Chapter 1

Wrapping Your Brain around Technical Analysis

In This Chapter

- Understanding the basic principles of technical analysis
- Recognizing how market sentiment and crowd extremes influence trading action
- Choosing indicators that match your analysis style
- Using optimization to refine your indicators

Get ready to suspend belief in everything you think you know about trading and investing. Technical analysis, a set of forecasting methods that can help you make better trading decisions, focuses on the price of a security rather than the fundamentals of the company behind the security. In technical analysis, you observe how prices actually move and try to use past regularities in price movements to predict future regularities. Basically it's a way of charting price trends so that you can make rational trading decisions that bypass greed, fear, and the other emotions that often accompany trading.

Technical Analysis Defined: Observing Prices Directly

Technical analysis is the study of how securities prices behave and how to exploit that information to make money while avoiding losses. Basically, with technical analysis, you work to identify price trends (a *trend* is a discernible directional bias in the price — upwards, downwards, or sideways). Following are the basic observations underlying technical analysis:

- Securities prices move in trends much of the time, and trends remain in place until some major event comes along to stop them.

Prices incorporate (or *discount*) all known information about the security, and prices change as new information becomes available. *All known information* consists of hundreds of factors ranging from accurate facts to opinions, guesses, and emotions — and previous prices. They all go into the supply and demand for a security and result in its price.

- Trends can be identified with patterns that you see repeatedly and with *support and resistance* trendlines (both are covered in Chapter 4).
- Primary trends (lasting months or years) are punctuated by secondary movements (lasting weeks or months) in the opposite direction of the primary trend. Secondary trends, or *retracements,* are the very devil to deal with as a trader. See the later section "Retracements" for details.

Your goal is to forecast the price of the security over some future time horizon in order to buy and sell the security to make a cash profit. The emphasis in technical analysis is to make profits from trading, not from owning a security as some kind of savings vehicle, although long-term investors use technical analysis as well.

Charting course

Because in technical analysis prices and trends rule, you have to be able to track and identify them. Although technical analysts have developed numerous indicators based on price and volume that can be expressed as statistics, tables of numbers, and other formats, you'll spend most of your time looking at charts, like the one shown in Figure 1-1 which illustrates a classic uptrend following a downtrend.

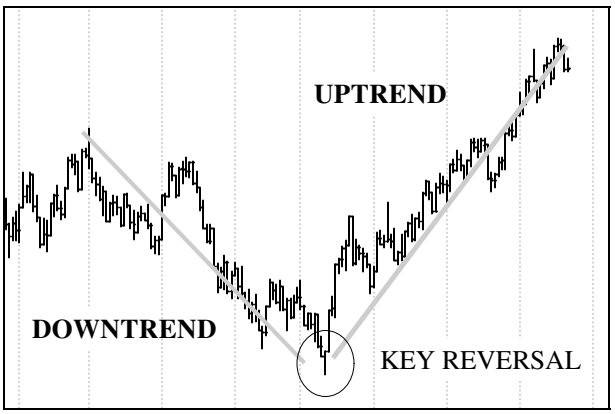

Figure 1-1: Uptrend and downtrend.

At the most basic level, your goal is to shun the security shown on the chart while it's downtrending and to identify the key reversal point — which is the best place to buy — as early as possible. To do this successfully, you absolutely, positively must become attuned to looking at charts and trying to figure out what the prices are telling you.

A chart is the workspace of technical analysis. Technical analysts have developed numerous indicators based on price and volume that can be expressed as statistics, tables of numbers, and other formats, but the core method remains a graphic display of prices on a chart.

Uncovering the essence of market movements

Securities are different from cars, bread, and socks. You don't buy a security for the joy of owning it and using it. The main reason to buy a security is to sell it again, preferably for more than you paid for it.

In securities trading, the pricing process is more like an auction than the traditional *price-discovery* process of classical economics, in which demand for an item depends on its price: If something is rare, it's expensive. At higher and higher prices, demand falls off. At some point, the high price induces suppliers to produce more of the thing, whereupon the price falls. The price-discovery process can be lengthy.

In auction economics, demand *increases* as the price rises. The item may or may not be scarce in the real world — it doesn't matter. The immediacy of the auction is what skews prices, sometimes to absurd levels. Later, when suppliers see the high prices, they may indeed be able to find or produce more of the item — but by then, the specific demand dynamic of that one auction is gone.

When you decide to buy a security, it's because you think the price will rise. When you decide to sell, it's because you have a juicy profit that meets your needs, or because you have taken an intolerable loss. You seldom think about the true supply of the security. And, in fact, while the supply of any security is limited by the number of shares outstanding and the like, supply may be considered infinite for all practical purposes, because a price exists at which you can induce someone to sell you what you want.

