
EDITORIAL COMMENTARY

A New Paradigm for Asset Pricing

The Old Paradigm

In 1970, Eugene Fama's seminal review entitled, "Efficient Capital Markets: A Review of Theory and Empirical Work" appeared in *The Journal of Finance*. The paper synthesized what were then revolutionary beliefs about security pricing and the operation of capital markets. The efficient market hypothesis (EMH) stated that prices reflect all there is to know about the security, because prices adjust rapidly to new information.

Earlier, another seminal paper, by William Sharpe, conjured up a model that described the pricing mechanism of capital assets, a model that was statistically testable. EMH and the capital asset pricing model (CAPM) of Sharpe were internally consistent, and opened a door for empirical validation of both the hypothesis and the pricing model. Adding to EMH's and CAPM's intellectual appeal were their foundation in logic and mathematics, especially the work of Markowitz on mean-variance efficiency and that of von Neumann and Morgenstern on game theory.

Thousands of research papers passed through this door in an attempt to determine the validity of both the hypothesis and the model. A large number of these empirical studies found that the theory couldn't be rejected based on the data available at the time. Yet, over time, numerous studies obtained "effects" that the CAPM could not explain, and which were inconsistent with EMH (that all relevant information is reflected in asset prices). These effects, as well as research that showed the lack of validity of Sharpe's model, were christened *anomalies*, a diminutive term that implies a tolerable aberration from a ruling belief system. Under the rubric of anomalies, the now well-documented effects, such as the January, the book/market, the size, the end-of-the-year, end-of-the-month, Monday, etc., effects were lumped together.

A New Paradigm

During the mid-1970s, a new view of asset pricing phenomena began to emerge. This view was based on research into value, or "contrarian" strategies, and the

pioneering work of Graham and Dodd and even John Maynard Keynes decades before. As the theory developed into the late 1970s and early 1980s, it began to systematically incorporate the growing field of cognitive psychology, including "prospect theory," which was developed by Kahneman and Tversky. This new "behavioral" or psychological view challenged the descriptive validity of expected utility maximization (including the axioms of von Neumann and Morgenstern) and argued that individuals' expectations must be formulated upon well-documented psychological factors. Accordingly, investors individually and together over- and underreact to both good and bad information. Several studies showed the statistical significance of over- and underreaction to new information.

Encouraged by the findings of these studies, and the logical consistency of this behavioral approach, *The Journal of Psychology and Financial Markets* has been established to promote the development of a new paradigm that takes into account the fact that people do not behave as gas molecules. Rather, individuals act according to contingencies that are imbued with their prior conditioning, both as individuals and as members of the society within which they exist. This journal will support and promote the exploration of these sociopsychological factors, including but not limited to such subjects as "expert error," perceptual change, ebullience, panic and trauma, group dynamics, and thought contagion.

We embark on the development of a new paradigm that is based on more realistic foundations than the old one, and thus aims to explain everything the old paradigm did, as well as all the things that it did not.

Overreaction in the Finance Literature

We begin our exploration of the new paradigm by examining the phenomenon of overreaction. Although the term "investor overreaction" is not new, probably no subject in the recent financial literature has generated more controversy than the question of whether investors overreact to price information. If overreaction exists, it would show that markets are

not completely efficient in how they react to the flow of new information.

Since the introduction of the term “overreaction” over two decades ago to describe systematic behavior, it has come to have a very broad meaning and now seems to be a catchall explanation of market “anomalies.”¹ Consequently, there appear to be as many definitions of overreaction as there are opinions as to its cause.

Sanjoy Basu [1978] put forth a mispricing hypothesis, a precursor to the overreaction hypothesis, concerning superior returns of low P/E stocks and inferior returns of high P/E stocks. According to Basu, “As a result of inappropriate responses to information, the market’s initial reaction to securities trading at different multiples of earnings is believed to be exaggerated; thus, it is eventually followed by a corrective price movement” This version of the hypothesis, although limited in its scope to the inclusion of low P/E stocks, is consistent with more recent hypotheses.

