

Decision-making Processes in Equity Investing: The Case for **Investment Frameworks**

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Studies have demonstrated that people are irrational in systematic and predictable ways, which can lead to severe errors. It is difficult to avoid or correct such errors due to peculiar aspects of how we naturally reach and evaluate decisions. Specifically, research indicates that we tend to examine evidence in a biased, incomplete fashion; quickly reach a rushed decision before we realize it; and distort our perception of reality in order to support and rationalize that decision, in which we are overconfident. We believe that this model of decision making is especially dangerous in equity investing.

How can we avoid making irrational investment decisions? An awareness of common cognitive biases is likely insufficient. We believe that reliance on an investment framework is potentially a superior solution. A framework is particularly effective in diverting us from biases, because—somewhat ironically—it actually exploits one of our innate decision-making tendencies, turning a potential trap into an aid.

Summary

Studies from the field of judgment and decision making have demonstrated conclusively that people are irrational in systematic and predictable ways. In fact, cognitive biases can compromise our objectivity on virtually any issue while we remain blissfully unaware. Such biases are invisible and unavoidable because much of the mental activity supporting our perceptions, judgments, and decisions occurs outside of our awareness, operating much like an autopilot function. This enhances our mental efficiency but can lead to serious errors, which may be fostered by our innate decision-making tendencies. Specifically, research indicates that we tend to examine evidence in a biased, incomplete fashion, if at all; quickly reach a rushed decision before we even realize it; and then distort our perception of reality in order to support, justify, and rationalize that decision, in which we are overconfident. We believe that this model of decision making is particularly dangerous in equity investing because it is generally possible to rationalize even the poorest of decisions, as the value of a stock is highly sensitive to profit trends in an uncertain future.

How can we avoid making irrational investment decisions? Some investors have suggested that merely being aware of common biases and heuristics will help them to avoid falling into their traps. However, we do not believe such awareness alone is likely to prove particularly effective, as research suggests that the innately biased brain cannot objectively determine whether it is being biased. For an investor who has become familiar with common cognitive biases, it is tempting to run through a checklist of them when making decisions, looking for signs of irrationality at work in hopes of correcting it. Alternatively, an investor who is aware of common biases may look for evidence of irrationality in the market's behavior in order to exploit it. However, such tasks are exceedingly complicated—there are many potential biases; a single decision may be influenced by more than one; and biases often conflict with each other. An investor typically can concoct a “just so” story that seemingly explains how a decision or market reaction has been biased in a certain way, but the plausibility of a post hoc explanation by no means guarantees its accuracy. Leveraging an awareness of common behavioral biases to avoid or exploit irrationality may sound like a straightforward exercise to many investors, but in reality it is nothing of the sort.

We believe that reliance on a framework for making investment decisions is potentially a superior solution. A framework is particularly effective in diverting us from biases, because—somewhat ironically—it actually exploits one of our natural decision-making tendencies, turning a potential trap into an aid. Indeed, researchers have demonstrated that our decisions about an issue are strongly influenced by how we frame that issue. By simplifying but limiting our perspectives, frames shape our judgments and decisions in meaningful ways, even if we generally do not notice. Our tendency to rely on frames may be innate, but fortunately we can change our frames through conscious effort to make them more effective. Ideally, a frame should draw attention to the factors that really matter and obscure factors that our biases are likely to overemphasize. Such a frame offers the dual benefits of both focusing us on the variables that we value while also keeping malicious biases outside of the decision-making process so that they do not infect our judgments.

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If a frame is well designed, pointing us in the right direction and away from decision-making traps, we want it to exert its influence strongly. Thus, we prefer a formalized, structured, numerically based frame, which we refer to as an “investment framework.” In contrast, an abstract mental construct, such as a general “philosophy” of investing, is an inadequate frame because it leaves too much mental “wiggle room” for biases to influence decisions. Because it diverts us from potential biases, emphasizes relevant factors, and makes it more difficult to rationalize poor decisions, a well-designed investment framework can be a much more powerful solution than attempts to accurately identify and correct for biases in investment decisions through unreliable self-monitoring.