In technical trading, think of demand for a security as rising on rising prices, not falling ones. Similarly, the supply of a security dries up on rising prices, at least in the short run.

Figuring Out What's Normal: Drawing a Market Profile

Technical analysis can be categorized broadly as falling into four categories:

- Analyzing patterns (double tops ands bottoms, for example; see Chapter 4)
- Trend-following methods (moving averages and trendlines, for example; see Chapter 4)
- Character-of-market analysis (oscillators like Relative Strength Indicator [RSI], for example)
- Structural theories

Structural theories include the broadest measures of market behavior, like seasonality (which I discuss later in this chapter). The most inclusive of the structural theories is market profile.

Each crowd, whether a fraternity or a gang, develops criteria for normal behavior. The secret vocabulary of traders in a specific security or class of securities takes the form of prices changing by a certain amount over a period of time (usually one day, one week, and one month). The crowd that trades a specific security, for example, knows that the average daily range of prices between the high and low of the day is normally some specific amount.

Market profile is a technique for analyzing the normal behavior of the crowd while in the process of trading a security. Using a fictitious security, Figure 1-2 shows trading during a particular day. Each X stands for blocks of shares traded. All the Xs add up to the volume figure for the day — the number of shares or contracts traded, as reported by the exchange. The number of shares or contracts is recorded according to the price associated with them and the time of day the transactions took place.

As you can see, the price ranged from $8 (the low) to $11 (the high) on that day, with the average price at $9.50. (Note that in this instance, the arithmetic average is the same thing as the *mode,* which is the price that occurs most frequently. This isn't always the case, and if you pursue this method of looking at markets, you'll have to deal with situations where the average differs from the mode.)

Turn the page sideways. Do you see the outline of a shape in this price distribution? If you've ever sat through a statistics class, you may be able to pick out the bell-shaped normal distribution curve. It's called a *normal distribution* because you can use it to describe a set of data that varies around an average value.

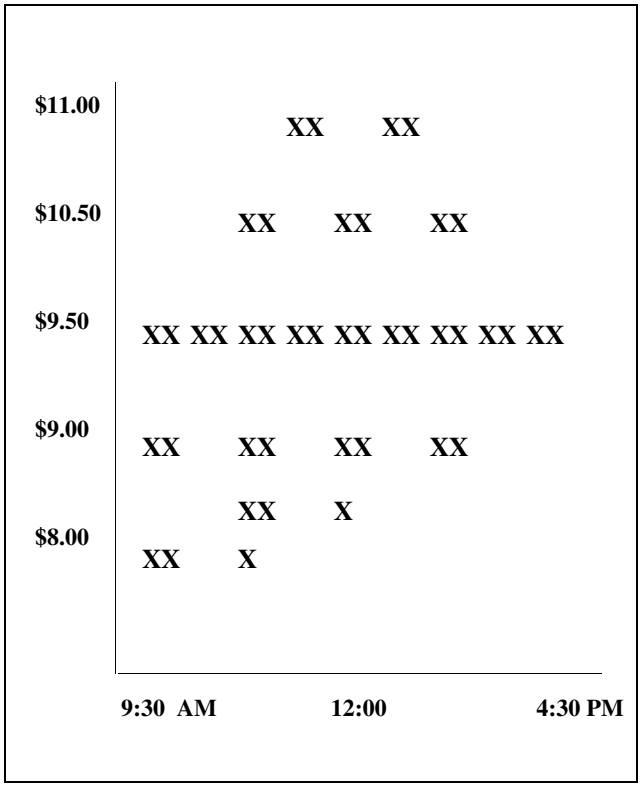

Figure 1-2: A market profile.

Explaining the standard deviation

Prices clustered around the average are *normal* and represent the market consensus of the rough equilibrium price for that day. The normal prices deviate by only one unit from the average in each direction: higher or lower. This unit is named a *standard deviation.*

The standard deviation region in Figure 1-2 is symmetrical — when you use a normal distribution curve, you assume that an equal number of prices will fall on each side of the average. This isn't always true, of course. Prices are trended at least some of the time, and so if the price is on a generally rising trend, expect to see the distribution curve skewed to one side, to the higher prices. You'll also see days on which the prices form a double hump or are just flat across the daily range.

Statisticians say that securities prices aren't actually normally distributed; they just look that way sometimes. You risk making unwarranted assumptions if you apply the normal distribution concept uncritically. Still, the main point of market profile is that you can often track crowd behavior as it is happening to determine whether bullish sentiment is winning out over bearish sentiment, or vice versa.

