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Why Smart Traders Do Dumb Things: Understanding Prospect Theory

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If traders followed the numbers exactly as they should, then perhaps the market would be efficient. But traders can let their fears get the best of them.

There is an old joke that goes like this. Davey leaves for the University of Michigan, and a few days after he gets there he sends his parents a telegram (it's a very old joke), writing, "Mom, Dad, I lost all my money playing cards last night... you must send \$500 immediately." Davey's father is furious. He reads the brief note out loud in a snide voice, and snaps at his wife, "Can you believe the nerve of that kid?" The mother says, "You're not reading it properly." She takes the letter from her husband and slowly recites the single line in a sad, understanding, motherly tone. Immediately, her husband's eyes fill with tears and he says, "Well, if he asks like that, of course I'll send the money!"

While this is neither a good joke nor an easy one to put on paper, it does make an important point. How an issue is framed almost always determines the manner in which we perceive that issue. Moreover, we often structure information flow in such a way that a specific response can be virtually assured, or an otherwise obvious conclusion can be avoided. We've all encountered these types of phrases: I have good news and bad news... So, how often do you beat your dog?... I did not have sex with that woman...I am sorry if you were offended by my remarks, etc. What any of these statements ultimately mean to us is a matter of perception, and how we react to them is determined largely by how we feel about what we have heard.

Most people, frankly, are too lazy-minded to seek absolute clarity, and often respond to a stimulus without fully considering all of the facts. Consider the following problem posed by Daniel Kahneman, the winner of the 2002 Nobel Prize in Economic Sciences: A bat and ball cost \$1.10 in total. The bat costs \$1 more than the ball. How much does the ball cost? More than half of a group of students at Princeton and the University of Michigan who were asked this question, answered "10 cents." (It is not known whether Davey was among them; the poor kid had a lot on his mind.) The right answer, however, is that the ball costs a nickel. How could so many presumably smart students make such an obvious error? Kahneman concludes that "people are not accustomed to thinking hard and are often content to trust a plausible judgment that comes quickly to mind."

This pathology is at the center of some of the most important work ever conducted in the field of economics, and it is directly relevant to those who are active traders. Yet Kahneman's seminal research – with his partner,

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the late Amos Tverski – is vastly different from that of other contemporary Nobel Prize winners in Economics such as Milton Friedman, Merton Miller, Franco Modigliani, Myron Scholes, Robert Merton, Harry Markowitz and Bill Sharpe. Their work spanned a wide variety of topics, but a common element among them was the desire to understand how markets function. By contrast, Kahneman and Tverski were trained as psychologists, and their primary interest was in understanding how the human mind processes decisions, particularly with respect to the management of uncertainty.

Fear and the “Efficient” Market

In the course of their studies, they discovered that when it comes to taking risks, the human mind often behaves in an illogical manner and that individuals do not necessarily make the decision that optimizes their self-interest. For many economists, schooled since Econ 101 to believe in Adam Smith’s “invisible hand,” the one guiding rational beings to do only that which will benefit them most, this was a revelation. With their discoveries, Kahneman and Tverski energized an emerging field in economics called behavioral finance. Its proponents are worthy adversaries for the efficient market theorists who insist that the market is completely random and, therefore, unpredictable. Behavioral economists are equally sure that the market cannot be completely efficient, because people act irrationally when they are afraid.

In an interview he gave shortly after winning the Nobel Prize, Kahneman was asked to comment on the manner in which fear influences the decision-making process. He said, “What actually happens with fear is that probability doesn’t matter very much. That is, once I have raised the possibility of something terrible happening to your child, even though the possibility is remote, you may find it difficult to think of anything else.”

While this seems axiomatic, like many important principles in science, it had little credence until Kahneman, Tverski, and others who were inspired by them, constructed rigorous experiments to test this and other related hypotheses. The results of these tests generally are referred to as “prospect theory.” (Kahneman says that he and Tverski chose this name not because it had anything to do with the subject, but because they thought it was catchy and people would remember it.)

They would not have had to test me for very long to come to the conclusion that fear is the central driver of every trading decision I enter into, and though I cannot offer empirical evidence to support the following thesis, my guess is that most traders feel the same way. I’d also suggest that the degree to which fear overwhelms rational thinking dictates the level of success a trader will achieve. In other words, because of the fear of trading losses, probability doesn’t matter much. Once there is a possibility of getting stopped out, you may find it difficult to think of anything else.