Dreman [1979] posits a statistically testable hypothesis based on psychological factors, arguing that investors react to events in a predictable fashion: They consistently overvalue the prospects of the “best” investments and undervalue those of the “worst.” They extrapolate positive or negative outlooks well into the future, pushing prices of favored stocks to excessive premiums and out-of-favor stocks to discounts. Similar reactions are found with high-yield bonds (Hickman [1958]; Atkinson [1967]), and stocks reporting disappointing earnings.² In all of these studies, the out-of-favor investments consistently outperformed their respective peer groups.

The explanation for this phenomenon follows from the hypothesis that the mispricing is based on investor perceptions. For example, Dreman and Berry [1995] (DB) hypothesize that if a stock is out of favor, negative news causes little or no change in perception, and therefore has little effect on the stock’s price. Positive news, on the other hand, does initiate a change in perception, sending the stock’s price higher. Good and bad news would affect “best” stocks in the opposite way: Good news would be taken for granted, while bad news would send the stock plummeting (referred to as the much-feared “earnings torpedo”). The relative amounts of good and bad news would be about equal for both the “best” and the “worst” stocks,³ but the net effect of surprises is that the “worst” stocks outperform the market and the “best” stocks underperform. DB provide evidence that the “earnings surprise hypothesis” is valid.

Overreaction in the Finance Literature: Value Strategies

Value strategies have a rich history in the literature of overreaction. Early work by Nicholson [1960,

1968] showed that stocks with low price-earnings ratios beat the market. His results were subsequently corroborated by McWilliams [1966], Miller and Widman [1966], and Breen [1968]. Basu [1977, 1978, 1983] brought the work to a new level of analytical sophistication.

DB updated the original overreaction hypothesis to include six predictable recurring events brought on by overreaction.⁴ According to their hypothesis, the overreaction occurs before the portfolios of the “best” and the “worst” are formed. Nevertheless, the effects of the overreaction can be measured after the portfolios are formed. In the specific case of out-of-favor stocks (measured by low P/E), the “best” (high P/E) and “worst” (low P/E) stocks have an asymmetric response to earnings surprises (as noted above). On average, surprises as a whole send low P/E stocks sharply higher and high P/E stocks sharply lower relative to the market. Dreman [1998] and Dreman and Lufkin [1997] subsequently show the effects of overreaction by three other valuation methods—low price-to-book, low price-to-cash flow, and high-yield.

Contrarian strategies became headline news in the academic press with the publication of works by Fama and French [1992] and Lakonishok, Shleifer, and Vishny [1994]. Fama and French [1992] show that at least two value strategies—low price-to-book value and low P/E—outperformed the market significantly during the 1963–1990 period. At the same time, they found that beta, the traditional measure of risk for almost three decades, had no predictive power to explain returns on common stocks. Lakonishok, Shleifer, and Vishny [1994] expand on previous work on contrarian strategies, exploring a number of measures of fundamental value. Other researchers have also noted the superior returns of low P/E and similar strategies (e.g., Fuller, Huberts, and Levinson [1993]; Downen and Bowman [1986]). Although the explanation of this effect is not generally agreed upon, its existence is usually accepted.

Overreaction in the Finance Literature: Winners and Losers

De Bondt and Thaler [1985, 1987] made seminal contributions to the overreaction hypothesis. They posited that “loser” stocks (those with the worst prior three-year returns) would outperform past “winners” (those with the best prior three-year returns). Their work rests on the reasoning that, “If stock prices systematically overshoot, then their reversal should be predictable from past data alone.”⁵ Thus, it seems plausible that one can isolate those stocks that have been driven down too far by simply choosing the stocks that have been driven down the farthest, and then looking to see if they bounce back up appreciably in the subse-

quent period. Their statistical findings show that stocks underperforming in one period usually outperform the market in the next. The more extreme the price movement in one direction, the greater the subsequent adjustment should be.

De Bondt and Thaler's work regarding winners and losers has been supplemented by a number of others. Brown and Harlow [1988], for example, conducted an event study that supported De Bondt and Thaler's work, with the additional observation that the duration and direction of past returns are important in predicting the size of the subsequent market reaction. Chopra, Lakonishok, and Ritter [1992] and Loughran and Ritter [1996] also provide support for this finding.

