total new issues of stock and the dividend premium.

If optimistic sentiment is indeed a stronger force on prices than pessimistic sentiment, mispricing would be more likely during periods of strong positive sentiment. The short-sale side of the investment strategy should therefore be more profitable following periods of strong positive sentiment, because short selling is profitable when over-priced stocks fall to earth. Finally, profits on the long side of the strategy should be about the same regardless of investor sentiment, since the lack of impediments to stock purchases make underpricing unlikely. In other words, on the long side -- a bet that prices will rise -- prices are more likely to reflect fundamentals than sentiment.

"What we find is that these long-short spreads are much more profitable following high investor sentiment," Stambaugh reports. This is because short sales become very profitable due to overpricing from high sentiment.

By looking at the behavior of the 11 anomalous stocks from 1965 to 2008, the researchers found that the long-short strategy would have produced profits of 1.22% per month following periods of high sentiment, compared to just 0.52% following periods of low sentiment. The 70 basis point difference, or 70 cents for every \$100 invested in the long-short strategy, reflects the greater profit earned on short sales after periods of high sentiment pushed prices too high. Shorting is much less profitable after periods of low sentiment.

The results tease out the role of sentiment in the stock pricing anomalies. Among the firms with high asset growth, the effect was even stronger, with monthly gains of 1.18% following high sentiment, but only 0.13% after periods of low sentiment. However, the researchers note that their goal is not to "completely explain each of the anomalies considered.... We paint the set of anomalies with an intentionally broad brush, given our objective to consider the implications when market-wide sentiment interacts with short-sale impediments. Our objective is to explore the possibility that sentiment plays a pervasive role over time in affecting the degree of mispricing that arises in a broad range of specific contexts."

The research, Stambaugh says, should help to resolve the debate over the roles of risk and sentiment in explaining pricing anomalies. "It becomes much harder to tell the risk-based story after reading our work than before it."

Money managers may be able to use this new insight to tweak their long-short investing strategies, he adds. However, although it appears that investor sentiment is a key factor in these stock-pricing anomalies, it is not yet clear why sentiment has so much influence with firms that exhibit these particular features, Stambaugh and his coauthors write. "Certainly, more work lies ahead to develop a richer understanding of how sentiment plays a role in pricing financial assets."

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