The Importance of Decision-making Processes in Investing

What do we believe is the key to outperformance in equity investing? If we assume that all investors are able to make rational investment decisions based on the information at their disposal, then we can infer that superior information is the key driver to outperformance. Certainly, investors operating at a disadvantage in terms of information and expertise will find it difficult to compete. But let's revisit the assumption that investors are able to make rational decisions. Studies from the field of judgment and decision making have demonstrated conclusively that people actually are irrational in systematic and predictable ways. It is not that they lack the desire or intelligence to make good decisions; it is that human nature prevents them from doing so.

Led by the pioneering work of Nobel laureate Daniel Kahneman and the late Amos Tversky, researchers have identified a litany of innate biases that can lead to severe errors and irrational decisions. Many biases arise from our reliance on potentially misleading cognitive heuristics, which are simplifying "rules of thumb" that serve as mental shortcuts. Other sources of irrationality include our preference for consistency, our susceptibility to emotions and wishful thinking, and the influence of framing effects and social factors. An exhaustive catalog of different types of biases is beyond the scope of this paper, but the key point is that they can compromise our objectivity on virtually any issue while we remain blissfully unaware. As observed in the Harvard Business Review, "What makes all these traps so dangerous is their invisibility. Because they are hardwired into our thinking process, we fail to recognize them—even as we fall right into them" (Hammond, et. al. 1998).

For a more tangible sense of how biases can lead to irrationality in our investment decisions, let's consider one type of bias, the "endowment effect," in some detail. The endowment effect is a term for the pattern "that people often demand much more to give up an object than they would be willing to pay to acquire it," which has been demonstrated by numerous studies (Kahneman, et. al. 1991). One experiment, for example, randomly divided subjects into three groups called Buyers, Sellers, and Choosers. The Buyers were asked whether they would be willing to buy a mug at each of a series of prices (ranging from \$0.25 to \$9.25). The Sellers were each given a mug and asked whether they would be willing to sell it at the same set of prices. The Choosers were asked whether, for each of those same prices, they would prefer to receive that amount of money or a mug. In other words, all three groups

were asked to value the same mug, but their perspectives differed in terms of what they were "giving up" (money, the mug, or nothing). Choosers, who were presumably the most indifferent between the mug and the money, had a median reservation price of \$3.12. Buyers, apparently needing a slight discount to make the transaction worthwhile, bid a median of \$2.87 for the mug. Sellers, however, were not nearly on the same page, demanding a median of \$7.12 for their mugs, suggesting that possession of the mug caused them to mentally overvalue it, on average, by more than double. Remember, the Sellers were chosen at random, so it is highly unlikely that the group just happened to have an unusually strong affinity for mugs. Instead, it seems that ownership of the mug hindered their ability to objectively value it. "Our propensity to overvalue what we own is a basic human bias," notes Duke professor Dan Ariely in his book *Predictably Irrational*.

The endowment effect has obvious implications for equity investors, suggesting that it is more difficult to objectively evaluate a stock once we already own it. We believe that this phenomenon helps explain why so many investors consider sell decisions much more difficult than purchases. Indeed, in a study of institutional investors' sell disciplines, researchers noted, "When to sell a stock is said to be one of the great mysteries of investing" (Faugere 2004). The fact that investors commonly feel the need for a separate sell discipline, distinct from the rest of their investment approach, is implicit acknowledgement that owning a stock presents special challenges to making rational decisions about it. Even if they do not know them by name, investors recognize that biases like the endowment effect are at work.

We are quite susceptible to cognitive biases, such as the endowment effect, due to peculiar aspects of how we naturally reach and evaluate decisions. We will explore those peculiarities at length in this report, but the overarching theme is that biases are invisible and unavoidable because much of the mental activity supporting our perceptions, judgments, and decisions occurs outside of our awareness. It resides in what University of Virginia professor Timothy Wilson calls the "adaptive unconscious," which he describes in his book *Strangers to Ourselves* as "a set of pervasive, adaptive, sophisticated mental processes that occur largely out of view." Depicting the same phenomenon, science journalist Shankar Vedantam coined the more provocative term "the hidden brain," which serves as the title of his own book on the topic. (In this paper, we shall use both terms interchangeably.)