Trading normalcy

The prices that occur in the outer tails of the curve are, statistically speaking, abnormal. In the example in Figure 1-2, only about one-third of prices stray so far away from the average.

Say that, after writing down each trade on a chart, you see that early in the day, the price moves from $8 to the average, $9.50, *which is still in the process of being established.* Only a few prices have appeared on the high side of the price range. From studying past days and weeks of data, you already know that the average daily trading range of the security is $3. (See Chapter 2 for a discussion of the trading range.) You guess that if the trading is normal that day (consistent with the average over the past several days or weeks), you'll be able to buy under or near the average of $9.50 and sell near the expected high, $11. In fact, after you see that the trades are starting to average $9.50, if you see an offer at the cheap end of the range, $8, you jump on it, thus improving your net profit if you're able to sell at the high end of the range later in the day.

Using market profile to make trading decisions

Market profile isn't, technically speaking, a buy/sell indicator. It's a way of visually organizing price and volume data to give you a perspective on how traders feel over the course of the day. If you start entering a lot of entries down around $8 later in the day, for example, what you're seeing is a shift in sentiment to the bearish side. How you interpret that information is up to you. You have two choices:

- **Buy some more:** The market is temporarily undervaluing the security. You expect normalcy to return. You still expect to see the average at $9.50, and you still hope to see the price extreme of $11.
- **Sell:** Sentiment is going against you. When you see prices develop in the tail, you're seeing a price extreme. Price extremes are abnormal and can mark the beginning of a trend. In fact, a trending market is characterized by *fat tails,* meaning a lot of volume occurring at the edge of the normal price range.

Your choice depends on the information you're getting from technical indicators. For example, you can use market profile together with moving averages or momentum to estimate whether a trend is forming, weakening, or strengthening.

Crowd Extremes and What to Do about Them

Technical analysis is the art of identifying crowd behavior in order to join the crowd and take advantage of its momentum. This is called the *bandwagon effect.* Here's how a bandwagon works: A fresh piece of news comes out, a majority of traders interpret it as favorable to the security, and buying overwhelms selling so that the price rises. You profit by going with the flow. Then when everyone is jumping off the bandwagon, you jump, too.

A word about manias and panics

People behave differently when they act as individuals from the way they act when they're part of a crowd in which otherwise sensible individuals can behave in the most extraordinary ways. If someone shouts "Fire!" in a crowded theater, people will trample each other to get to the exits; if someone shouts "Free ice cream!" people will fall all over each other to be first in line. In markets, you see the same thing. Prices fall as traders abandon a security after bad news about it is released. If an authority figure pronounces the security a gem and a bargain, securities prices reach new highs as people flock to them. As a technical trader, you want to be sensitive to what the crowd is doing without succumbing to the ruling passions of the crowd itself.

A *mania* is a situation in which traders buy an object or security without regard for its intrinsic value or even whether they'll be able to sell it again later at a higher price. They fear being left out of an opportunity. They're caught up in the moment and temporarily irrational. A *panic* is the opposite — people can't sell the thing fast enough and will accept ever-lower prices just to get any money back at all.

In economic history, a mania or a panic comes along only a few times in a century. In the technical worldview, mania and panic happen every day, in miniature. Emotional extremes lead to price extremes in the context of the hour, day, or week — minimanias and minipanics occur all the time. Those aren't the words used in technical trading lingo, but the emotion and the price effects are the same as in big-picture manias and panics.

Technical traders work hard at not listening to chatter about securities, even from authority figures. You're unlikely to get useful information — and you may get *disinformation* (deliberately misleading information as some traders invent rumors to try to create a stampede in either direction). All the information you need is embedded in the price. When you do check the news for the cause of a price action, be sure to do so with a healthy dose of skepticism.

As market participants get excited about a security, they become increasingly bullish and either buy for the first time or add to positions, a phase named *accumulation*. When traders become disillusioned about the prospect of their security price rising, they sell, in a phase named *distribution.* To buy 100 shares of a stock is to *enter a position.* To buy another 100 shares for a total of 200 is to *add to your position.* If you have 500 shares and sell half, you would be *reducing your position.* To sell all the shares you own is to *square your position.* When you're *square* (also called *flat*), you have no position in the security. All your money is in cash. You're neutral.

After traders have been accumulating the security on rising prices, eventually the price goes too far. *Too far* is a relative term and can be defined in any number of equally valid ways, but basically it means any price extreme that's wildly abnormal, statistically speaking.

