I have organized the remainder of the book around specific applications. I devote part II to applications that feature predictions about the overall market, stock returns, and earnings. Most of these applications concern different forms of heuristic-driven bias and the effect of these errors on market efficiency.

Part III presents applications that involve individual investors, such as selling at a loss, portfolio selection, and retirement saving. These applications deal mostly with frame dependence and heuristic-driven bias.

The applications discussed in the remainder of the book involve all three themes. In part IV I focus on the relationship among the money management industry and the investors they serve. This part deals with institutional investors: open-ended mutual funds, closed-end mutual funds, the management of fixed income securities, and the tax-exempt money management industry.

In part V I look at corporate executives and their relationships with analysts and investors. I discuss these relationships in several contexts: corporate takeovers, initial public offerings, seasoned equity offerings, and analysts' earnings forecasts and stock recommendations. Part VI is devoted to special topics in investment: options, futures, and foreign exchange.

Parts II through VI follow a particular format. Each chapter begins with a short case that illustrates the main message of that chapter. Then, in the remainder of the chapter, I present the general findings from the behavioral finance literature, as typified by the case. The upside of this technique is that it makes the application of behavioral concepts to finance very easy to see. The downside of the technique is *hindsight bias*, a behavioral error. Someone susceptible to hindsight bias views events, after the fact, as being almost inevitable. In presenting these cases, by no means do I wish to suggest that they needed to turn out the way they did. Rather, they happened to do so.

What's Next?

I have arranged the topics in a particular order. Readers will thus find some advantage in reading the chapters consecutively; however, this should not deter those who want to follow a different order. I say this with one caveat. Since the next three chapters focus on main themes of behavioral finance—heuristic-driven bias, frame dependence, and inefficient markets—which constitute the core concepts in the book, I strongly suggest that readers complete these chapters before

Chapter **2**

Heuristic-Driven Bias: The First Theme

This chapter discusses the following:

- availability bias
- representativeness, grade point average, winners, and losers
- regression to the mean and stock market prediction
- gambler's fallacy and stock market prediction
- overconfidence and expert judgment
- anchoring-and-adjustment and earnings forecasts
- aversion to ambiguity

The dictionary definition for the word *heuristic* refers to the process by which people find things out for themselves, usually by trial and error. Trial and error often leads people to develop rules of thumb, but this process often leads to other errors. One of the great advances of behavioral psychology is the identification of the principles underlying these rules of thumb and the systematic errors associated with them. In turn, these rules of thumb have themselves come to be called *heuristics*.

An Illustrative Example

Consider this question: Which is the more frequent cause of death in the United States, homicide or stroke? How do most people go about answering this question? The majority rely on recall, that is, by seeing how many events of each type come readily to mind. If people more readily recall instances of homicide than of stroke, they will

answer "homicide." This simple rule conforms to the principle known as *availability*—the degree to which information is readily available. A rule based on this principle is called an *availability heuristic*.

Heuristics are like back-of-the-envelope calculations that sometimes come close to providing the right answer. But heuristics may involve *bias*, meaning they may tend to be off target in a particular direction, and this can apply to an availability heuristic also. Most people rely on the media for their information about homicides and strokes. Suppose that the media tends to report one cause of death more than the other, because one is newsworthy and the other is not. Then people who rely on an availability heuristic may recall instances related to one type of death more readily than the other. Therefore, media coverage biases a rule based on recall.

What about error? Which is the more frequent cause of death, homicide or stroke? The answer is stroke. In fact, strokes occur *eleven* times as often as homicides (Slovic, Fischoff, and Lichtenstein 1979). People who rely on an availability heuristic tend to be amazed by this fact.

Let's look at these steps from a broader perspective:

- People develop general principles as they find things out for themselves;
- They rely on heuristics, rules of thumb, to draw inferences from the information at their disposal;
- People are susceptible to particular errors because the heuristics they use are imperfect; and
- People actually commit errors in particular situations.

Taken together, these four statements define *heuristic-driven bias*.[1]

Representativeness

One of the most important principles affecting financial decisions is known as *representativeness*. Representativeness refers to judgments based on stereotypes. The principle of representativeness was proposed by psychologists Daniel Kahneman and Amos Tversky (1972), and analyzed in a series of papers reproduced in the collection edited by Kahneman, Slovic, and Tversky (1982).

Consider an example involving admissions officers in universities. One measure of successful admission decisions is that students who

are admitted perform well scholastically. Therefore, imagine a situation where an admissions officer is attempting to predict the grade point average (GPA) of some prospective students based upon their high school GPA levels.

