



SOCIETY OF ACTUARIES

Article from:

Risks and Rewards Newsletter

October 2003 – Issue No. 43



RISKS AND REWARDS

THE NEWSLETTER OF THE
INVESTMENT SECTION

PUBLISHED IN SCHAUMBURG, ILL.
BY THE SOCIETY OF ACTUARIES

Behavioral Finance

by Douglas A. George

My actuarial training and work experience have provided me with broad exposure to the Efficient Markets Hypothesis (EMH). Some fundamental premises of EMH are that market prices reflect all available information; that prices move in a random manner, with no discernable pattern or trend; and that investors act in a completely rational manner, always maximizing expected utility.

The implications are significant. If markets are truly efficient, then attempting to outperform them is futile. For example, any information you have which may cause you to believe a given security's price will move up or down, is already completely and fairly reflected in the current price of the security. Thus, attempting to outperform the market is a game of chance rather than skill.

However, some observers argue that the empirical data do not support the Efficient Markets Hypothesis. They claim that there are anomalies in price movements that cannot be explained through EMH. Because of these perceived shortcomings, a new approach to explaining financial markets has recently emerged known as behavioral finance.

What is Behavioral Finance?

Behavioral finance does not attempt to supplement standard finance; it attempts to replace it. It presents a financial paradigm in which some agents do not act in a rational manner. It is based on the observance of ways in which people systematically depart from optimal judgment and decision-making. It links behavioral cognitive psychology (the study of human decision making) with financial market economics, emphasizing how investor behavior leads to various market anomalies. It takes into account human emotion and cognitive error in explaining how investors make financial decisions. It argues that these behaviors cause departures from rational decision-making, that these departures are systematic and that they affect prices in the financial markets.

If true, behavioral finance offers tremendous potential value to our profession. An understanding of why we make investment decisions the way we do, and the flaws that we have, can lead to better decisions on behalf of our employers and clients. Further, to the extent that the flaws discovered through this analysis are consistent and predictable in the markets, they would offer investment opportunities that can be exploited¹.

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1) Studies supporting behavioral finance focus on equity markets. Some parallels may exist in debt markets, especially lower quality debt, which tends to behave more like equity.

On the other side of the house, can we use behavioral finance to better understand our customers/policyholders? If so, we could design products and features that are more appealing to them and increase our profitability. Many of the behavioral models we currently use in our risk analyses assume that policyholders act in a truly rational manner, exercising options to maximize their economic benefit. How many of us believe that they really act in this manner?

The Observations

Behavioral finance has observed and studied dozens of investor behaviors that present potential anomalies to the Efficient Markets Hypothesis. Here are a few:

Overconfidence: A number of studies show that people are overconfident in their judgments. For example, the confidence intervals that people place on their estimates are too broad. One study showed that the 98 percent confidence intervals placed on predications for the Dow at the year-end include the correct value only 60 percent of the time [Alpert and Raiffa (1982)]. Another showed that events that people think are virtually certain occur only 80 percent of the time, and others that are predicted to be impossible occur 20 percent of the time [Fischhoff, Slovic and Lichtenstein (1977)]. Overconfidence can lead to poor investment decisions. Think: Orange County, Long Term Capital, Confederation Life, Conseco....

Self-Attribution Bias (a.k.a. Accumulating Pride and Shunning Regret) is related to, and possibly a cause of, overconfidence. It refers to the tendency to attribute any success a person has to his own talent (i.e. “accumulating pride”), while attributing failure to bad luck or victimization (i.e. “shunning regret”—Regret is

the pain we feel when we realize we would have been better off if we had not taken a course of action in the past). Behaviorists believe that markets are driven, not by greed and fear, but by the desire to accumulate pride and shun regret. One study showed investors can become overconfident due to the self-attribution bias after only a few periods of successful investing [Gervais and Odean (2001)].