Importantly, the adaptive unconscious not only supports lower-level activities such as breathing and sensory processing, it influences higher-level thought processes, including judg-

ments and decisions, as well. It may seem hard to believe, especially for higher-order functions, that so much mental activity takes place subconsciously. Vedantam points out that “it feels as though most of our mental activity lies within the bright circle of conscious thought.” It makes perfect sense that our mental processes seem largely conscious because the conscious portion typically is all that we notice, but we actually are missing much of the picture. As a result, “we know less than we think we do about our own minds, and exert less control over our minds than we think,” explains Wilson. We may not be able to detect or control the activities of our hidden brain, but they are real and influential. As Vedantam notes, “Intersecting lines of scientific research show that even in higher kinds of thinking, hidden forces often sit beside us and subtly pull us in one direction or another.”

In describing the role of these hidden unconscious activities in our thought processes, Wilson likens them to an autopilot function. “The mind operates most efficiently by relegating a good deal of high-level, sophisticated thinking to the unconscious, just as a modern jumbo jetliner is able to fly on automatic pilot with little or no input from the human, ‘conscious’ pilot. The adaptive unconscious does an excellent job of sizing up the world, warning people of danger, setting goals, and initiating action in a sophisticated and efficient manner. It is a necessary and extensive part of a highly efficient mind,” he writes. The adaptive unconscious handles much of the on-the-fly heavy lifting, which would overwhelm our slow, deliberate conscious thinking. In other words, “a lot of the interesting stuff about the human mind—judgments, feelings, motives—occur outside of awareness for reasons of efficiency,” observes Wilson.

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By facilitating mental efficiency, the hidden brain is generally quite helpful. “Without these nonconscious processes, we would have a very difficult time navigating through the world,” Wilson suggests. However, “This is not to say that nonconscious thinking always leads to accurate judgments,” he cautions. The adaptive unconscious does have its limitations. It is, according to Wilson, automatic, fast, uncontrollable, rigid, and concerned with the here-and-now rather than the long

view. While these properties tend to promote efficiency, they can also foster biases and lead to poor decisions. “Since your hidden brain values speed over accuracy,” Vedantam notes, it is prone to mistakes. As a result, he continues, research has shown “that many errors, mishaps, and tragedies were caused by unconscious forces that acted upon people without their awareness or consent.” Because the activities of the hidden brain are invisible to us, we cannot tell when they are pushing us in the wrong direction.

The human mind undeniably possesses some amazing capabilities, but invariably making rational decisions, free of unconscious cognitive biases, is not one of them. This suggests that, if it is possible to mitigate pernicious biases, better decision making could be an important source of investing outperformance. In fact, we believe that superior decision making, because it is potentially more consistently and broadly applicable, may be a much more powerful asset than superior information in equity investing, particularly in this age of virtually instantaneous electronic dissemination of information and regulations specifically intended to disallow differential access to information. So, how can we improve our investment decision making to transform it into a competitive advantage?

Innate Decision-making Tendencies Can Be Problematic

Before we consider potential solutions, let’s examine the problems with the way we typically make decisions that can lead to irrational mistakes. The first flaw is that we reach our decisions too quickly, often before we even realize it. The sad truth is that we generally make decisions after giving the evidence insufficient consideration, if any. Right now, you are probably saying to yourself something like, “That doesn’t apply to me. I always give careful consideration to all of the available evidence before making any important decision.” Doubtlessly, you fully believe that, but do not be so sure. Remember, your hidden brain is busy exerting its influence, below the level of awareness.

Research has shown that the human mind is incredibly adept at distorting our perceptions and memories to better suit our purposes than reality. Indeed, our minds are apt to play tricks on us, explains neurologist Robert Burton in his book *On Being Certain*, when it comes to the timing of our “feeling of knowing.” He observes that the “apparent cause-and-effect temporal sequence—first the thought, then the assessment of the thought, and then the feeling of correctness—is what gives the feeling of knowing its authority. Any other sequence would not make sense and would strip the feeling of knowing of any practical value. But experience tells us that the feeling

of knowing has a variable temporal relationship to conscious ‘reasoning.’” In other words, the apparent effect may actually occur, in reality, before or during the apparent cause.