Here are some actual data for undergraduates at Santa Clara University, based on students who entered the university in the years 1990, 1991, and 1992.[2] During this period, the mean high school GPA of students who entered as freshmen and graduated was 3.44 (standard deviation was 0.36). The mean college GPA of those same students was 3.08 (standard deviation 0.40). Suppose you are given the task of predicting the graduating GPA for three undergraduate students, based solely on their high school GPA scores. The three high school GPA scores are 2.20, 3.00, and 3.80. What are your predictions for the college GPAs of these students upon graduation?

In administering this question to large groups, I have obtained very consistent mean responses. Table 2-1 contains the mean predictions along with the actual results. The average predictions for the question are 2.03, 2.77, and 3.46, whereas the actual results are 2.70, 2.93, and 3.30, respectively. Notice that at both the low end and the high end, the predictions are too far from the mean of 3.08. That is, both the low (2.20) and high (3.80) high school GPAs result in college GPAs that are much closer to the mean than the predictions. These responses illustrate that people do not appreciate the extent to which there is *regression to the mean*.

Representativeness is about reliance on stereotypes. The simplest example based on this principle is to predict that college GPA will be the same as high school GPA. Now most people do not use as simple a rule as this one. But they do base their predictions on how *representative* a student appears to be. Thus a student with a high GPA in high school

Table 2-1
Actual GPAs are closer to the mean than predicted GPAs.

High School GPA	Predicted College GPA	Actual College GPA
2.20	2.03	2.70
3.00	2.77	2.93
3.80	3.46	3.30

is seen as representative of a good student. Notice that they are especially hard on students with low high school GPAs. What most people fail to appreciate is that students with the lowest high school GPAs may have experienced bad luck, and consequently will, on average, do better in college.[3] So, the heuristic involves bias; representativeness can be misleading. Again, people fail to recognize regression to the mean. Therefore, they are predisposed to making errors when they predict the future GPA of particular individuals.

A financial example illustrating representativeness is the winner-loser effect documented by Werner De Bondt and Richard Thaler (1985, 1987). De Bondt and Thaler find that stocks that have been extreme past losers in the preceding three years do much better than extreme past winners over the subsequent three years. De Bondt (1992) shows that the long-term earnings forecasts made by security analysts tend to be biased in the direction of recent success. Specifically, analysts overreact in that they are much more optimistic about recent winners than they are about recent losers.

Do you recognize any similarities with the GPA question above? De Bondt and Thaler base their argument on the misapplication of representativeness. In effect, I suggest that investors treat past losers like high school students with low GPAs, and past winners as high school students with high GPAs. Notice that the predictions are particularly pessimistic when it comes to the low GPA students. People tend to predict that a student with a low high school GPA will end up with an even lower college GPA, indicative of a "kick 'em when they're down" perspective.[4] As we shall see in chapter 4, the same phenomenon also appears to be at work when it comes to stocks. The returns to past losers are exceptionally high, suggesting that investors become unduly pessimistic about the prospects of these stocks.

Before leaving representativeness, let us consider one more example showing that although financial professionals may recognize regression to the mean, they may not apply it properly. Below is an excerpt from an interview that appeared in the August 18, 1997 issue of *Fortune* magazine, with global strategist Barton Biggs of Morgan Stanley and senior investment adviser Robert Farrell of Merrill Lynch (Armour, 1997). This interview occurred after two-and-one-half years of spectacular stock market returns. I have divided the excerpt into two parts. The first part sets the stage for a discussion about regression to the mean, and also for an issue that comes up in chapter 5 (on skewed confidence intervals). Here is the first part of the excerpt:

> ***Biggs:*** My view is that we're at the very tag end of a super bull market. That means the prudent person who's thinking ahead toward retirement should assume that over the next five to ten years the total return from his equity portfolio is going to be in the 5%- to 6%-a-year range.
>
> ***Fortune:*** NOT THE 15% TO 20% WE'VE COME TO LOVE AND EXPECT?
>
> ***Biggs:*** Right. It's very late in the game.
>
> ***Farrell:*** Trouble is, it's looked that way for a long time.
>
> ***Biggs:*** Yes, but it's never looked as much that way as it does right now.

We will come back to the "late-in-the-game issue" a little later. For now, consider regression to the mean.

> ***Farrell:*** It's been better to have been a novice than a professional the past few years, because people with the most experience have been the most cautious. But markets do regress back to the mean (return to their long-term average performance), and I agree we are late in the ball game. This is the longest period we've ever had with such high returns from equities, and I can't believe it's a new era that will just keep going forever. I don't know if returns going forward will be 7% or 8%, but I'm pretty sure they will be below average.

This interview raises a number of very important issues. Look first at the last three sentences in Robert Farrell's remarks, where he predicts below-average returns. What's his rationale? Well, he says markets "regress back to the mean" and points out that this "is the longest period we've ever had with such high returns."