Accumulating pride and shunning regret can be good for people in general because it motivates them

to keep trying after a failure, but it is not necessarily good for investors. Investors tend to sell winners too soon (to achieve pride) and hold on to losers too long (to avoid regret). They seem to want to believe that their losers will bounce back, perhaps when the rest of the market realizes what they “know.” In addition, overconfidence prompts people to trade too often, believing they have some advantage over the market. [Barber, Odean (1999)]. Think: Day traders.

Gender also plays a role. One study has found that men trade 45 percent more than women and perform 1.4 percent worse annually [Barber, Odean]. Why? Men are more overconfident than women.

Optimism/Wishful Thinking: Over 90 percent of people surveyed believe they are above average in their driving skills, their ability to get along with people and in their sense of humor [Weinstein (1980)]. They also predict that tasks will be completed much sooner than they actually are [Buehler, Griffin and Ross (1994)]. Think: How often do your staff members perform a task in less time than they tell you it will take? How often does it take longer?

Sample Size Neglect: When people do not know the data-generating process, they will infer it too quickly based on only a few data points. The belief that a small sample will reflect the properties of the overall population has been called “the law of small numbers” [Rabin (2002)].

Belief Perseverance: Once people form an opinion, they tend to stick with it too long. They do not want to look for information that might contradict their belief, and if they find any, they tend to dismiss it. [Lord, Ross and Lepper (1979)]. Think: What is the reaction when you challenge a colleague on one of his conclusions? **Confirmation Bias** goes one step further in that when people find information that opposes their conclusion, they misapply it or choose only fragments of it so that it supports their position instead.

Anchoring: When people form estimates they start with an initial value, which may have no relevance, and then adjust it to yield their answer. The adjustments are usually insufficient [Slovic and Lichtenstein (1971)]. Therefore, different starting points yield different estimates. In the markets, there is evidence that current prices can be anchored to prices in the past, so that prices do not fully adjust to certain fundamental changes. Think: A common negotiation strategy when undertaking a sale

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(purchase) is to start with the highest (lowest) price and adjust from there so that you get the best price possible. For example, when you buy a car, the dealer wants to start with the sticker price and work down and you want to start with the dealer's invoice and work up.

Myopic Loss Aversion: People feel the pain of loss more than the joy of gain. Thus, they exert more effort to avoid pain than to achieve gain. Normal people hate losses roughly two and one-half times as much as they like gains. Further, if one piece of their portfolio went up and another went down, but the portfolio in total did well, they will still feel the pain of the portion that dropped [Thaler, Tversky, Kahneman and Schwartz (1997)].

Prediction Addiction: If you show people a series of anything—numbers, colors, shapes, letters—and suggest that the sequence is random, they will insist on believing they can predict the next item in the series. At least one study has shown that the tendency to find these “patterns” is so powerful, that it happens subconsciously [Zweig (2002)]. In regard to markets, “every professional thinks he can forecast where the markets are headed, but at heart, all of us know these things are essentially unpredictable.” Think: How many of us do NOT have a rough prediction for market index levels at year-end?

The above-referenced article goes further to explain how evolution is responsible for many of the behaviors listed here. “The human brain is a superb machine when it comes to solving ancient problems like short-term trends or generating emotional responses with lightning speed, but it's not so good at discerning long-term patterns or focusing on many factors at once.” For example, panic can be a good reaction. For prehistoric man, reacting quickly to danger was a matter of life or death, *e.g.* an attack by a wild animal. Underestimating a real risk could be deadly, while overreacting did no harm. Of course, panic is not always a good reaction. Panicking as an investor can cause you to sell at a market low.

There are many more. **Hindsight Bias** is the belief, after an event has occurred, to think that we knew it was going to happen beforehand (contributes to overconfidence). **Framing** is reaching a conclusion based on the “framework” within which a situation was presented, *e.g.* people are more likely to agree to a new technique if it is described as “having a 50 percent success rate,” rather than “having a 50 percent failure rate.” **Persuasion Effect** refers to being persuaded more by a (perceived) credible source than

by a credible argument. **Illusion of Control** refers to a belief that an individual has more control over events than he really has. The list goes on.