Prospect Theory 101

If you experienced a financial windfall of, say, a million dollars, and a casino offered you the opportunity to keep the money or flip a coin on a double-or-nothing bet, what would you do? There is extensive empirical evidence that says you would decline the bet and not lose a moment’s sleep over it. In “proving” that most people would be unwilling to gamble away a sure thing ca conclusion that sounds right even to those of us who have never had the chance to carry out our own research in behavioral finance – two well-known economic principles are revealed: status quo

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bias and risk aversion. In other words, most people assume that the way things are is better than the way they will be if circumstances change. Furthermore, most people have no interest in playing Russian roulette, even when winning offers a significant benefit. Therefore, it is surprising to find out that when Kahneman and Tverski modified the circumstances of this very question – but not the outcome – the vast majority of respondents reacted much differently than one might expect. In their initial study, they posed two scenarios:

SCENARIO #1

Choose between the following:

1. You have a 100-percent chance of winning \$3,000, or
2. You have an 80-percent chance of winning \$4,000 and a 20-percent chance of winning nothing.

Eighty percent of the respondents chose the certain \$3,000, notwithstanding the fact that they had an excellent chance to win significantly more; this is a textbook case of status quo bias and risk aversion.

Then, however, the subjects were presented with a different scenario:

SCENARIO #2

Choose between the following:

1. You have a 100-percent chance of losing \$3,000, or
2. You have an 80-percent of losing \$4,000 and a 20-percent chance of breaking even.

The results of this test were quite startling. Ninety-two percent of the respondents chose to risk losing \$4,000 and try to break even, even though they had the chance to lock in a significantly lower loss, and it was highly likely that by taking the gamble they would end up losing considerably more. So much for status quo bias and risk aversion. So much for the invisible hand.

What is most surprising about the outcome is that while the verbiage used in Scenario #2 suggests it is a different case than Scenario #1, in fact, it is identical in terms of the risk undertaken. Both cases present a choice of a sure thing to be weighed against a gamble. On the surface, the cases seem dissimilar because one offers the great likelihood of walking away a winner and the other offers, at best, only a small chance of breaking even. Nonetheless, in both cases, the mathematical expectation of assuming the gamble is \$3,200 ($\$4,000 \times 80$ percent). In other words, in the first scenario, where one is likely to be rewarded for taking the gamble, the vast majority was more concerned about averting the 20-percent chance of getting nothing. In the second scenario, however – where one is likely to be punished for gambling – all but eight percent of the respondents chose to put themselves in harm's way, to ignore the status quo and risk an uncertain outcome of dubious potential benefit.

Kahneman and Tverski performed many similar types of experiments and found that subjects repeatedly responded as the initial subjects did, acting in a risk-averse manner when it came to winnings and seeking risk when faced with a potential loss. Given what we think we know about status quo bias and risk aversion, how can we explain these seemingly inconsistent pathologies? The most logical conclusion, contrary to the traditional assumption, is that it is not risk that people abhor, but taking losses.

Consider Tverski's elegant explanation, which ought to resonate especially well with those pessimistic souls whose glass is perpetually half-empty (and you know who you are):

"Probably the most significant and pervasive characteristic of the human pleasure machine is that people are much more sensitive to negative than positive stimuli...Think about how well you feel today, and then try to imagine how much better you could feel...There are a few things that would make you feel better, but the number of things that would make you feel worse is unbounded."

But the research also tells us that an individual's valuation of risk is largely contingent on the reference point from which they consider the risk and has little to do with the actual financial outcome. In other words, it is not how rich you are that drives the decision-making process, but whether the decision you make is likely to render you richer or poorer. Tverski said, "Our preferences... can be manipulated by changes in the reference points."

Prospect Theory: A Trader's Perspective

In the same way that Davey's father felt better about sending his ne'er-do-well son \$500 once he was satisfied that Davey had asked for the money properly, a trader can choose to make bad trading decisions through rationalizations that seem plausible on the surface. But it is not rational at all when a trader defies better judgment simply by changing the context. When you pull a stop order on a losing position just before it is touched because suddenly you are convinced that the 200-day moving average should support the market – notwithstanding the fact that you did not consider the 200-day moving average when you entered into the trade – you have abdicated rational thinking in favor of blind hope. The fear of taking a loss has consumed your ability to think about the entire trade. You can only focus on the likelihood of a negative outcome, and you are willing to do anything to avoid it, even if it means doing something you know to be foolish.