Is a prediction of below-average returns appropriate? Take another look at table 2-1, the GPA example. Would we predict that the student with the 3.80 high school GPA would end up with a college GPA *below* the mean of 3.08? I don't think so. Regression to the mean suggests that future returns will be closer to their historical average. But it doesn't say they will be *below* their historical average.[5]

Farrell's error, too low a prediction, stems from *gambler's fallacy*. If five tosses of a fair coin all turn out to be heads, what is the probability that the sixth toss will be tails? If the coin is fair, the correct answer is one-half. Yet many people have a mental picture that when a fair coin is tossed a few times in a row, the resulting pattern will feature about the same number of heads as tails. In other words, the representative

pattern features about the same number of heads and tails. So, after a run of five heads, people tend to predict tails on the sixth toss, because of the representativeness heuristic. From their perspective, "a tail is due." But this reasoning is wrong, just as below-average returns are no more likely after "the longest period we've ever had with such high returns."

Gambler's fallacy arises because people misinterpret the law of averages, technically known as the "law of large numbers." They think the law of large numbers applies to small samples as well as to large samples. This led Tversky and Kahneman (1971) to facetiously describe gambler's fallacy as the "law of small numbers."

Let's go back to Farrell's remarks about future returns. Notice that he tells us he is "pretty sure they will be below average." Time will tell if he ultimately is right. I say ultimately because in the twenty-one months that followed the *Fortune* magazine interview, the S&P 500 returned more than 41 percent. But his statement that he is "pretty sure" leads us to the next issue—*overconfidence.*

Overconfidence

Here is a question for you.

> The Dow Jones Industrial Average closed 1998 at 9181. As a price index, the Dow does not include reinvested dividends. If the Dow were redefined to reflect the reinvestment of all dividends since May 1896, when it commenced at a value of 40, what would its value have been at the end of 1998? In addition to writing down your best guess, also write down a low guess and a high guess, so that you feel 90 percent confident that the true answer will lie between your low guess and your high guess.

Ready? The answer to the preceding question is found in the title of a paper by Roger Clarke and Meir Statman (1999): "The DJIA Crossed 652,230 (in 1998)." If people were well calibrated, then 90 out of every 100 would find that the correct answer lay between their low and high guesses. But when I ask this question as part of a survey, virtually nobody finds that the true answer lies between his or her low and high guesses. For most, their high guesses are much too low. So most people are not well calibrated. Instead, they are overconfident.

When people are overconfident, they set overly narrow confidence bands. They set their high guess too low (and their low guess too high).

Hence, they get surprised more frequently than they anticipated. Later in this volume we will come across Wall Street strategists who, in the course of reviewing their predictions in the light of actual events, speak about being "humbled." In other words, they were overconfident in their predictions.

Anchoring-and-Adjustment, Conservatism

Next is a textbook problem in probability, designed by psychologist Ward Edwards (1964) that provides some insight into analysts' earnings revisions.

> Imagine 100 book bags, each of which contains 1,000 poker chips. Forty-five bags contain 700 black chips and 300 red chips. The other 55 bags contain 300 black chips and 700 red chips. You cannot see inside any of the bags. One of the bags is selected at random by means of a coin toss. Consider the following two questions about the selected book bag.
>
> 1. What probability would you assign to the event that the selected bag contains predominantly black chips?
> 2. Now imagine that 12 chips are drawn, with replacement, from the selected bag. These twelve draws produce 8 blacks and 4 reds. Would you use the new information about the drawing of chips to revise your probability that the selected bag contains predominantly black chips? If so, what new probability would you assign?

This problem is analogous to the tasks faced by financial analysts. The bag is like a company that in the future may operate in the black or in the red. So in accordance with generally accepted accounting colors, black chips stand for good future earnings, red for poor future earnings. Analysts start out with information that leads them to form their initial beliefs. In this case, beliefs concern the probability that the bag contains predominantly black chips. The most frequent answer given to the first of the two preceding questions is 45 percent. So, the bag of chips is like a company that appears more likely to generate poor future earnings than good future earnings.

The second question is a lot more difficult than the first. The drawing of 8 black chips and 4 red chips is akin to a positive earnings announcement. So now the question is how to react to a positive earnings announcement made by a company that has not been performing all that well.

When I administer these questions, I find that the two most frequent responses to the second question are 45 percent and 67 percent—the two most *salient* numbers in the problem—with 45 percent being the number of bags containing predominantly black chips, and 67 percent the fraction of black chips drawn with replacement.

Those who respond with 45 percent essentially do not know how to incorporate the new information. So, they stick with their initial beliefs. Since the "earnings announcement " is favorable, they *underreact*.

People who answer 67 percent (or thereabouts) focus on the fact that two thirds of the chips drawn with replacement are black. They ignore their prior information, in accordance with the representativeness heuristic. Do they overreact, underreact, or get it just right?

