YOUR MONEY and YOUR BRAIN

Humankind evolved to seek rewards and avoid risks, but not to invest wisely. To do that, you’ll have to outwit your impulses—especially the greedy and fearful ones.

by JASON ZWEIG

For most purposes in daily life, your brain is a superbly functioning machine, steering you away from danger while guiding you toward basic rewards like food, shelter and love. But that brilliant machine can lead you astray when it comes to investing. You buy high, only to sell low. You try to time the market. You follow the crowd. You make the same mistakes again. And again.

How come? We’re beginning to get answers. Scientists in the emerging field of “neuroeconomics”—a hybrid of neuroscience, economics and psychology—are making stunning discoveries about how the brain evaluates rewards, sizes up risks and calculates probabilities. With the wonders of imaging technology we can observe the precise neural circuitry that switches on and off in your brain when you invest.

Those pictures make it clear that your investing brain often drives you to do things that make no logical sense—but make perfect emotional sense. Your brain developed to improve our species’ odds of survival. You, like every other human, are wired to crave what looks rewarding and shun what seems risky. To counteract these impulses your brain has only a thin veneer of modern, analytical circuits that are often no match for the power of the ancient parts of your mind.

And when you win, lose or risk money, you stir up some profound emotions including hope, surprise, regret and the two we’ll examine here: greed and fear. Understanding how those feelings—as a matter of biology—affect your decision-making will enable you to see as never before what makes you tick, and how you can improve, as an investor.

Greed: THE THRILL OF THE CHASE

WHY IT IS SO HARD

For most of us to learn that the old saying “money doesn’t buy happiness” is true! After all, we feel as if it should. The answer lies in a cruel irony that has enormous implications for financial behavior. Our brains come equipped with a biological mechanism that is more aroused when we anticipate a profit than when we get one.

I lived through the rush of greed in an experiment run by Brian Knutson, a neuroscientist at Stanford University. Knutson put me into a functional magnetic resonance imaging (fMRI) scanner to trace my brain activity while I played a kind of investing video game that he had designed. By combining an enormous magnet and a radio signal, the fMRI scanner pinpoints momentary changes in the level of oxygen as blood ebbs and flows within the brain, enabling researchers to map the neural regions engaged by a particular task.

In Knutson’s experiment, a display inside the fMRI machine showed me a sequence of shapes that each signaled a different amount of money: zero ($0.00), medium ($1.00), or large ($5.00). I had to decide whether each amount displayed; if it was a square, I could lose the amount shown. After each shape came up, between 2 and 2½ seconds would pass—that’s the anticipation phase, when I was on tenterhooks waiting for my chance to win or lose—and then a white square would appear for a split second. To win or avoid losing the amount I had been shown, I had to click on my finger when the square appeared. At the highest of the three levels of difficulty, I had less than one-fifth of a second to hit the button. After each try the screen showed how much I’d just won or lost and updated my cumulative score.

When a shape signaling a small reward or a loss appeared, I clicked placidly and either won or lost. But if a circle marked with the symbols of a big easy payout came up, I could feel a wave of expectation sweep through me. At that moment, the fMRI scan showed, the neurons in a reflexive, or emotional, part of my brain called the nucleus accumbens fired like wild. When Knutson measured the activity triggered by the scan, he found that the possibility of winning $500 set off twice as strong a signal in my brain as the chance at gaining $1.00 did.

On the other hand, learning the outcome of my actions was no big deal. Whenever I captured the reward, Knutson’s scanner found that the neurons in my nucleus accumbens fired immediately in front of us.

must much less intensely than when they had been waiting to get it. Based on the dozens of people Knutson has studied, it’s highly unlikely that your brain would respond much differently. On the other hand, learning the outcome of my actions was no big deal. Whenever I captured the reward, Knutson’s scanner found that the neurons in my nucleus accumbens fired immediately in front of us.

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BETTER THAN A BEACON

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FEAR

by Hiko Shimizu

３”s not always easy to recognize a stock’s potential reward. But given the potential for riches, the behavior of traders is inevitably important.

Some traders are willing to take a chance on a stock that hasn’t performed well in the past. Others are more cautious, waiting for the stock to perform before they invest. But no matter how you approach the market, it’s important to remember that the potential for reward is always there. So why do some traders choose to invest in a stock that has performed poorly in the past, while others avoid it?

One reason is that traders have different risk tolerance levels. Some are willing to take on more risk in order to potentially earn higher returns, while others prefer to invest in stocks that have a lower risk of losing money. Another reason is that traders have different expectations for the future performance of a stock. Some believe that a stock will perform well in the future, while others think it will perform poorly.

