LAS VEGAS uses flashing lights and ringing bells to create an illusion of reward and to encourage risk taking. Insurance company offices present a more somber mood to remind us of our mortality. Every marketer knows that context and presentation influence our decisions.

For the first time, economists are studying these phenomena scientifically. The economists are using a new technology that allows them to trace the activity of neurons inside the brain and thereby study how emotions influence our choices, including economic choices like gambles and investments.

For instance, when humans are in a "positive arousal state," they think about prospective benefits and enjoy the feeling of risk. All of us are familiar with the giddy excitement that accompanies a triumph. Camelia Kuhnen and Brian Knutson, two researchers at Stanford University, have found that people are more likely to take a foolish risk when their brains show this kind of activation.

But when people think about costs, they use different brain modules and become more anxious. They play it too safe, at least in the laboratory. Furthermore, people are especially afraid of ambiguous risks with unknown odds. This may help explain why so many investors are reluctant to seek out foreign stock markets, even when they could diversify their portfolios at low cost.

If one truth shines through, it is that people are not consistent or fully rational decision makers. Peter L. Bossaerts, an economics professor at the California Institute of Technology, has found that brains assess risk and return separately, rather than making a single calculation of what economists call expected utility.

Researchers can see on the screen how people compartmentalize their choices into different parts of their brains. This may not always sound like economics but neuro-economists start with the insight — borrowed from the economist Friedrich Hayek — that resources are scarce within the brain and must be allocated to competing uses. Whether in economies or brains, well-functioning systems
should not be expected to exhibit centralized command and control.

Neuro-economics is just getting started. The first major empirical paper was published in 2001 by Kevin McCabe, Daniel Houser, Lee Ryan, Vernon Smith and Theodore Trouard, all economics professors. (Professors McCabe, Houser and Smith are colleagues of mine at George Mason University.) A neuro-economics laboratory at Cal Tech, led by Colin F. Camerer, a math prodigy and now an economics professor, has assembled the foremost group of interdisciplinary researchers. Many of the early entrants, who have learned neurology as well as economics, continue to dominate the field.

Investors are becoming interested in the money-making potential of these ideas. Imagine training traders to set their emotions aside or testing their objectivity in advance with brain scans. Futuristic devices might monitor their emotions on the trading floor or in a bargaining session and instruct them how to compensate for possible mistakes.

Are the best traders most adept at reading the minds of others? Or is trading skill correlated with traits like the ability to calculate and ignore the surrounding caldron of human emotions?

More ambitiously, future research may try to determine when a short-term price bubble will collapse. Does the market tide turn when people stop smiling, adjust to their adrenalin levels or make different kinds of eye contact?

Not all of neuro-economics uses brain scans. Andrew W. Lo, a professor at the Sloan School of Management at the Massachusetts Institute of Technology, applied polygraph-like techniques to securities traders to show that anxiety and fear affect market behavior. Measuring eye movements, which is easy and cheap, helps the researcher ascertain what is on a subject's mind. Other researchers have opened up monkey skulls to measure individual neurons; monkey neurons fire in proportion to the amount and probability of rewards. But do most economists care? Are phrases like "nucleus accumbens" — referring to a subcortical nucleus of the brain associated with reward — welcome in a profession caught up in interest rates and money supply? Skeptics question whether neuro-economics explains real-world phenomena.

The neuro-economists admit that their endeavor is in its infancy. It is difficult to identify brain modules and their roles. Even if one part of the brain is active at a particular moment, how is that incorporated into a person's broader method for making decisions?

The number of people scanned in any study is typically small, if only because the hookups cost about $500 an hour and require access to an expensive machine. Furthermore, the setting may matter. Perhaps we cannot equate choices made on the New York Stock Exchange trading floor with choices made under a hospital scanner, where the subject must lie on his back, remain motionless and
endure a loud whirring, all the while calculating a trading strategy.

That said, neuro-economics will make huge strides as technology allows researchers to identify more brain regions and read brains more accurately and at lower cost. It is a growth area in a profession that knows human feelings matter, but does not always know what to do with them.

The next step? Perhaps neuro-economics should turn its attention to political economy. Do people use the same part of their brains to vote as to trade? Is voting governed by fear, disgust or perhaps the desire to gain something new and exciting?

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