The correct answer to the second question is 96.04 percent. About 55 percent of those responding choose either 45 percent or 67 percent; The remaining responses are scattered. But most are well below 96 percent. In fact, most are below 75 percent. In other words, most people respond too *conservatively* to the new information in this problem. Perhaps they get anchored on to 45 percent and do not adjust sufficiently to the new information.

This is how security analysts react to earnings announcements: They do not revise their earnings estimates enough to reflect the new information. Consequently, positive earnings surprises tend to be followed by more positive earnings surprises, and negative surprises by more negative surprises. Of course, the unexpected surprises in store for analysts are also a manifestation of overconfidence because overly narrow confidence bands mean people get surprised more frequently than they anticipate.

Aversion to Ambiguity

Imagine that I offered you the choice between accepting a sure $1,000 or an even gamble in which you either win $0 or $2000. When I pose this question in MBA classes, about 40 percent of the students say they would take the gamble.

I describe this choice to students by telling them that there is a bag containing 100 poker chips, 50 black chips and 50 red chips; they can choose a sure $1,000, or a lottery ticket that pays $2,000 if a black chip is drawn at random from the bag but $0 if a red chip is drawn.

Now consider this variation. Imagine the bag contains 100 colored chips that are either red or black, but the proportions are unknown. Many people who are willing to gamble when the odds are even prefer

to play it safe and take the sure $1,000 when the odds are unknown. This phenomenon is known as the *aversion to ambiguity*. People prefer the familiar to the unfamiliar.

Remember the Wall Street proverb about greed and fear? I note that the emotional aspect of aversion to ambiguity is fear of the unknown. The case of Long-Term Capital Management, discussed in chapter 1, provides an apt example of this phenomenon. Recall that on September 23, 1998, a $3.6 billion private rescue of LTCM was arranged. The Federal Reserve Bank of New York orchestrated this plan because of a concern that the failure of LTCM might cause a collapse in the global financial system. The November 16, 1998, issue of the *Wall Street Journal* describes the scene as the participants departed the meeting at which the deal was struck. The article attributes an interesting remark to Herbert Allison, then president of Merrill Lynch, a remark that typifies aversion to ambiguity as fear of the unknown. "As they filed out, they were left to ponder whether all this was necessary, and whether a collapse would really have jolted the global financial system. 'It was a very large unknown,' Merrill's Mr. Allison says. 'It wasn't worth a jump into the abyss to find out how deep it was.'"[6]

Emotion and Cognition

The issues discussed in this chapter involve cognitive errors, that is, errors that stem from the way that people think. But in describing ambiguity to aversion in terms of fear of the unknown, I suggest that some phenomena involve a combination of cognition and emotion. Of course, both involve mental processes, and may be physiologically linked, as opposed to being separate from each other. Scholars have produced ample evidence that emotion plays an important role in the way people remember events. So, phenomena involving the availability heuristic may reflect both cognitive and emotional elements. Here is an example.

In 1972, the Dow closed at 1020. In 1982 it closed at 1047, just 27 points higher than the value achieved a decade earlier. In between, it gyrated wildly, recording four years of negative growth. During this period, inflation reduced the purchasing power of a dollar by over 66 percent. A 1995 article in the *Wall Street Journal* quotes Russell Fuller, president of RJF Asset Management (now Fuller & Thaler Asset Management) in San Mateo, California, as follows: "'People like myself, who have been in the business since before the 1973–74 crash, we

were terrified by that crash,' says Mr. Fuller, the money manager. 'That's a very low probability event. But many of the people in this business have spent the last 20 years worrying about that happening again.'"[7]

Summary

This chapter described the first theme of behavioral finance, heuristic-driven bias, and introduced some of the main heuristics upon which financial practitioners rely. Throughout the book, readers will encounter many instances of representativeness, anchoring-and-adjustment, overconfidence, availability bias, and aversion to ambiguity. These heuristics surface in many different contexts, such as analysts' earnings forecasts, investors' evaluation of mutual fund performance, corporate takeover decisions, and the types of portfolios selected by both individual and institutional investors. Because of their reliance on heuristics, practitioners hold biased beliefs that render them vulnerable to committing errors. In addition to the heuristics described in this chapter, readers will come across a host of others, such as excessive optimism, the illusion of validity, hindsight bias, the illusion of control, and self-attribution error. There are many examples of such errors in this book.