Burton demonstrates that the brain uses temporal reordering, an illusory rearranging of a sequence of events, so that the feeling of knowing will “feel as though it followed consideration of the idea” when it in fact occurred earlier in the decision process. He notes that “the brain is capable of smoothing out internal-external time discrepancies to suit its own purposes,” in this case allowing us to believe that our feeling of knowing actually has a rational basis. Burton concludes, “For those thoughts that activate prior thoughts and memories, we cannot know what portion of thought is presently being formed, what is being remembered, or when the feeling of knowing occurred. What might seem like cause-and-effect—A before B, and causing C—cannot always be trusted to be the correct sequence of events. Brain time has its own agenda.”

Apparently, rationality is not always at the top of that agenda.

Our tendency to reach the feeling of knowing before, not after, fully considering the evidence may explain why we tend to place more weight on the earliest data points than on those we encounter later. If your mind is already made up, even if you are not yet aware of it, further data points are unlikely to hold much sway. This overweighting of early versus late evidence, known as the “primacy effect,” was made clear in a set of experiments in which subjects were asked for their impressions of a fictitious person. As Wesleyan professor Scott Plous describes in his book *The Psychology of Judgment and Decision Making*, “Half of the subjects were asked about someone who was envious, stubborn, critical, impulsive, industrious, and intelligent. The other half were asked about someone with the very same characteristics, except that the characteristics were presented in the opposite order: intelligent, industrious, impulsive, critical, stubborn, and envious.” The studies found “that the characteristics appearing early in each series influenced impressions more strongly than the characteristics appearing later,” demonstrating that, even if the data points are exactly the same, changing the order in which we present them can lead to significantly different perceptions. In the world of equities, an investor is likely to find both bullish and bearish evidence about a company, so there is a risk that the ultimate investment decision is determined not by the relative merits of those conflicting data points, but by the order in which they were encountered.

You can already see that our basis for decision making is on shaky ground, but it gets even worse. Not only do we tend to reach our decision, our feeling of knowing, too quickly, but any consideration and reasoning that did go into it was

likely flawed anyway. That is because our perception and interpretation of evidence can be significantly prejudiced by our pre-existing expectations and desires. In his book *Don’t Believe Everything You Think*, Professor Thomas Kida explains, “Research has found that two factors significantly influence how we perceive the world—we see what we expect to see and what we want to see. That is, we often see things because our prior experiences have led us to expect them, or our desires have led us to want to see them.” Again, you may be thinking, “That doesn’t apply to me.” Surely you strive to be fair and objective, see things as they are, and be honest with yourself. But your hidden brain, outside of your control, operates quite differently.

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Numerous studies have demonstrated the biasing influence of expectations on our perceptions, and Dan Ariely has conducted several. For example, in an experiment at MIT’s Sloan School of Management, he and his collaborators opened an “impromptu coffee shop” that “offered students a free cup of coffee if they would answer a few questions” about it. They made available the usual additives, such as milk and sugar, as well as “some unusual condiments—cloves, nutmeg, orange peel, anise, sweet paprika, and cardamom” for customers to use at their discretion. Ariely continues, “After adding what they wanted (and none of our odd condiments were ever used) and tasting the coffee, the participants filled out a survey form. They indicated how much they liked the coffee, whether they would like it served in the cafeteria in the future, and the maximum price they would be willing to pay for this particular brew.” They operated the coffee shop for several days and periodically “changed the containers in which the odd condiments were displayed.” The condiment displays ranged from “beautiful glass-and-metal containers, set on a brushed metal tray with small silver spoons and nicely printed labels” down to short Styrofoam cups with “jagged, hand-cut edges” and labels that were “handwritten in red felt-tip pen.” Interestingly, they discovered that, although none of the students even used the unusual condiments, the type of containers that they were in significantly influenced perceptions of the coffee. Ariely and his colleagues found that “when the odd condiments were offered in fancy containers, the coffee drinkers were much more likely” to indicate that they enjoyed the coffee, that they

would pay a higher price for it, and that they would like the cafeteria to start serving it. In other words, when the participants were primed to expect the coffee to taste better, it tasted better. Likewise, an investor who expects to like a stock probably will.