Overreaction in the Finance Literature: Initial Public Offerings

Investor overreaction has been observed in other contexts as well. A common illustrative example is initial public offerings (IPOs). Loughran and Ritter [1995] (see also Ritter [1991]) studied 4,753 IPOs in the 1970–1990 period and find that IPO prices ran up too far on the first day of trading. The average compound return for the subsequent five years was 15.7%, compared to 66.4% for a set of matching firms (firms with similar market values that did not issue new stock during the period). As poor as this performance was, though, it was skewed upward by a minority of companies posting spectacular results.⁶ The median IPO return during the same period was a 39% loss in value.

Loughran and Ritter [1995, 1997] find similar results for 1,416 firms making seasoned, or “secondary,” equity offerings (SEOs) during the 1979–1989 period. They note that firms most often make secondary offerings after a period of exceptional operating performance, but that their profitability declines significantly thereafter. The average one-year return prior to the offering is 90%, while the average five-year return following the issue is 42%. This compares to 116% for matching firms. The effect is most pronounced for firms in the smallest market size quartile, whose one-year prior return is 108%, followed by a –4.7% five-year return. The results for both IPOs and SEOs are most readily explained by investors' unrealistically high expectations for firms making stock offerings.

A number of researchers (Loughran and Ritter [1997]; Daniel, Hirshleifer, and Subrahmanyam [1998], and references therein) infer that management frequently recognizes when the market overvalues the firm's prospects and chooses to issue stock at those times.

Overreaction in the Finance Literature: Bubbles and Crashes in Experimental Settings

Experimental asset markets (Smith [1994]) provide a controlled setting in which to observe market volatility, particularly bubbles and crashes. One example is a “market laboratory,” where subjects are given a starting amount of cash and securities and allowed to trade through a double auction,⁷ which is similar to those used on real-world exchanges. The traded securities pay a known average dividend and trading takes place over a set number of time periods. Repeated experiments (Smith, Suchanek, and Williams [1988]; Smith [1992]; Porter and Smith [1994]; Caginalp, Porter, and Smith [1999]) show that investors generally run prices up too high, and that this run-up is positively correlated with the amount of excess cash available. A period of overvaluation ensues, after which the participants finally realize the price has exceeded the expected value of future dividends, bringing about an abrupt drop in prices. Participants learn with experience: They price assets closer to fundamental values in repeated experiments. Bubbles and crashes are created, nevertheless, even though a highly simplified situation is created in the laboratory, so that a fundamental value is a known quantity. Complexity and uncertainty are, obviously, many orders of magnitude greater in real-world markets.

Overreaction in the Finance Literature: Study Criticisms

Previous studies of both value strategies and winners and losers have generated considerable controversy on the grounds of methods of analysis. Some of the critics argue that studies documenting overreaction are subject to faulty methods (e.g., Banz and Breen [1986]; Conrad and Kaul [1993]; Ball and Kothari [1989]). Others argue that value strategies beat the market, therefore “they must be risky because markets are efficient” (e.g., Ball [1978]; Fama and French [1995], see more on risk below). Reinganum [1981] and others state that low P/E stocks outperform the market because they are, in reality, small-capitalization stocks (Banz [1981] and others have concluded that small-capitalization stocks outperform the market over time).

However, value strategies have survived despite the criticisms. By the early 1990s, work by a number of authors (e.g., Fama and French [1992]; Lakonishok, Shleifer, and Vishny [1994]; Fuller, Huberts, and Levinson [1993]; and others) had shown that contrarian effects are robust to a wide variety of methods of analysis and data selection criteria. Making corrections for possible survivorship

bias, measurement methods ranging from regression analysis to long-term portfolio buy-and-hold calculations to studying a wide variety of data sets over different time periods have all yielded the same qualitative results.