Chapter 3

Frame Dependence: The Second Theme

This chapter discusses the following:

- loss aversion, loss realization, and losing projects
- mental accounting, frame dependence, and facing risk
- hedonic editing and tolerance for risk
- self-control and dividends
- regret and pension fund allocation
- money illusion and inflation

Frame *independence* lies at the heart of the Modigliani-Miller approach to corporate finance. Merton Miller has a succinct description of frame independence. When asked to explain, in twenty-five words or less, the essence of his contributions with Franco Modigliani, he said: "If you transfer a dollar from your right pocket to your left pocket, you are no wealthier. Franco and I proved that rigorously."[1]

It is a matter of form whether a person keeps a dollar of wealth in the right pocket or in the left pocket. The form used to describe a decision problem is called its *frame*. When I speak of frame independence, I mean that form is irrelevant to behavior. Proponents of traditional finance assume that framing is *transparent*. This means that practitioners can see through all the different ways cash flows might be described. Yet many frames are not transparent but rather are *opaque*. When a person has difficulty seeing through an opaque frame, his decisions typically depend on the particular frame he uses. Consequently, a difference in form is also a difference in substance. Behavior reflects frame dependence.

Loss Aversion

In their landmark work on *prospect theory*, a descriptive framework for the way people make choices in the face of risk and uncertainty, Daniel Kahneman and Amos Tversky (1979) provide evidence of frame dependence. The starting point in their work is the role of "loss," an issue explored by Harry Markowitz (1952b). Kahneman and Tversky studied how people respond to the prospect of a loss. Here is one of their examples. Suppose you face a choice between (1) accepting a sure loss of $7,500, or (2) taking a chance where there is a 75 percent chance you will lose $10,000 and a 25 percent chance you will lose nothing. The expected loss in both choices is $7,500. Would you choose to take the guaranteed loss or take a chance? Most people opt for the latter. Why? Because they hate to lose! And the uncertain choice holds out the hope they won't have to lose. Kahneman and Tversky call this phenomenon *loss aversion*. They find that a loss has about *two and a half times* the impact of a gain of the same magnitude.[2]

It is not difficult to find real-world illustrations of loss aversion. In a manual for stockbrokers, Leroy Gross (1982) describes the difficulties investors face in coming to terms with losses.

> Many clients, however, will not sell anything at a loss. They don't want to give up the hope of making money on a particular investment, or perhaps they want to get even before they get out. The "get-evenitis" disease has probably wrought more destruction on investment portfolios than anything else. . . .
>
> Investors who accept losses can no longer prattle to their loved ones, "Honey, it's only a paper loss. Just wait. It will come back." (p. 150)

Some people learn about "get-evenitis" the hard way. Take the case of Nicholas Leeson. In 1995, Leeson became famous for having caused the collapse of his employer, 232-year-old Barings PLC. How? He lost over $1.4 billion through trading. In 1992, Leeson began to engage in rogue trading in order to hide errors made by his subordinates. Eventually, he incurred losses of his own, and "get-evenitis" set in. He asserts that he "gambled on the stock market to reverse his mistakes and save the bank."[3]

"Get-evenitis" also afflicts corporate executives' ability to terminate losing projects. For example, 3Com's popular Palm Computing products, the handheld organizers that access data with a stylus, had a

CEO John Sculley was thoroughly committed to the Newton, and made it the center of his personal vision for the computer industry. He coined the term "personal digital assistant" to describe the concept and argued that it would be a pivotal step in the convergence of three industries: computing, communications, and entertainment.[5]

Development of the Newton began in 1987, and the product was launched in 1993. But at $1000, it was much too expensive for the mass market. Moreover, because of initial failures in its handwriting recognition capability, cartoonist Gary Trudeau lampooned the Newton in his comic strip *Doonesbury*. Given the size and demographics of Gary Trudeau's readership, think about the impact the availability heuristic had on Newton's potential market.

By January 1994, it was apparent that sales were disappointing and the Newton was a losing project. But Apple did not terminate it. The company was committed to personal digital assistants. A year later, in January 1995, Apple had added enhanced features, and the year after that it came out with a backlit screen, but to no avail. In March 1997 Apple spun the Newton off into its own division, but this did little good, and six months later Apple folded the division back into its own organization. Through all this, the Newton remained a loser.

CEOs may come and go, but losing projects stay on. John Sculley "went"; he was replaced by Gil Amelio, who also came and went. In a dramatic comeback, Steve Jobs, Apple's cofounder and first CEO, replaced Amelio. Years before, Sculley had ousted Jobs. In January 1998, about ten years after its inception, CEO Jobs announced his decision to terminate the Newton project.

Concurrent Decisions

Here is another Kahneman-Tversky decision problem:

> Imagine that you face the following pair of *concurrent* decisions. First examine both sets of choices, then indicate the option you prefer for each.
>
> *First decision:* Choose
>
> *A.* a sure gain of $2,400, or
>
> *B.* a 25 percent chance to gain $10,000 and a 75 percent chance to gain nothing.
>
> *Second decision:* Choose
>
> *C.* a sure loss of $7,500, or
>
> *D.* a 75 percent chance to lose $10,000 and a 25 percent chance to lose

The way that people respond to this problem tells us a lot about their approach to making decisions. Consider your own responses. Choosing *A* in the first decision would be the risk-averse choice. Most people find a sure $2,400 difficult to pass up. Although $10,000 is a lot more than $2,400, the odds of collecting it are only one in four. Hence, the expected value of *B* is $2,500, considerably less than $10,000. In fact, $2,500 is just a tad more than the guaranteed $2,400 offered in *A*.