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The worst nuclear accident in history occurred when the reactor at Chernobyl, Ukraine, melted down in 1986. According to early estimates, tens of thousands of people might be killed by radiation poisoning. By 2006, however, fewer than 100 had died. Meanwhile, nearly 8,000 Americans are killed every year by skin cancer, commonly caused by overexposure to the sun. In the typical year, deer are responsible for roughly 130 human fatalities—seven times more than alligators, bears, sharks and snakes combined. Deer, of course, don’t attack. Instead, they step in front of cars, causing deadly collisions. None of this means that nuclear radiation is good for you or that rattlesnakes are harmless. What it does mean is that we are often most afraid of the least likely dangers, and frequently not worried enough about the risks that have the greatest chances of coming home to roost. We’re no different when it comes to money. Every investor’s worst nightmare is a stock market collapse like the crash of 1929. According to a recent survey of 1,000 investors, there’s a 5% chance that “in any given year, the U.S. stock market might drop by one-third.” In fact the odds that U.S. stocks will lose a third of their value in a given year are around 2%. The real risk isn’t that the market will melt down, but that inflation will erode your savings. Yet only 31% of the people surveyed were worried that they might run out of money during their first 10 years of retirement. If we were logical we would judge the odds of a risk by asking how often something bad has actually happened under similar circumstances. Instead, explains psychologist Daniel Kahneman, “we tend to judge the probability of an event by the ease with which we can call it to mind.” The more recently it occurred, or the more vivid our memory of something like it in the past, the more “available” an event will be in our minds—and the more probable its recurrence will seem.

Now let’s look at the answers.

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The result is that a moment of panic can wreak havoc on your investing strategy. Because the amygdala is so attuned to big changes, a sudden drop in the market tends to be more upsetting than a longer, slower decline, even if it’s greater in total. On Oct. 19, 1987, the U.S. stock market plunged 23%—a deeper one-day drop than the crash of 29. Big, sudden and inexplicable, the ’87 crash was exactly the kind of event that sparks the amygdala. The memory was hard to shake. In 1988, U.S. investors sold $15 billion more shares in stock mutual funds than they bought, and their net purchases of stock funds didn’t recover to pre-crash levels until 1991. One bad Monday disrupted the behavior of millions of people for years. There was something more at work here than merely investors’ individual fears. Anyone who has ever been a teenager knows that peer pressure can make you do things as part of a group that you might never do on your own. So do you make a conscious choice to conform, or does the herd exert an automatic, almost magnetic, force? People were recently asked to judge whether three-dimensional objects were the same or different. Some folks were tested made these choices in isolation. Others times they first saw the responses of four “peers” (who were, in fact, colluding with the researcher). While the former’s choice of radiation, they were right 84% of the time. The peer group all made the wrong choice, however, the individuals being tested chose correctly just 59% of the time. Brain scans showed that when the subjects followed the group, activation in parts of their frontal cortex decreased, as if social pressure was somehow overpowering the reflective, or analytical, brain. When people did back the consensus, brain scans found intense firing in the amygdala. Neuroscientist Gregory Berns, who led the study, calls this flare-up a sign of “the emotional load associated with standing up for one’s belief.” Social isolation activates some of the same areas in the brain that are triggered by physical pain. In short, you go along with the herd not because you want to, but because it’s too hard—and you lose your ability to evaluate how likely you are to early estimates, tens of thousands of people might be killed by radiation poisoning. By 2006, however, fewer than 100 had died. Meanwhile, nearly 8,000 Americans are killed every year by skin cancer, commonly caused by overexposure to the sun. In the typical year, deer are responsible for roughly 130 human fatalities—seven times more than alligators, bears, sharks and snakes combined. Deer, of course, don’t attack. Instead, they step in front of cars, causing deadly collisions. None of this means that nuclear radiation is good for you or that rattlesnakes are harmless. What it does mean is that we are often most afraid of the least likely dangers, and frequently not worried enough about the risks that have the greatest chances of coming home to roost. We’re no different when it comes to money. Every investor’s worst nightmare is a stock market collapse like the crash of 1929. According to a recent survey of 1,000 investors, there’s a 5% chance that “in any given year, the U.S. stock market might drop by one-third.” In fact the odds that U.S. stocks will lose a third of their value in a given year are around 2%. The real risk isn’t that the market will melt down, but that inflation will erode your savings. Yet only 31% of the people surveyed were worried that they might run out of money during their first 10 years of retirement. If we were logical we would judge the odds of a risk by asking how often something bad has actually happened under similar circumstances. Instead, explains psychologist Daniel Kahneman, “we tend to judge the probability of an event by the ease with which we can call it to mind.” The more recently it occurred, or the more vivid our memory of something like it in the past, the more “available” an event will be in our minds—and the more probable its recurrence will seem.

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