How does it all work?

Let's take an example. It is common knowledge that the average equity investor tends to buy high and sell low. There are a number of studies that confirm this. We see this behavior in stocks, mutual funds and in our variable annuity customers. It's amazing to me how many people I know, who in early 2000, were throwing money at the stock market (with the S&P 500 at 1500), and who have pulled their money out over the last year and a half (with the S&P 500 at 800 or 900). Why?

The efficient markets hypothesis provides no clue. These actions do not appear to be rational. Certainly there is much less risk with the S&P at 900 than at 1500. If the market moves in a random walk then why not buy now, rather than sell?

Behavioral finance might offer the following explanation. The market has been bearish for the last couple of years. **Loss Aversion** causes an investor to feel the extreme pain of his losses over that time. Even if he had great years before the bear market, he feels the pain at 2.5 times the enjoyment of the previous gain. He regrets the decision to stay in the market, but shuns it. If only he hadn't listened to his stockbroker (or his financial advisor or his brother-in-law).

Prediction Addiction causes an investor to believe that stocks will continue to drop. He sees a short-term historical pattern and projects it forward even though there is no logical basis for doing so. He believes stocks will continue to fall. **Loss Aversion** reemphasizes this belief because he imagines the market dropping another 10 percent, another 20 percent—he desperately wants to avoid further pain. **Overconfidence** kicks in. He knows he can fix it. He sells his mutual funds and surrenders his annuity.

He's out of the market until the market shows him that it is going back up, *i.e.*, after it's risen enough over a given time period (he needs to see the

The human brain is a superb machine when it comes to solving ancient problems like short-term trends or generating emotional responses with lightning speed...

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new pattern—the **Prediction Addiction**). Of course, by this time, he will have missed a good portion of the new bull market.

Where next ?

Can we use behavioral finance to better understand how we make investment decisions so that we can make them better? Can we spot situations in the market where one of the anomalies is at play and then exploit it? Can we better understand, and better model, the behaviors of our customers/ investors/ policyholders to our advantage? The jury is still out.

At least one researcher claims there is evidence to show that investor overreaction to information (e.g., prices moving too much) can be as common as under-reaction (e.g. prices moving too little). [Fama (1997). Note: Fama is largely credited with the development and rise in popularity of EMH in the 1960s]. If this is true, then the anomalies can be considered to be simply chance events, and the efficient markets hypothesis cannot be rejected. Fama also argues that the apparent anomalies can disappear when the measuring techniques change.

But—behavioral finance is in its infancy. Arguably, it was born only about 20 years ago, with a good deal of the progress made over only the last few years. It's hard to say where it goes from here. It certainly cannot currently claim to replace the Efficient Markets Hypothesis, but if current momentum continues, the possibility exists.

Special Thanks

This is my last column as chair of the Investment Section for 2003. I owe a debt of gratitude to a number of people who have helped with the all of the work performed by the section over the course of the year. The Investment Section Council has performed admirably, with each member pitching in to share in the workload. They are: Mark Bursinger, Craig Fowler, Charles Gilbert, Larry Rubin, Steve Easson, Mike O'Conner, Joe Koltisko and Bryan Boudreau. There are roughly 40 "roles" required of our council, including: seminar coordination; SOA meeting session planning; research project oversight; liaison, committee and task force delegates; and officer positions. I am lucky to have nine conscientious council members, each doing his part.

In addition, I need to thank Valentina Isakina, our SOA staff actuary, and Lois Chinnock, our SOA staff liaison. I'd be lost without both of you. Finally, thanks to our *Risk & Rewards* editors, Dick Wendt,

Nino Boezio and Joe Koltisko for yet another successful year for our newsletter. ☺

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