Did you recognize the second decision? We encountered it before, in the previous section. Did you respond the same way as before? In my own experience, about 90 percent choose *D* in the second decision problem. They want the chance to get even.

The two decision problems together constitute a concurrent "package." But most people do not to see the package. They separate the choices into *mental accounts*. And that brings us to frame dependence.

Suppose you face a choice. You can take a 75 percent chance you will lose $7,600 and a 25 percent chance you will win $2,400. Or you can take that same chance and accept an additional $100. Which choice would you make? A no-brainer, right? It should be: This decision frame is transparent.

But sometimes the frame is opaque. Consider the decision problem at the beginning of this section. When I administer this problem to my MBA students, about half choose *A* & *D: A* in the first decision problem and *D* in the second. People who choose *A* & *D* end up facing a 25 percent chance of winning $2,400 and a 75 percent chance of losing $7,600. However, they could do better: They could choose the *B* & *C* combination, which would offer them a 25 percent chance of winning $2,500 and a 75 percent chance of losing $7,500. But most people don't see through the opaque frame. Therefore, they act as if they don't value $100. The opaque frame makes for a "brainer" instead of a no-brainer.

Hedonic Editing

In his stockbroker manual, Gross (1982) implicitly raises the issue of frame dependence within the context of realizing a loss. His essential point is that investors prefer some frames to others, a principle known as *hedonic editing*. Consider Gross's advice to stockbrokers:

> When you suggest that the client close at a loss a transaction that you originally recommended and invest the proceeds in another position

> act of faith can more easily be effected if you make use of some transitional words that I call "magic selling words."
>
> The words that I consider to have magical power in the sense that they make for a more easy acceptance of the loss are these: "Transfer your assets." (p. 150)

Why are "transfer your assets" magic selling words? Because they induce the client to use a frame in which he or she reallocates assets from one mental account to another, rather than closing a mental account at a loss.

Thaler and Eric Johnson (1991) propose a theory of hedonic editing for mental accounts. As part of a study, they administered a series of choice problems to subjects. You will find two of these problems below. Read the first problem, record your answer, and then move on to the next problem.

1. Imagine that you face the following choice. You can accept a guaranteed $1,500 or play a stylized lottery. The outcome of the stylized lottery is determined by the toss of a fair coin. If heads comes up, you win $1,950. If tails comes up, you win $1,050. Would you choose to participate in the lottery? Yes or no? Yes means you take your chances with the coin toss. No means you accept the guaranteed $1,500.[6]
2. Imagine that you face the following choice. You can accept a guaranteed loss of $750 or play a stylized lottery. The outcome of the stylized lottery is determined by the toss of a fair coin. If heads comes up, you lose $525. If tails comes up, you lose $975. Would you accept the guaranteed loss? Yes or no? Yes means you accept a $750 loss. No means you take your chance with the coin toss.

Let's consider how people usually respond to these questions. In the first choice problem, the majority prefer to take the guaranteed $1,500 over the gamble where they might get less. This could be viewed as a typical risk-averse response, because the average payoff to the lottery ticket is $1,500, the same amount involved in the riskless option. However in the second choice problem, many people choose the lottery over the guaranteed loss. This is decidedly a risk-seeking response, in that the expected payoff to the coin toss is a $750 loss, the same amount involved in the riskless option.

There is a lesson here: People are not uniform in their tolerance for risk. It depends on the situation. Some appear to tolerate risk more

It is common for financial planners and investment advisers to administer risk tolerance quizzes in order to determine a degree of risk that is suitable for their clients. However behavioral finance stresses that tolerance for risk is not uni-dimensional. Rather it depends on several factors, one being recent experience facing risk. Here are two more examples developed by Thaler and Johnson that bring out the complexity of these issues.

3. Imagine that you have just won $1,500 in one stylized lottery, and have the opportunity to participate in a second stylized lottery. The outcome of the second lottery is determined by the toss of a fair coin. If heads comes up, you win $450 in the second lottery. If tails comes up, you lose $450. Would you choose to participate in the second lottery after having won the first? Yes or no?
4. Imagine that you have just lost $750 in one stylized lottery, but have the opportunity to participate in a second stylized lottery. The outcome of the second lottery is determined by the toss of a fair coin. If heads comes up, you win $225 in the second lottery. If tails comes up, you lose $225. Would you choose to participate in the second lottery after having lost in the first? Yes or no?