Moreover, many of the criticisms of findings supporting a winner/loser effect (e.g., De Bondt and Thaler [1985, 1987]) have been effectively refuted. For example, Chopra, Lakonishok, and Ritter [1992] and Loughran and Ritter [1996] answered a number of the critics of De Bondt and Thaler and showed that the winner/loser effect is robust to a number of factors, including risk and firm size.⁸

Finally, the position that contrarian effects are really small-stock effects, although still quoted frequently, appears quite indefensible in light of recent findings. Many researchers have noted superior returns to contrarian stocks after controlling for firm size (Basu [1983]; Dreman [1990]; Lakonishok et al. [1994]; Fama and French [1992]), while the small-firm effect itself has come under overwhelming attack in recent years (Dreman [1998, chapter 15]; Horowitz, Loughran, and Savin [1999]; Knez and Ready [1997]).⁹ Dreman [1998, ch. 15; 1990], for instance, shows that a strong contrarian effect exists at five separate levels of market value, from stocks in the over \$5 billion range down to microcaps. Perhaps most importantly, contrarian stocks, as noted above, are not small stocks. Small stocks are known to be riskier than large stocks and to have lower dividend yields, which further highlights the fundamental distinction between the two types of investments.

Overreaction in the Finance Literature: The Underreaction Challenge

Further confusion has arisen from many event studies, which have found evidence for underreaction, not overreaction. In essence, underreaction occurs when market participants react to news slowly (weeks, months, even years) and/or insufficiently. By contrast, the efficient market hypothesis states that markets should adjust to new information quickly and correctly. In modern domestic financial markets, stock prices can move in a matter of hours or minutes in response to new information. Thus, as with overreaction studies (in which the market's adjustments are too extreme), underreaction studies show that there are many cases in which investors react too little and too slowly.

Principal among these are the observations of Abarbanell and Bernard [1992] (AB) and Bernard and Thomas [1990] that analysts apparently underreact to earnings announcements. Analysts continue to overes-

timate (underestimate) corporate quarterly earnings after a positive (negative) earnings surprise, for as long as three or four quarters after the initial earnings announcement, rather than adjusting their estimates immediately.

Another example is the work of Michaely, Thaler, and Womack [1995], who find that the price response following dividend cuts and initiations continues for two years or more. They find that firms initiating dividends outperform the market by 7.5% in the first year, while those omitting dividends underperform by 11.0% over the same period.

Ikenberry, Lakonishok, and Vermaelen [1995] document that investors underreact to firms' share repurchases by failing to recognize management's knowledge of positive future returns. Using a sample of 1,239 share repurchases from 1980 to 1990, the authors find an excess return of 12.6% over the subsequent four years.

Even stock splits result in prolonged stock price movements or underreaction. Splits have long been believed to contain no relevant pricing information, and therefore to have no impact on stock prices after the split is announced. Fama et al. [1969], for example, in what has come to be regarded as the original event study, measured the returns following 940 stock splits from 1927 through 1959 and concluded that after the split date there were no abnormal returns.¹⁰ However, more recent work by Ikenberry, Rankine, and Stice [1996] finds that there is a significant difference in returns between splitting and non-splitting firms, amounting to 12% over three years. They interpret this result as the manifestation of insider knowledge of future prospects to split, and that investors are slow to take account of it (underreact).

Overreaction inevitably takes the form of mispricing, whose effects can be directly measured for groups of over- and undervalued stocks. In the case of contrarian strategies, at least, these effects have been measured repeatedly, as noted above. Moreover, overreaction need not be tied to events at all. Perceptual change can be both gradual and non-linear. Group effects, for example, can cause changes in perception with no changes in fundamentals. This is not meant as a criticism of previous work. Rather, it is to point out that because psychological processes can be almost impossible to pinpoint in time, detecting even blatant overreaction can be difficult.

DB point out that, while their results indicate overreaction in the period before portfolios of favored and unfavored stocks were formed, they also observe underreaction—a slow correction price after portfolio formation that continued for at least five years. This underreaction was also consistent with that observed by Abarbanell and Bernard [1992].

Conclusion

Our brief overview provides strong evidence that overreaction does occur, often in a systematic and predictable manner. These findings are anything but arcane theory. The concept that investors never overreact, and always behave rationally, has led to major investor errors over the decades, including the loss of \$1 trillion in the 1987 Crash. Moreover, it is one of the important reasons why the Federal Reserve today has not taken a more active role in attempting to cool off speculation in some sections of the market. If investors are rational, after all, prices are where they should be.

