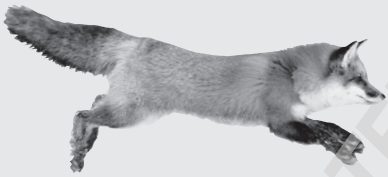

CHAPTER 1

FOXES VS. HEDGEHOGS

Tiger Woods is a fox. So are Billy Beane and Steven Cohen. Warren Buffett is mostly a fox, but he has a bit of hedgehog in him.

The investment strategists behind the hedge fund Long-Term Capital Management were full-blooded hedgehogs.

Woods is the best golfer of his generation, and many argue he could end his career as the best golfer ever. Beane is the general manager of the Oakland A's Major League Baseball team. Cohen runs the hedge fund firm SAC Capital Advisors. Buffett is considered one of the most successful investors ever and runs Berkshire Hathaway Inc. (which, among other interests, holds GEICO, the insurance company with the little green gecko).

Long-Term Capital Management was a hedge fund that initially earned investment returns that made others envious but ended in a spectacular, headline-grabbing failure that many speculate could have led to a global financial meltdown were it not for the intervention of federal regulators.

Investors could do very well by emulating the foxlike tendencies of Tiger Woods, Billy Beane, Steven Cohen, and Warren Buffett. Investors are very well advised not to emulate Long-Term Capital Management and other hedgehogs. Investors should strive to be foxes, not hedgehogs. But it is not the specific actions or accomplishments of the foxes named here that should be emulated. Instead, how they think and strategize are the keys to their long-term success. These traits can be learned by others and applied to improve investment returns.

THE EVOLUTION OF TIGER

Tiger Woods entered the world of professional golf at the top. After winning the amateur title twice, he turned professional and immediately won the first major tournament he entered, the Masters. He not only won the Masters, Woods dominated the tournament and finished 12 strokes ahead of his nearest competitor.

Not long after that victory, however, Woods worked with an instructor to change his swing. That project was productive. In the next seven years, Woods won seven more majors and a host of other tournaments. He often was ranked the top golfer in the world.

At the top of the golf world and seemingly at the top of his game, Woods sought another instructor and again set about changing his swing. As instructor Hank Haney explained to the *Wall Street Journal* ("Struggles at the Top" by John Paul Newport, June 17, 2006), nothing was wrong with Woods's game. But other golfers were responding to his dominance by improving their own games and spending more time in the gym. Woods was among the first professional golfers to make fitness and athleticism important elements of his training program. He could see that other golfers were following this practice and becoming more competitive.

Woods believed that to keep improving and to stay on top, changes had to be made. Woods also was looking forward to the day when he was older and his body not as resilient. The new swing was designed to be more consistent and more powerful, but also to put less strain on the body.

The transition period was a difficult one for Woods. His game slipped, and he did not win any tournaments in 2004. But in 2005 he had perhaps his best year to date, winning six events including two major tournaments. Once again he was the top-ranked golfer in the world, and the successes continued through 2006.

MONEYBALL PARTS I AND II

Billy Beane gained fame by turning the Oakland A's into a playoff-bound team with a salary budget a fraction of those of perennial powerhouses such as the New York Yankees. Beane, the hero of *Moneyball: The Art of Winning an Unfair Game* by Michael Lewis (New York: W. W. Norton, 2003), located unheralded but quality players by throwing out traditional scouting reports and instead analyzing statistics. A key insight of Beane and his staff was to look beyond traditional statistics such as batting average, home runs, and hits. Instead, they decided that the key statistics were on-base percentage for hitters and the strikeout rate for pitchers. The result was that he found players who performed well in the Major Leagues without having to bid for them against other teams.

Things did not go smoothly for Beane after the publication of *Moneyball.* Other teams began to copy his methods and focus on his key statistics when selecting players. They bid up the prices for players Beane found appealing. Also, the bargain players Beane found in the past became free agents and either signed with or were traded to teams that would pay them more. Compounding these difficulties is that some of the players Beane signed earlier did not reach potential. The A's failed to make the playoffs in 2004 and 2005.

Yet, in 2006, the A's came back to make the playoffs and win their division title before finally losing in the league championship series.