Research has shown that our perceptions are biased by our desires as well. Scott Plous describes a study conducted after a particularly rough football game, filled with penalties and injuries, between Dartmouth and Princeton in 1951. The researchers asked a “group of students at each school to watch a film of the game and to record any infractions they noticed.” Any sports fans wondering why referees always seem to be biased against their teams should take note of the results. As Plous summarizes, “Dartmouth students observed nearly the same number of infractions on both sides (4.3 for their side and 4.4 for Princeton), whereas Princeton students saw the Dartmouth team commit more than twice as many infractions as the Princeton team (9.8 compared with 4.2 for themselves). In fact, there was such a discrepancy in perceptions that when Princeton sent a copy of the film to several Dartmouth alumni for a group showing, one Dartmouth alumnus who previewed the film could not see any of the Dartmouth infractions and, in confusion, sent Princeton a telegram asking for the rest of the film!” More recently, researchers carefully replicated that study in 1981, “and they came to much the same conclusion.” That is, the perceptions of football fans are distorted to resemble what they desire to see. So are the perceptions of equity investors, and everyone else.

The types of experiments described above have shown conclusively that our perceptions, which shape our decisions, are frequently biased by our expectations and desires, as well as by numerous other factors. To be fair, that is often beneficial. Remember, by contributing to our mental efficiency, the hidden brain is generally helpful, and it has good reason to take creative license with our perception of reality. As Cornell professor Thomas Gilovich explains in his book *How We Know What Isn't So*, “The question of how even-handed we should be in evaluating evidence is rather complex. Not all bias is a bad thing; indeed, a certain amount is absolutely essential. The power and flexibility with which we reason depends upon our ability to use context, generic knowledge, and pre-existing information to disambiguate and extract meaning from new information—and, to some degree, to bias our interpretation of evidence.” In other words, unconscious cognitive bias does have its role. However, in a complex dynamic activity such as equity investing, our biases are frequently misdirected, producing flawed perceptions that lead to costly mistakes.

We Have Trouble Recognizing Our Own Bad Decisions

Our incomplete and biased consideration of evidence is especially troublesome because the hidden brain makes it difficult for us to catch our mistakes until it is too late. Once we have recognized the feeling of knowing and accepted a decision, we become overly certain it is correct and highly unlikely to change it, even in the face of disconfirming evidence, particularly if we have committed to it in some way. In reality, the old adage “seeing is believing” is often less accurate than the trio of “believing is believing,” “committing is believing,” and “believing is seeing.”

Studies have consistently demonstrated that people are overconfident in their own judgments. In his book *Thinking and Deciding*, University of Pennsylvania professor Jonathan Baron describes a study in which “subjects were asked to spell a word and then to indicate their confidence that they were correct as a probability figure (using percents). When subjects said that they were ‘100% certain’ that they were correct, they were actually correct about 80% of the time. When their confidence was 80%, they were correct about 55% of the time. In general, subjects were overconfident. Although their mean confidence was 72%, their mean accuracy was 57% on the words used.” Given how confident we are in our own judgments and decisions, it is amazing how frequently they turn out to be wrong. Often, believing is believing.

You may fairly point out that those subjects who were overconfident in their ability to spell words were not professional spellers. They did not have any special expertise in spelling, and they did not rely on spelling to make their living. Perhaps experts, with their specialized knowledge and experience, would be less susceptible to overconfidence in their professional judgments? Studies of professionals including doctors, lawyers, and engineers, suggest otherwise. Thomas Kida notes, for instance, that researchers have “found no relation between confidence and accuracy when clinicians diagnose brain damage, or when physicians diagnose cancer or pneumonia. In effect, physicians are as confident on the cases they misdiagnose as they are on the cases they diagnose correctly.” At the risk of being overconfident ourselves, we can be reasonably sure that the professional judgments of equity investors are subject to the same bias.

Not only are we overconfident in our judgments, when we act on them our confidence increases even more. Scott Plous describes one study of horse bettors at a racetrack in Canada. Researchers asked “72 people who had just finished placing

a \$2.00 bet within the past thirty seconds, and 69 people who were about to place a \$2.00 bet in the next thirty seconds” to rate their horse’s chances of winning on a 7-point scale. “What they found was that people who were about to place a bet rated the chance that their horse would win at an average of 3.48 (which corresponded to a ‘fair chance of winning’), whereas people who had just finished betting gave an average rating of 4.81 (which corresponded to a ‘good chance of winning’).” Here, committing is believing. The act of betting obviously did not increase their probability of winning, but it did increase their confidence that they would win. From there, it is not much of a stretch to infer that the act of buying a stock would make an equity investor even more overconfident that it will perform well.