The goals of this journal are thus multifaceted. First, the editors will strive to publish research that provides more realistic explanations of how markets actually work. Our examination of overreaction is meant to show a concrete example of this new exploration. The new research in this journal will look to psychological, anthropological, and other research within the social sciences to explain deviations from the efficient market paradigm.

Second, this research promises to hold major implications for the investment decisions of both professional and individual investors alike. The low odds of success over time in buying initial public offerings; or paying too dearly for Internet or other popular stocks of the day; or of relying too heavily on analyst forecasts, which have been shown to be both far off the mark and consistently optimistic, are just three examples of how understanding the psychology of investor decision-making can prove enormously helpful to investors in managing their portfolios.

It is the overriding goal of this journal to encourage new research that will provide both theoreticians and practitioners with a more realistic model of how investor decisions are actually made, and how they impact the markets.

Notes

1. "Anomaly" in finance usually refers to any phenomenon that cannot be explained by the efficient market hypothesis.
2. November 1968 report, Marine Midland Bank. See Dreman [1982, p. 168].
3. DB show that low and high P/E stocks have about the same size and number of positive and negative surprises. Thus, positive and negative surprises themselves favor neither low P/E nor high P/E stocks.
4. The investor overreaction hypothesis makes these predictions (see Dreman and Berry [1995]):
 1. The "best" stocks underperform the market, while the "worst" stocks outperform, for long periods.
 2. Positive surprises boost the "worst" stocks significantly more than they do the "best" stocks.
 3. Negative surprises knock the "best" stocks down much more than the "worst" stocks.
 4. There are two distinct categories of surprise: *event triggers* (positive surprises on the "worst" stocks, and nega-

tive surprises on the "best"), and *reinforcing events* (negative surprises on the "worst" stocks and positive surprises on the "best"). *Event triggers* result in much larger price movements than *reinforcing events*.

5. The differences are significant only in the extreme quintiles, with a minimal impact on the 60% of stocks in the middle.
6. Overreaction occurs before the announcement of an earnings or other surprise. A correction of the previous overreaction occurs after the surprise. The "best" stocks move lower relative to the market, while the "worst" stocks move higher, for a relatively long time following a surprise.

DB demonstrate that all six predictions of the investor overreaction hypothesis have been confirmed to a high level of statistical probability.

5. De Bondt and Thaler [1985, p. 795].
6. And also because the researchers limited the initial IPOs to over \$2. The IPOs under \$2 did much worse.
7. A double auction matches simultaneous bids (prices buyers are willing to pay) and offers (prices at which holders are willing to sell).
8. However, there remains the problem that studies of winners and losers have included very small firms, for which liquidity could be a complicating factor.
9. New research shows that small stocks have been almost completely illiquid during the (sporadic) times they supposedly provided the best returns — the early 1930s and early 1940s (Dreman [1998]) and the late 1970s (Horowitz, Loughran, and Savin [1999]). The returns were eaten up in the bid-ask spread or came from penny stocks that could not be bought without driving up the price considerably. Knez and Ready [1997] show further that the size effect is not robust to outliers in regression tests, but that book-to-market is robust. This effectively refutes Fama and French's [1996] three-factor model, further undermining the appeal to risk.

But perhaps most damning is the financial equivalent of "where's the beef?" In 1981, proponents of the then-newly discovered small-cap effect launched Dimensional Fund Advisors' 9-10 Small Cap Fund (the ninth and tenth deciles of firm size on the New York Stock Exchange, also including Nasdaq firms in the same size range). At the time, the small-firm effect was presented as "another ingenious idea" the researchers were "sure cannot fail." One of them claimed they were "plugged into the academic world, where all the real good [sic] research is taking place. We have a kind of tie-in to Mecca" (*Forbes*, December 21, 1981). Since its inception, the fund's absolute compounded return to year-end 1998 was 757%, compared to 1,659% for the S&P 500, a shortfall of two to one.

10. They concede that the split announcement date, which usually occurs two to four months before the effective date, is the correct date from which to measure the returns. They did this with a subsample of the data and found essentially the same results.

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