As other teams caught on to his methods, Beane had to change. One move was to analyze the statistics and conclude that a portion of the problem in 2005 was bad luck, not a lack of skilled players. A major reorganization was not required. Two years earlier Beane already had altered his strategy by drafting high school and junior college pitchers. Previously, he drafted primarily four-year college players who had pitched many innings against quality teams. With many other teams now fishing in his pond, Beane moved to another

spot. Also, since everyone else was focusing on the on-base percentage of batters, Beane focused on those with the most walks. As for pitchers, since other teams bid up the salaries for pitchers with high strikeout rates, Beane instead sought infielders with good defensive skills to back up the pitchers he could afford.

Beane kept his basic approach of seeking players that were better than the marketplace recognized, and therefore could be had for relatively low salaries. But he changed his way of finding and evaluating value, because other teams were bidding up salaries of players with the qualities he initially sought.

THE UNKNOWN BILLIONAIRE

Steven Cohen quietly became a billionaire by managing a hedge fund that achieved spectacular returns. From 1992 through 2005, he generated for his investors an average annual return of 43.5 percent, after subtracting his 3 percent annual management fee and 50 percent share of profits.

Cohen earned his high returns by quickly trading in and out of stocks. He often had no knowledge of what a company did or what its financial fundamentals were. Instead, he followed the trading patterns of stocks. He bought and sold based on what was called "tape watching" in the days when stock prices were reported on paper ticker tapes. Investment positions were held for short periods of time (a few weeks on average), and the number of trades was high.

After the bull market ended in 2000, the markets began to change. After 2002, Cohen decided the changes were long term and his strategy needed to adapt. According to a profile published in the *Wall Street Journal* ("The Hedge-Fund King Is Getting Nervous" by Susan Pulliam, September 16, 2006), Cohen altered his strategy to focus more on fundamentals and to hold stocks longer, from 6 to

12 months. He also told investors to expect lower returns in future years because there would be fewer opportunities in the markets. Cohen concluded that the days of making high returns were over as were the days of profiting from quick trading.

THE FLEXIBLE ORACLE

Warren Buffett was schooled by the legendary Benjamin Graham in the strict value style of investing. Graham's method, explained in detail in *Security Analysis* (New York: McGraw-Hill, 1951) with coauthor David L. Dodd and *The Intelligent Investor* (New York: HarperCollins, 1973, 2003) involves determining the percentage of a firm's value its stock is selling for. Graham preferred using a company's book value and purchasing only stocks that sold for two-thirds or less of the company's book value. Buffett began investing this way and earned strong returns for his investors.

In the late 1960s, Buffett decided that he did not understand the stock market at the time and closed his investment partnership. He returned funds to his investors and began managing a major holding of his portfolio, Berkshire Hathaway. Most of his management involved investing the firm's cash.

Over time, Buffett refined and changed his investment strategy. With guidance from his partner, Charlie Munger, Buffett looked for companies with strong franchises that were selling at reasonable prices. A franchise is a barrier to entry or unique product or service that is difficult for competitors to overcome or imitate. Buffett had another period of spectacular returns by purchasing franchise companies such as local newspapers, Coca-Cola, American Express, and GEICO. Most of the stocks were purchased after bad news caused a price decline. But Buffett has said that the stocks were not purchased solely because they were cheap. The growth potential of their

franchises was an essential characteristic a company had to have before it would be purchased.

Buffett again changed his investment approach as the great bull market of the 1990s pushed stock valuations out of his comfort range. This time, Buffett began purchasing entire companies and had them operate as wholly owned subsidiaries of Berkshire Hathaway. Most of the companies were privately held when Berkshire purchased them, and Buffett purchased them in private deals that rarely involved investment bankers. At times, Buffett ventured even further from his original investment strategy. He took a position against the U.S. dollar through futures contracts, and he made his first venture outside the U.S. by purchasing an Israeli company.

Buffett initially gained fame and fortune by purchasing stocks at attractive prices and became known as the Oracle of Omaha. But he changed the details of his investment strategy over time to adapt to changing markets and eventually became the world's second richest person.

GENIUS CAN FAIL

Long-Term Capital Management was an investment partnership, or hedge fund, formed in March 1994 by some individuals who were prominent in the financial services industry.