That being said, we believe that there is a potentially important flaw in that analogy. The bettors at the racetrack were wagering on the outcome of a one-time event. Equity investors, on the other hand, own a stock on an ongoing basis and are continually exposed to new data points. Wouldn’t their overconfidence be eroded gradually over time by the emergence of conflicting evidence? Actually, not necessarily—the hidden brain is hard at work making sure that does not happen. We are much more comfortable with cognitive consonance, when beliefs and evidence are in agreement, than with the dissonance experienced when they clash, so it biases us in the preferred direction. It has been well documented that, as Jonathan Baron observes, “People tend not to look for evidence against what they favor,” which obviously helps them maintain consonance. Perhaps even more interesting is how we react when, despite that bias, we do encounter disconfirming evidence.

“As a result of these biases, incorrect beliefs are slow to change, and they can even become stronger when they ought to become weaker.”

As psychologists Carol Tavis and Elliot Aronson describe in their book *Mistakes Were Made (But Not By Me)*, “So powerful is the need for consonance that when people are forced to look at disconfirming evidence, they will find a way to criticize, distort, or dismiss it so that they can maintain or even strengthen their existing belief. This mental contortion is called the ‘confirmation bias.’” We readily accept confirming evidence as obviously true and compelling, but we tend to convince ourselves that disconfirming evidence is in some way

flawed so that we can minimize its meaning, all without recognizing the inherent bias. The extent to which confirmation bias can compromise our objectivity makes it perhaps the most dangerous form of irrationality in investment decision making. Because it allows us to cling to incorrect judgments in the face of evidence that we are wrong, by the time we are forced to admit our mistake, our investment performance likely has suffered already. As Baron summarizes, “As a result of these biases, incorrect beliefs are slow to change, and they can even become stronger when they ought to become weaker.”

Please, read the end of the previous sentence again. Disconfirming evidence not only fails to temper our false beliefs, but can further strengthen them? The answer is yes, which demonstrates just how powerful confirmation bias can be. Tavis and Aronson write: “In one experiment, researchers selected people who either favored or opposed capital punishment and asked them to read two scholarly, well-documented articles on the emotionally charged issue of whether the death penalty deters violent crimes. One article concluded that it did; the other that it did not. If the readers were processing information rationally, they would at least realize that the issue is more complex than they had previously believed and would therefore move a bit closer to each other in their beliefs about capital punishment as a deterrence.” As you might guess, that is not what happened. Instead, after both groups read the exact same articles, they actually moved in opposite directions, with the favoring group becoming more in favor and the opposing group becoming more opposed. Tavis and Aronson conclude, “Not only did each side discredit the other’s arguments; each side became even more committed to its own.” In this case, believing is seeing.

Interestingly, scientists have gained insights into the brain mechanisms that may underlie our confirmation bias. Tavis and Aronson describe one study in which the subjects “were monitored by magnetic resonance imaging (MRI) while they were trying to process dissonant or consonant information about George Bush or John Kerry.” The researchers, they continue, “found that the reasoning areas of the brain virtually shut down when participants were confronted with dissonant information, and the emotion circuits of the brain lit up happily when consonance was restored.” Once we have reached a decision, our reasoning goes on strike in the face of disconfirming evidence, and emotions step in to overemphasize confirming data points. Tavis and Aronson conclude, “These mechanisms provide a neurological basis for the observation that once our minds are made up, it is hard to challenge them.” Indeed, it is far too hard, assuming our goal is to make rational investment decisions.

At this point, we can paint a rough picture of human decision making: we examine the evidence in a biased, incomplete fashion, if at all; quickly reach a rushed decision before we even realize it; and then distort our perception of reality in order to support, justify, and rationalize that decision, in which we are overconfident.