Now that you have recorded your yes or no answers, compare your response to choice 3 with your response to choice 1. From a dollar perspective, choices 1 and 3 are equivalent. In the framework of traditional finance, people should respond the same to both. Yet in practice, many "switch" their choices. When replicating the Thaler-Johnson study I have found that about 25 percent of the respondents are more willing to take the gamble in choice problem 3 than they are in the dollar-equivalent choice problem 1. Why?

Thaler and Johnson suggest that the answer involves hedonic editing, the way people organize their mental accounts. In choice problem 3, if people lose $450 they combine it with the $1,500 gain and experience the net position of $1,050—exactly the situation they are presented with in choice problem 1. But if they win, they do not net their two gains; instead, they savor them separately. According to Thaler and Johnson, the added attraction of experiencing gains separately inclines people to be more willing to gamble.

Thaler and Johnson found that in choice problem 2, over 75 percent chose to gamble rather than accept a sure $750 loss.[7] However, although example 4 is dollar-equivalent to choice problem 2, almost 50 percent switch their choice from taking a gamble in example 2 to

explanation based on the way people experience losses. They note that people seem incapable of netting out moderately sized losses of similar magnitudes. So, a loss of $225 coming on top of a prior loss of $750 is especially painful. The added pain leads people to shy away from taking the gamble as framed in choice problem 4, relative to the frame in choice problem 2.

Cognitive and Emotional Aspects

People who exhibit frame dependence do so for both cognitive and emotional reasons. The cognitive aspects concern the way people organize their information, while the emotional aspects deal with the way people *feel* as they register the information.

The distinction between cognitive and emotional aspects is important. For example, the main cognitive issue in choice problem 3 is whether people ignore having just won $1,500 when deciding whether or not to take an even chance on winning or losing $450. Some do ignore the $1,500, whereas others see themselves as being $1,500 ahead. The cognitive and emotional aspects operate together, in that those who ignore the $1,500 *feel* a $450 loss as just that, a $450 loss. But those who begin by seeing themselves as $1,500 ahead instead experience a $450 loss as a smaller gain of $1,050. This difference affects behavior: Because of loss aversion, people who ignore having just won $1,500 are much less prone to accepting the gamble than those who see themselves as $1,500 ahead. Thaler and Johnson call this a "house money" effect.[8]

The term *frame dependence* means that the way people behave depends on the way that their decision problems are framed. Hedonic editing means they prefer some frames to others. That is the main insight to be gleaned from studying how people chose in the four preceding choices. In a financial context, hedonic editing offers some insight into investors' preference for cash dividends. When stock prices go up, dividends can be savored separately from capital gains. When stock prices go down, dividends serve as a "silver lining" to buffer a capital loss. Remember Merton Miller's succinct description of frame independence? Some investors prefer to keep dividends in their right pocket.

The following excerpt, taken from a *Forbes* magazine interview with closed-end fund manager Martin Zweig, describes how he came to realize the importance of dividends. It began with the fact that his fund was trading at a deep discount relative to net asset value (NAV), the value the shares would trade for if the fund were open-ended in-

> Then in 1986 we did a closed-end fund. . . . I always worried about discounts on closed-end funds. . . . The first nine months out of the gate, we were at a 17 percent discount. I was mortified. I sat down and did a lot of thinking. Bond funds at the time were selling at about parity. Stock funds were all at discounts. It didn't make sense, because stocks do better than bonds in the long run. And I realized bond funds pay interest. People like the certainty of an income stream. So I said, "Well, we're going to pay the dividend, whether we earn it or not." And we went to this 10 percent dividend policy. . . . The discount narrowed immediately. (Brimelow, 1998)

Self-Control

Self-control means controlling emotions. Some investors value dividends for self-control reasons as well as for reasons that stem from hedonic editing.

Martin Zweig talks about paying a dividend whether earned or not because people "like the certainty of an income stream." What does a reliable dividend have to do with self-control? Meir Statman and I (Shefrin and Statman 1984) argue that the answer involves the "don't dip into capital" heuristic. Older investors, especially retirees who finance their living expenditures from their portfolios, worry about spending their wealth too quickly, thereby outliving their assets. They fear a loss of self-control, where the urge for immediate gratification leads them to go on a spending binge. Therefore, they put rules into place to guard against the temptation to overspend.

"Don't dip into capital" is akin to "don't kill the goose that lays the golden eggs." But if you don't dip into capital, how do you finance consumer expenditures—Social Security and pension checks alone? Not necessarily—this is where dividends come in. Dividends are labeled as income, not capital. And investors tend to frame dividends as income, not capital. Again, this is frame dependence. Investors feel quite comfortable choosing a portfolio of stocks that feature high dividend payouts and spending those dividends.