LTCM, whose story is told in *When Genius Failed: The Rise and Fall of Long-Term Capital Management* by Roger Lowenstein (New York: Random House, 2000), had a fairly simple strategy, known as *arbitrage*. The basic theory of arbitrage is that prices of assets tend to have historic relationships to each other. For example, high-quality corporate bonds usually offer a higher interest rate than Treasury bonds because of their additional risk. Corporations can go bankrupt, but governments are unlikely to. Except for extreme and

short-lived instances, the yield difference is within a certain range. LTCM created databases and computer models that would look for those extreme and short-lived instances when two assets were trading outside of their historic relative value range. After spotting an anomaly, the fund would place investments that would become profitable when the relative values returned to their normal range.

The basic arbitrage strategy would be enhanced in a couple of ways by LTCM. First, LTCM used an extraordinary amount of debt or leverage in its portfolio. Instead of investing only with the money it raised from investors, LTCM would borrow additional money and invest that. This was necessary to increase returns, because the potential profit from most arbitrage opportunities is quite small. To earn a good return on investors' capital, leverage was needed. Most arbitrage operations borrow from 100 percent to 300 percent of their invested capital. LTCM borrowed 10 times and more of its invested capital.

Second, LTCM expanded arbitrage trading into assets that had never before been subject to it. It drifted from the big, liquid market of bonds, usually bonds of governments around the world, into more obscure and less liquid assets for which the history was less reliable and the markets less efficient.

The LTCM strategies were based on a simple premise: Markets are relatively efficient. Inefficiencies appear from time to time. But they are temporary and must soon be corrected. By using computer power and trading models to compute the true value of different investments, LTCM believed it could identify inefficiencies first and buy undervalued assets and sell short overvalued assets before others identified them. Later, it would sell the investments for a profit.

LTCM's first big mistake was not to anticipate competition. While the firm did not disclose its specific trading actions, its general approach to the markets was well known. After all, some of the key partners were professors who had widely published their theories

for decades, and the traders at LTCM previously were prominent at other firms.

Once LTCM started to show good results, other Wall Street firms implemented their own variations of the theories. That meant fewer opportunities for LTCM, and the opportunities it did find were less profitable.

LTCM probably made its biggest mistake believing that investing is all science; that there is no art or judgment involved. The firm based its investment positions on computer analyses of market history. The firm concluded that the historic valuation ranges of different assets and the relationships between different assets were normal and would change only for very brief periods. They believed that the markets would not have what the professors referred to as a *10-sigma event*. (Sigma is the Greek letter that statisticians use to represent standard deviation, or volatility. Stock market returns generally fluctuate in a range of two to three standard deviations, or sigmas, from their long-term average return.) They did not believe there were periods when investors became extremely emotional and irrational and remained that way for a while.

Market anomalies, unfortunately, do occur and can persist for a while. Through most of 1998, market conditions were happening that "couldn't happen" according to history. The Russian debt default in the fall of 1998 triggered a market panic, resulting in a 10-sigma event. Even an extreme market anomaly such as that is not a problem if the investor can simply hold on until a reversal eventually comes. It even can be profitable if one has the cash and courage to invest during the panic. But if the investor needs the money that is invested, or if the investments were made with a lot of debt, then the investments must be sold at the worst possible time. In LTCM's case, because of the amount of debt it used to purchase the investments, positions had to be sold after prices fell below certain levels. But buyers could not be found. As Lowenstein wrote, "The

professors overlooked the fact that people, traders included, are not always reasonable."

The investment markets failed to follow the rules and models that LTCM had developed. "The mathematicians had not foreseen this. Random markets, they had thought, would lead to standard distributions—to a normal pattern of black sheep and white sheep, heads and tails, and jacks and deuces, not to staggering losses in every trade, day after day after day," wrote Lowenstein. LTCM eventually was bailed out by a consortium of banks put together by the Federal Reserve Bank, and the original partners lost most of their wealth. The lesson learned by one of the key partners whose models had failed was that more elaborate and sophisticated models were needed.

FOXES AND HEDGEHOGS

The late philosopher Isaiah Berlin wrote an essay, famous in its field, titled "The Hedgehog and the Fox." The essay is an analysis of Russian writer Leo Tolstoy's philosophy of history. The details of the essay are not relevant to investing, but the essay's introduction contains an insight that explains the difference between Tiger Woods, Billy Beane, Warren Buffett, and Steven Cohen on the one hand and Long-Term Capital Management on the other. This insight also describes the difference between many successful investors and investment strategies on the one hand and less successful investors and strategies on the other. The insight points the way to becoming a better investor.