This type of decision making is particularly risky in equity investing because it is possible to rationalize virtually any decision. The value of a stock is highly sensitive to profit trends in an uncertain future. In fact, it is often noted that, because small changes in assumptions can produce large changes in present values, discounted cash flow analyses can be used to justify a very wide range of prices. As a result, there is potential for very significant mistakes in equity investing because no matter how poor your decision is, you will almost surely be able to find a way to justify it. Your hidden brain wants to reinforce your decisions, and equity analysis is an exercise that is usually quite accommodating. According to Thomas Gilovich, “Our desire to believe comforting things about ourselves and about the world does not mean that we believe willy-nilly what we want to believe; such flights of fancy are reined in by the existence of a real world and the need to perceive it accurately.” In equity investing, however, those reins are often quite loose.

Awareness of Potential Biases Is Not Enough

If it is so easy to become locked into irrational investment decisions, then how can we avoid making them in the first place? Some investors have suggested that merely being aware of common biases and heuristics will help them avoid falling into their traps. However, we do not believe such awareness alone is likely to prove particularly effective. As Vedantam notes, “No matter how much you learn about the hidden brain, you will never feel it manipulating you.” We are dealing with flaws in decision making that occur subconsciously and can involve self-deception, so we are not well positioned to prevent, identify, or correct them ourselves. Robert Burton raises “the crucial question of how we determine whether our thoughts are free of perceptual illusions and unsuspected biases.” In other words, how can the innately biased brain objectively determine whether it is being biased?

Research suggests that it cannot. “Knowing that one may be subject to bias is one thing; being able to correct it is another. Studies show that deliberate attempts to debias one’s judgment are of little value,” observes Columbia professor Jon Elster in his book *Explaining Social Behavior*. For example,

one study of confirmation bias, notes Thomas Kida, “found that even when people were told to disconfirm, they still sought confirming evidence about 70 percent of the time.” It appears that self-monitoring our decision making can help, but not much. Burton adds, “Yes, we should engage in ruthless self-reflection and harsh scrutiny, but we should simultaneously acknowledge that such introspection will, at best, only result in a partial view of our minds at work. Complete objectivity is not an option.”

If we are unable to reliably debias our judgments in a laboratory setting even after being told which specific bias to avoid, then prospects must be dim for the much thornier task of self-monitoring decisions in the real world of equity investing. For an investor who has become familiar with common cognitive biases, it is tempting to run through a checklist of them when making decisions, looking for signs of irrationality at work in hopes of correcting it. Alternatively, an investor who is aware of common biases may look for evidence of irrationality in the market’s behavior in order to exploit it. However, such tasks are exceedingly complicated—there are many potential biases; a single decision may be influenced by more than one; and biases often conflict with each other. For instance, behavioral biases can cause either underreaction or overreaction to news, just as they can result in either selling a stock too soon or holding it for too long. As business and economics journalist Justin Fox observes in his book *The Myth of the Rational Market*, “One could come up with a plausible-sounding behavioral explanation for just about every market phenomenon.” An investor typically can concoct a “just so” story that seemingly explains how a decision or market reaction has been biased in a certain way, but the plausibility of a post hoc explanation by no means guarantees its accuracy. By misdiagnosing the underlying biases, “one easily falls into the traps of insufficient correction, unnecessary correction, or overcorrection,” notes Jon Elster.

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This challenge was neatly illustrated in an experiment conducted by Carnegie Mellon researchers. It was similar in design to the study of the endowment effect on mug prices described earlier in this paper, but it included an important

twist. This more recent study determined the reservation prices of Sellers and Choosers for sets of highlighters, but this was done after the subjects had watched and written about one of three movie clips. The clips had been chosen for their ability to induce a sad (*The Champ*), disgusted (*Trainspotting*), or neutral (National Geographic special) emotional state. There was of course no rational connection between the movie-induced emotions and the value of the highlighters, and in fact the subjects had been led to believe that they were parts of two separate unrelated studies. Nonetheless, the scientists observed that, even though “they arise from a prior, irrelevant situation,” the emotional “effects are sufficiently strong that in one case (disgust) they eliminate the endowment effect, and in the other case (sadness) they actually reverse it” (Lerner, et. al. 2004). How can an investor possibly hope to untangle such complications to appropriately correct for biases like the endowment effect? Leveraging an awareness of common behavioral biases to avoid or exploit irrationality may sound like a straightforward exercise to many investors, but in reality it is nothing of the sort.