How can such self-destructive behavior be explained? Daniel Kahneman believes that the human mind is comprised of two thinking systems, with very distinct qualities. He refers to System 1 as intuition, which leads us to respond to the world unconsciously. Because the operations of System 1 are "fast, effortless, associative, emotionally charged and governed by habit," they are difficult to modify or control. He refers to System 2 as reason. While it is "deliberate, slower, serial, effortful and deliberately controlled," the great strength of System 2 is that it "can follow rules." System 1 and System 2 fight for primacy whenever a decision needs to be made. Moreover, System 1 tends to take over when risk is involved because, as Kahneman and Tverski discovered in their research, System 1 is difficult to modify and control, particularly when fear is present.

As a trader, I view this as an epic battle between enlightenment and darkness, so much so that when I have to make a difficult decision – should I establish a position, do I take a profit, should I cut my loss – it sometimes feels as if over one shoulder there hovers a serene angel, bathed in ethereal light. He speaks to me softly. He wants to see me make money and urges me to do the right thing. I beg him to tell me what to do, and he smiles but says nothing because we both know that with a moment's introspection the answer will become clear to me. Over the other shoulder is a hideous goblin, dressed in a shiny suit. He is smoking

an awful cigar and smells like he has just bathed in a tub of Jack Daniels. There is lipstick on his collar. He smacks me rudely in my head and commands, "Bet it all, sucker!" It is hard to understand why I would listen to this character, but more often than I like to admit, I turn to him for inspiration.

SIDEBAR

And Now, More on Prospect Theory

Prospect theory is an enormously complex subject that cannot be adequately dealt with in a short article such as this. For anyone who wants to learn more about it and behavioral finance in general, there are a number of good sources with which to begin:

- 1) *The Winners Curse: Paradoxes and Anomalies of Economic Life.* Richard H. Thaler. The Free Press. 1992.
- 2) *Against the Gods: The Remarkable Story of Risk.* Peter L. Bernstein. John Wiley & Sons. 1996.
- 3) *A Mathematician Plays the Stock Market.* John Allen Paulos. Basic Books. 2003.
- 4) *The New Financial Order: Risk in the 21st Century.* Robert J. Schiller. Princeton University Press. 2003.
- 5) *Freakonomics: A Rogue Economist Explores the Hidden Side of Everything.* Steven D. Levitt and Stephen J. Dubner. William Morrow. 2005.

For more ambitious readers, the following sources offer some of Kahneman and Tverski's most important research in their full academic and technical glory:

- 1) *The American Psychologist.* "A Perspective on Judgment and Choice: Mapping Bounded Rationality." Daniel Kahneman. Vol. 58, No. 9. 697-720. 2003.
- 2) *Econometrica.* "Prospect Theory: An Analysis of Decisions Under Risk." Daniel Kahneman and Amos Tverski. Vol. 47. 263-291. 1979.

Finally, there is a 2003 interview with Daniel Kahneman in *strategy+business*, a quarterly magazine published by the consulting firm, Booz, Allen, Hamilton. The interview is non-technical and worth reading in conjunction with the sources listed above. It can be found at <http://www.strategy-business.com/press/article/03409?tid=230&pg=all>

Increasing Prospects of Successful Trading

So what can we derive from all of this that can improve our trading and maybe even the quality of our lives? The message of prospect theory is that many human beings choose complacency over proactivity. They relegate their intelligence to a remote corner of the brain and rely on their innate senses and often fallacious assumptions to protect them from danger. They persist in this self-destructive behavior even at the worst possible time, when risk causes anxiety. We can, however, try to put in

place safeguards against succumbing to this fundamental weakness in our character. Successful traders understand that both intuition and reason can be used to create productive trading methodologies. They combine the strengths inherent to each system of thinking and ignore the elements in both systems that might distract them from meeting their goals.

I remember that when I began trading, one of the older pit traders – he was at least 30 – gave me the following answer when completely frustrated with my lack of success. I begged him to tell me the secret to making money. He immediately replied, “You need to see the forest for the trees.” As the years have gone by – I recently commemorated my 24th year as a trader – I have come to realize that my would-be mentor was completely wrong, but not because he used such a hackneyed line to answer my question, although one can only hope that in the world to come there shall be some appropriate form of reckoning for cliché-mongers. He was wrong, because a trader needs to see not only the forest and trees, but the blue jay nesting in a treetop feeding a worm to her baby chick. The details matter, and the broad scope matters.

Prospect theory reminds us that we have the capacity to see and deal with every changing situation, that we can combat fear with knowledge, anxiety with composure, and learn from our mistakes. In fact, even after 24 years of trading and hundreds of thousands of transactions, my goal each day is the same as it was when I began: to learn something from every trade and to avoid repeating the same dumb mistakes. After all, there are so many unexplored, infinitely more disastrous mistakes to be made and so little time.



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