Berlin credits 7th century BCE Greek poet Archilochus with the expression: "The fox knows many things, but the hedgehog knows one big thing." This expression captures, according to Berlin, "one of the deepest differences which divide writers and thinkers, and, it may be, human beings in general."

On one side of the divide are the hedgehogs. These thinkers relate everything to a single vision. They view everything through one central, organizing principle and base everything they understand, think, and feel on that principle. On the other side of the divide are the foxes. They pursue many ends and think and act on many levels. Foxes use a vast variety of experiences and do not try to fit them into one unchanging, all-embracing principle. Or to view it another way, foxes are cunning and eclectic in their thinking and perhaps inconsistent at times. Hedgehogs are dogged, persistent, and very consistent.

Is one way of thinking and making decisions better than the other?

In *Expert Political Judgment: How Good Is It? How Can We Know?* (Princeton: Princeton University Press, 2005), psychologist Philip E. Tetlock tries to identify the better decision-making system. Over several decades, Tetlock and other researchers asked experts to make forecasts. The experts and forecasts generally were related to foreign affairs and international politics. In addition to compiling and determining the accuracy of the forecasts, the researchers also compiled details about the experts. Data was compiled on the backgrounds, philosophies and other characteristics of the experts, including how they thought and made decisions.

The results are counterintuitive. An expert's education, professional background, status, and similar factors did not aid accuracy. The expert's philosophy or core beliefs also did not improve accuracy. In other words, liberals were not more accurate than conservatives; optimists were no better forecasters than pessimists; and realists did not perform better than what Tetlock calls *institutionalists*. None of the factors that most people expect would be clues to a forecaster's accuracy turned out to be useful in identifying the better forecasters.

The key to identifying better forecasters turns out to be Berlin's framework of hedgehogs versus foxes. As Tetlock puts it, "*What*

experts think matters far less than *how* they think." The foxes among the surveyed experts turned in more accurate forecasts than the hedgehogs by a sizeable measure. In addition, the long-range forecasts of the foxes were far more accurate than their short-term forecasts and much more accurate than the long-range forecasts of the hedgehogs. The hedgehogs "knew one big thing" and tried to fit new events and a dynamic world into that view. The foxes looked for ad hoc solutions that were consistent with the many little things they knew and that fit the rapidly changing world.

Another factor that helped the foxes is that they were more willing to admit mistakes in prior forecasts and not to make excuses for them. Instead, they would use a point-counterpoint style to analyze what had happened and adapt new forecasts to those observations. The foxes were more self-deprecating. The hedgehogs were more likely to make big mistakes and would build up excessive enthusiasm for their forecasts.

A Better Way to Think

Tetlock identified six basic ways in which foxes and hedgehogs differed from each other. As we shall see in this book, many of these differences also are likely to separate successful investors from the rest of the pack. The basic differences are:

- Foxes are more skeptical of the usefulness of "covering laws" for explaining the past or predicting the future. Covering laws are those big, central principles that seek to explain many things.
- Foxes are more wary of simple historical analogies.
- Foxes are less likely to get swept away in their own rhetoric.
- Foxes are more worried about our judging those in the past too harshly (and less worried about those in the future judging us harshly for failing to see the obvious).

- Foxes see more value in keeping "political passions under wraps."
- Foxes make more self-conscious efforts to integrate conflicting theories, beliefs, and observations.

Despite the advantages foxes have over hedgehogs, Tetlock did not give them unqualified support. He concluded: "Foxes are not awe-inspiring forecasters: most of them should be happy to tie simple extrapolation models, and none of them can hold a candle to formal statistical models."

It also is worth noting that, of course, not every expert could be classified as either a fox or a hedgehog. There is a linear scale from fox to hedgehog, and many experts fall somewhere along the scale as hybrids of the two rather than as a pure fox or hedgehog. But Tetlock's research found that the closer an expert is to the characteristics of a fox, the better the forecasts were.

We can see how Tiger Woods is a fox.