The brain is not up to the task of policing itself, so we need to look elsewhere for a solution to our irrationality.

If it is so difficult for us to debias our decisions, even when we are aware of the potential pitfalls, then what is our alternative? “There is no isolated circuitry within the brain that can engage itself in thought free from involuntary and undetectable influences,” observes Robert Burton. If we want “to stand back and recognize when we are off base or out to lunch,” he continues, then “we need a fresh point of view, not another voice from the same tainted circuitry.”

The brain is not up to the task of policing itself, so we need to look elsewhere for a solution to our irrationality. Professors Reid Hastie of University of Chicago and Robyn Dawes of Carnegie Mellon provide more specific guidance, suggesting in their book *Rational Choice in an Uncertain World* that “what is needed is some kind of alternative way of making these judgments, a method that ‘affirmatively’ diverts us from relying on intuitions and associations and heuristics.” The prescription they describe is exactly what a well-designed “investment framework” can be for investors.

The Potential Benefits of Investment Frameworks

A framework is particularly effective in diverting us from biases, because—somewhat ironically—it actually exploits one of our natural decision-making tendencies, turning a potential trap into an aid. Indeed, researchers have demonstrated that our decisions about an issue are strongly influenced by how we “frame” that issue. As Professors Edward Russo of Cornell and Paul Schoemaker of The Wharton School explain in their book *Winning Decisions*, frames “are mental structures that simplify and guide our understanding of a complex reality,” but “force us to view the world from a particular, and limited, perspective.” As a result, they continue, “when it comes to making decisions, the way people frame a problem—i.e., the particular perspective they (often unconsciously) adopt—exerts enormous power over the options they will recognize and the solutions they will favor.” Like our expectations and desires, frames act to shape our perceptions and judgments, even if we do not realize it.

Like other forms of mental distortion, frames may be helpful or harmful. As Russo and Schoemaker observe, “Frames draw our attention to certain aspects of a problem while leaving others in the shadows, hidden from our view.” Whether a particular frame adds or detracts value depends on exactly which aspects are highlighted and which are obscured. Fortunately, if your frame is a poor one, you are not sentenced to permanently subpar decision making. Our tendency to rely on frames may be subconsciously innate, but we can change our frames through conscious effort to make them more effective. You may “take strategic control of your frames,” Russo and Schoemaker encourage, “to create the kind of broad, novel, winning perspectives that can form a sturdy foundation for successful decision-making.” If your frame is not working, build a new one that will.

What kind of frame do we want to create for equity investing? If we are to harness the power of framing in our favor, it should draw attention to the factors that really matter and obscure those that our biases are likely to overemphasize. As an oversimplified example, for evaluating a stock’s attractiveness, we might adopt a frame that emphasizes its estimated intrinsic value. Directing our attention to that key variable simultaneously hides from view superfluous factors that are not relevant to the stock’s attractiveness, such as whether we already own it. Such a frame offers the dual benefits of both focusing us on the factors that we value while also keeping malicious biases outside of the decision-making process so that they do not

infect our judgments. In other words, it allows us to exploit our innate mental reliance on frames to help keep us out of trouble.

If the frame is well designed, pointing us in the right direction and away from decision-making traps, we want it to exert its influence strongly. Reality, as Thomas Gilovich observed, reins in our “flights of fancy” that can produce “willy-nilly” beliefs, and we want our frame to tighten those reins even further. Thus, we prefer a formalized, structured, numerically based frame—an “investment framework.” By contrast, an abstract mental construct, such as a general “philosophy” of investing, is an inadequate frame because it leaves too much mental “wiggle room” for biases to influence decisions. A more structured framework, with tighter reins, is better at helping us avoid decision-making traps. Remember, our hidden brain is often looking for ways to justify irrational decisions, and a well-designed formal framework can make such justifications much more difficult.

Our depiction of investment frameworks has remained somewhat vague thus far, but this paper, which has already covered extensive ground, was primarily intended to introduce the need for frameworks. In future research, we hope to explore in greater detail how we can design and implement effective frameworks for equity investing, with a focus on crucial features that may mitigate pernicious biases.

A framework is particularly effective in diverting us from biases, because—somewhat ironically—it actually exploits one of our natural decision-making tendencies, turning a potential trap into an aid.

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