Regret

Imagine someone who makes a decision that turned out badly and engages in self-recrimination for not having done the right thing. *Regret* is the emotion experienced for not having made the right decision. Regret is more than the pain of loss. It is the pain associated with feel-

For example, imagine someone who has a regular route to work. One day, for the sake of variety, she decides to try a different route. That particular day she winds up in an accident. Now, even if the odds of an accident were no different on the two routes, how will that person feel? Will she chastise herself, thinking "If only I had done what I always do and taken my regular route!" If so, she is experiencing the frustration of regret.

Regret can affect the decisions people make. Someone who feels regret intensely, does not have a strong preference for variety, and thinks ahead, may follow the same route to work every day, in order to minimize possible future regret.

Here is a financial example. Consider the choice of equity-fixed income allocation in a defined contribution retirement plan. In the January 1998 issue of *Money* magazine, Harry Markowitz explains what motivated his personal choice about allocation. As the Nobel laureate recognized for having developed modern portfolio theory, was he seeking the optimum trade-off of risk and return? Not exactly. He said, "My intention was to minimize my future regret. So I split my contributions fifty-fifty between bonds and equities" (Zweig 1998, 118). In other words, had Harry Markowitz selected a 100 percent equity allocation, and had stocks subsequently done terribly, it would have been to easy, in hindsight, to imagine having selected a more conservative posture—and this would give rise to considerable self-recrimination, meaning regret.

Regret minimization also leads some investors to use dividends, instead of selling stock, to finance consumer expenditures. Those who sell stock to finance a purchase, only to find that shortly thereafter the stock price soars, are liable to feel considerable regret. That is often at the heart of expressions such as "this is my half-million-dollar car."

Money Illusion

Frame dependence also impacts the way that people deal with inflation, both cognitively and emotionally. This is the issue of *money illusion*. Let us examine the following questions from a study by Eldan Shafir, Peter Diamond, and Amos Tversky (1997).

> Consider two individuals, Ann and Barbara, who graduated from the same college a year apart. Upon graduation, both took similar jobs with publishing firms. Ann started with a yearly salary of $30,000. During her first year on the job, there was no inflation, and in her sec-

started with a yearly salary of $30,000. During her first year on the job, there was 4 percent inflation, and in her second year, Barbara received a 5 percent ($1500) raise in salary.

a. As they entered their second year on the job, who was doing better in economic terms, Ann or Barbara?

b. As they entered their second year on the job, who do you think was happier, Ann or Barbara?

c. As they entered their second year on the job, each received a job offer from another firm. Who do you think was more likely to leave her present position for another job, Ann or Barbara?

Most people indicate that Ann is better off, Barbara is happier, and Ann is more likely to look for another job. Now this is somewhat perplexing. If Ann is better off, why is she less happy and more likely to look for another position? Shafir, Diamond, and Tversky suggest that although people can figure out how to adjust for inflation, it is not a natural way for them to think. The natural way is to think in terms of nominal values. Therefore people's emotional reaction is driven by the nominal values, and those appear more favorable for Barbara than they do for Ann.

Summary

This chapter presents the second theme of behavioral finance, frame dependence, which deals with the distinction between form and substance. Framing is about form. In short, frame dependence holds that differences in form may also be substantive. It reflects a mix of cognitive and emotional elements. The cognitive issues pertain to the way that information is mentally organized, especially the coding of outcomes into gains and losses. There are several emotional issues, the most fundamental of which is that people tend to feel losses much more acutely than they feel gains of comparable magnitude. This phenomenon has come to be known as loss aversion. Therefore, people prefer frames that obscure losses, if possible—and engage in hedonic editing. People tend to experience losses even more acutely when they feel responsible for the decision that led to the loss; this sense of responsibility leads to regret. Regret is an emotion. People who have difficulty controlling their emotions are said to lack self-control. Some people use framing effects constructively to help themselves deal with self-control difficulties.

Chapter **4**

Inefficient Markets: The Third Theme

This chapter discusses the following:

- representativeness, and the market's treatment of past winners and losers
- anchoring-and-adjustment, and the market's reaction to earnings announcements
- loss aversion, and the risk premium on stocks
- sentiment, and market volatility
- overconfidence, and the attempt to exploit mispricing

Cause and Effect

One of the most fiercely debated questions in finance is whether the market is efficient or inefficient. Remember the hedge fund Long-Term Capital Management (LTCM)? How did it advertise itself to investors? LTCM members promoted their firm as an exploiter of pricing anomalies in global markets. In this regard, consider the following heated exchange between Myron Scholes, LTCM partner and Nobel laureate, and Andrew Chow, vice president in charge of derivatives for potential investor Conseco Capital. Chow is quoted as saying to Scholes, "I don't think there are that many pure anomalies that can occur"; to which Scholes responded: "As long as there continue to be people like you, we'll make money."[1]

That last remark might not be the best way to win friends and influence people. But Scholes is correct about cause and effect—investors' errors are the cause of mispricing. Is the market efficient?