While at the top of his personal game and his sport, Woods worked hard to make radical changes in his golf swing—twice. He displayed the modesty that Tetlock found is common among foxes. He was regarded as the best, yet he looked for ways to improve. Woods also apparently did not view one aspect of his swing or the golf game as the key to success. Finally, he adapted and changed. Woods realized that his competitors were getting better. In particular, he concluded that to remain at the top he would have to learn to hit longer tee shots. Instead of insisting that the way he played was the right way, Woods took a more objective view and decided on the changes that were needed.

We saw the same pattern from Billy Beane and Steven Cohen. After achieving success with one strategy, each realized that adjustments had to be made. Beane changed the details of his approach, using different criteria to identify quality ball players available at

relatively low salaries. Cohen made a bigger adjustment, moving from an investment strategy of quick trading that ignores company fundamentals to one with longer holding periods that analyzes fundamentals.

Warren Buffett likewise changed his investment strategy more than once as the markets changed. At first, he primarily searched for stocks whose prices had been beaten down by market or company events and were cheap. As cheap stocks became less numerous and as he learned more about the markets and investing, Buffett began to search for companies with coveted franchises that he understood and believed were protected. As time went on, Buffett's strategy changed again. He turned his investment vehicle, Berkshire Hathaway, into a major insurance company by acquiring a number of insurers. Also, instead of purchasing portions of publicly traded companies he bought entire companies and owned them as subsidiaries of Berkshire Hathaway.

Yet, there is a bit of a hedgehog in Warren Buffett. At one point in the 1960s he shut down his original investment partnership because he could not find enough stocks that met his investment criteria. Later, throughout the great stock bull market of the 1990s, especially the late 1990s, Buffett's investment returns lagged the market indexes. The bulk of the gains generated by the indexes during that period came from large company growth stocks, especially technology stocks. Buffett maintained that he did not understand technology and would not invest in anything he did not understand. Even his friendship with Bill Gates of Microsoft could not sway Buffett from his stand on technology stocks. While Buffett's steadfast position on technology stocks helped him avoid the worst aspects of the post-1999 market decline, it still excludes a large and fast-growing segment of the economy and stock market from his portfolio.

The managers at Long-Term Capital Management were classic, pure hedgehogs. They established as a lodestar that the investment markets

are fairly efficient, and that any inefficiencies would be short-lived. A corollary belief was that past relationships between investments represented efficiency, so price relationships outside the normal range were bound to return to normal. Their theory had no room for changes in investor behavior that would alter historical relationships. Even as events unfolded, they were unwilling to consider the possibility their theory was not working as projected. The strategists learned one big thing and expected all events to fit within that big thing.

INVEST LIKE A FOX, NOT LIKE A HEDGEHOG

Investment markets are dynamic. They always are changing. An investment market reflects the interactions of millions of humans. People learn over time and adjust their expectations and behavior accordingly. Some aspects of the investment markets are consistent over long periods of time—so far. Over shorter periods, however, long-term relationships often do not hold up. Investors must adapt their investment strategies to capture the dynamism of the investment markets or they will earn lower returns than they should and perhaps suffer large losses. The probability of investment success is greater for foxes than for hedgehogs.

Hedgehogs can be successful investors. But their timing must be right. They must adopt the "one big thing" investment principle at the right time, when that principle is consistent with market trends that are in their early stages. They also must exit the markets at the right time.

Too often, the timing of investment hedgehogs is wrong. They mine the data of investment and economic history to discern patterns and relationships. Then, they develop an investment strategy. That usually is about the time that the dynamism of the markets takes hold. It is a fairly good bet that if there is enough data to discern

a pattern or rule for investing, the pattern is about to change and the rule soon will be invalid. (For now, we will skip over the tendency of hedgehogs to draw their rules and conclusions by examining time periods that are too short or that have unique characteristics.)

Investment history is littered with strategies that worked on paper using historical data yet failed to continue working. There is little doubt that most individual investors earn lower returns than they could. Some of the shortfall in returns is due to poor investment discipline. Too many investors chase fads, headlines, and recent past returns. They also trade too often and pay too much in expenses and taxes.

Yet, even many investors who are disciplined and who consistently follow rational strategies earn lower returns than they should, and often that is due to their being hedgehogs. These investors learned "one big thing" about investing and stuck with it. For a while the strategy works, but in time the dynamism of the markets puts their portfolio and its strategy out of sync with investment trends. Many investors are serial hedgehogs. They grasp an investment theory based on one big thing. After a period of poor returns, they discard the theory. But they adopt another strategy based on the next one big thing.

Many hedgehogs adopt their investment strategies because data show the strategy has worked well over a period of time. That might be true, but there are two issues to explore before deciding to follow the strategy to which the data points.

As I have emphasized, markets are dynamic. The aspects of the market that made the strategy so effective in the past might no longer be present. A quick example is the dividend yield on the major U.S. stock indexes. For many years a widely respected and profitable practice among investors was to increase allocations to U.S. stocks whenever the dividend yield exceeded 6 percent or 7 percent. Stocks were considered bargains when the yield was in this range

and were likely to earn above-average returns in the following years. The corollary was to reduce stock holdings when the dividend yield fell below 3 percent. This strategy increased returns and reduced risk over many years.

But the markets changed. Investors became less interested in dividends, and many companies chose not to pay dividends. The dividend yield fell below three percent and has remained there. Despite the low dividend yield, the stock indexes rose through the 1980s and 1990s. Anyone who continued to follow the dividend yield strategy missed the best years of the great bull market.

Another issue to explore is how the strategy fares in shorter periods than the very long term. Most of us cannot wait for the long term to make a strategy profitable. Our investment horizons are shorter than that. For example, we might need to accumulate investment capital by retirement age, and then we start to spend the money. Most of us also do not have the patience or fortitude to endure a decade or more of paltry returns without losing faith in a strategy. Many financial and retirement plans simply cannot be successful if investments experience an extended period of below-average returns, regardless of the prospect for long-term returns.

People, especially investors, want to be hedgehogs. They long for simple rules that explain things and that can be used to develop simple approaches to life. This yearning has been true since at least as far back as the Book of Job. As recorded in that book, Job was blameless. God allowed Satan to inflict terrible things on Job to prove his faith. While Job wondered why God would do these things to him, Job's friends insisted that these things could happen to Job only because he and his family had committed great sins. They believed in the simple rule that bad things only happened to people who did bad things. Despite the evidence of Job's blameless life and though they had no evidence of sins committed by Job and his family, they insisted Job must have been a great sinner. We know they were wrong, and later

in the book God told them so. Job's friends were classic hedgehogs and clung to simple rules for as long as they could.

The search for simple, universal investment strategies often results in significant losses of capital. Yet, because of the natural inclination to desire such solutions, investors continue to search for hedgehog strategies.

THE SEARCH FOR PATTERNS

Investment professionals often refer to the search for rules as data mining. Professional and amateur investors alike search historic market and economic data for clues to investment success. Within the data the investors look for patterns—series of events that seem to recur in similar fashions. Sophisticated institutional investors use computers and elaborate mathematics to discern patterns. Investors with fewer resources use a more intuitive process.

Before converting a pattern into an investment rule or strategy, consider some common traps that snare people in this endeavor.

- Random events are easy to confuse with cause and effect. There are numerous actions and events that influence markets and investor behavior. By focusing on a few events and the subsequent market results, a person can conclude that there was a cause and effect or that certain decisions led to certain results.

It is easy to find patterns in what are in fact random events. If a computer is asked to generate randomly a series of one and zeros, at some point patterns would be observed in the output. Perhaps there will be instances of six zeroes preceded by three ones. There is no cause and effect, because the computer is randomly generating the data. But someone simply analyzing the output could see patterns and conclude there is meaning behind them. Likewise, many

clever and diligent people have sought to find relationships between the investment markets and Super Bowl results, women's fashion, various cultural trends, and astrology. These efforts are in addition to those that seek to find more rational relationships between investments and interest rates, inflation, or economic growth.

Finding patterns in random events, being "fooled by randomness," is the very subject of Nassim Nicholas Taleb's *Fooled by Randomness: The Hidden Role of Chance in Life and in the Markets* (New York: Texere Thomson, 2004). The book explains how people expect the world, especially the markets, to be linear and predictable. In fact, it is random and unpredictable over any short period.

• Deciding which variables to focus on is another obstacle to those seeking to define an investment strategy. Since investment markets are composed of millions of people making decisions, anything that affects an individual's decision should be considered. No one has the resources to consider all potential variables. So, hedgehogs seeking to discern investment rules must begin by excluding many variables. Yet by excluding variables, the search for patterns is likely to find false patterns and casual relationships.

The variables that affect investment markets are so numerous that using the past to discern the future is an impossible task. The circumstances are different each time, because the variables are too numerous. The situation is never the same as it was in the past.

• An investor must accept that the unexpected, the unlikely, and even the impossible event will occur. Investment markets tend to have what the statisticians call *fat tails* or outliers. Most activities, when graphed, show a normal distribution. In the normal distribution, most results are bunched near the median result. Only a small number of results are far from the median, and that portion of the graph is called the tail. Most graphs have skinny tails with very few results far from the median.

But most investment markets have fat tails in their graphs. A minority of the results is far from the median, but it is a significant minority of events. The frequency of these unlikely events cannot be ignored. For example, some people missed the last few years of the equity bull market of the late 1990s because there never had been a period when the major market indexes increased at least 20 percent each year for more than three consecutive years. Greater than 20 percent gains more than two consecutive years was considered unlikely. Yet, before the bull market was over, the Standard & Poor's 500 Index returned more than 20 percent for each of five consecutive years. Ignoring fat tails is one of the factors that led to the decline of Long-Term Capital Management. Taleb, in *Fooled by Randomness,* refers to such events as *black swans*, an expression for a phenomenon that is out of the common course. Their equivalent occurs in the investment markets with some regularity and investors must be prepared for them.

• The search for patterns in past data is highly dependent on the beginning and ending points used in the search. Numerous researchers have found that conclusions are changed when the time period tested is changed. One reason is that investment markets often have long-term cycles. Changing the time period includes or excludes a significant cycle. Another reason the date is important is one we already have discussed: numerous variables influence the markets. A variable might be dominant in one period but not in another. Still another factor is that public investment markets have existed for only a relatively short period of human history, and they have changed considerably in that time. Even if all available data are used, the time period might not be long enough to be considered statistically significant. If only a portion of the data is used, there likely is not enough data to generate reliable conclusions.

• Once a reliable investment rule is developed, it almost invariably stops working. A prime example is known as the January Effect.

Researchers in the 1970s and 1980s discovered that stocks often produced unusually high returns in January. Further research indicated that the returns were concentrated in the first half of January, especially in small company stocks. The research was published and widely discussed and followed. There even was a book written on the January Effect.

Suddenly, the January Effect stopped working. The reliable above-average returns that could be earned by loading up on small company stocks at the beginning of January disappeared.

This is not an unusual turn of events. Once a pattern is well established it ceases. Perhaps this is because it really was just a random pattern, not something that was going to be repeated. It also is likely that as people learned about the pattern and changed their behavior, the behavioral changes also changed the pattern.

Investment markets are not subject to unchanging laws of nature that are found in physics, engineering, chemistry, and some other fields. Investment markets consist of human beings acting. People tend to learn, change, and adapt over time. They respond differently to what might seem to be the same events each time they occur. And the occurrences never are exactly the same, partly because people are learning and partly because all factors are not exactly the same.

• A final consideration for hedgehogs is that even when a pattern appears, in the investment markets there never is a 100 percent correlation between factors. There might be a high probability that certain occurrences will lead to certain results. But with a probability of less than 100 percent, it rarely is safe to invest an entire portfolio according to the rule. There will be periods when the rule will not work. Though rare, the occurrences could lead to losses high enough to more than offset the gains from the periods when the rule does work. One investment advisor used to say that the best investment rule was to assume that a rule would stop working after you start to use it.

In this book we explore these topics in more detail. In Chapters 2 and 3, we examine some hedgehog strategies investors have been encouraged to follow and that have been widely adopted. We see when they work and when they stop rewarding investors, and we explore why the strategies are not effective over the long term. In Chapter 4, an explanation of the investment markets—their foundation and framework—makes clear why investors need to think like foxes if they hope to be successful in the long term. Chapter 5 takes that framework from theory to practice by using it to explain changes in the U.S. stock markets. Chapter 6 details how to—and how not to—implement an investment strategy for foxes and to think like a fox. In Chapter 7, we discuss some investment mistakes investors are prone to make, whether they are foxes or hedgehogs. Finally, in Chapter 8, we look at new investment tools and how they can enhance the portfolios of investors who think like foxes.