Overbought and oversold

When a price has reached or surpassed a normal limit, it's at an extreme. In an *upmove,* everyone who wanted to buy has already bought. The market is called *overbought,* a term specific to securities trading. In a *downmove,* everyone who wanted to sell has already sold. The security is called *oversold.* The concept of overbought/oversold is applied to market indices as well as individual securities. It's usually measured by the momentum indicators described in the section "Examining how indicators work," later in this chapter.

By the time most of the market participants have jumped on the bandwagon, it has become so heavy it can't move forward. Traders are tapped out. All their money is in a position. Traders have to square their positions just to put cash back into their pockets so they can conduct additional trades.

Retracements

When a price has gone too far and traders deem the security overbought or oversold, the price stops rising or falling. Instead of hovering at a particular level, however, the price moves in the *opposite* direction for a while. A move in the opposite direction of the main trend is named a *retracement.* (Other names for it are *correction,* which explicitly recognizes that the security had gone too far and is now correcting course, *pullback,* or *throwback.)*

Recognizing a retracement

Prices seldom move in one direction for long. Even a major trend exhibits retracements. When the market runs out of cash, traders have to close positions to get their cash back so they can put on new trades. If they've been buyers, they need to sell. If they've been sellers (shorting the security), they need to buy. Position squaring always causes a price move in the opposite direction of the trend. Therefore, at the extreme outside limit of a price move, you should expect a temporary, minor reversal of the previous price move. In an uptrend, a retracement is always a drop in price. In a downtrend, a retracement is always a rise in price.

Figure 1-3 shows a primary trend with several retracements, each outlined by an ellipse. In this instance, the retracements last only a day or two — but retracements can last a lot longer, several weeks on a daily chart, for example. They can also retrace over more ground.

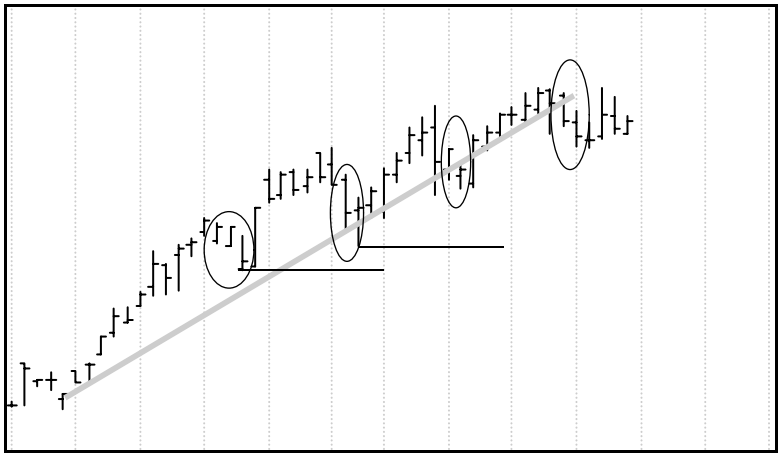

Figure 1-3: A trend with retracements.

At the time a retracement starts, you don't know for sure that it is a retracement. For all you know, it could be a full reversal, with the price switching direction. This is one of the occasions when it pays to check the *fundamentals* (the news and events pertaining to the security). An ordinary retracement caused by normal position squaring can suddenly turn into a full-fledged rout in the opposite direction if fresh news come out that seems to support a reversal.

Catch a falling knife: Estimating when a retracement will end

To try to estimate where a retracement will stop is called "to catch a falling knife." Unfortunately, no reliable rules exist to tell you where a trend correction will end or when the primary trend will resume. One of the chief uses of indicators and combined indicators is to get guidance on where and when a retracement will stop.

Your tolerance for retracements is the key to deciding what time frame you want to trade in. If the security you want to trade regularly retraces 50 percent and the prospect of losing 51 percent turns you into a nervous wreck, you need to trade it in a shorter time frame — or find another security.

Acknowledging that no one can forecast a retracement hasn't stopped technical traders from trying to establish forecast rules. The following rules are generally helpful, but no one can offer statistics to back them up, so take them with a grain of salt:

- **A retracement won't exceed a significant prior high or low.** In Figure 1-3, for example, the second retracement doesn't challenge the lowest low of the first dip, and the third retracement doesn't challenge the second.
- **Look for round numbers.** Research shows that support and resistance levels (see Chapter 4) occur more often at round numbers than chance would allow.
- **The 30 percent rule.** Measure the percentage change and assume that a majority of traders will place stops to avoid losing more than *x* percent, such as 30 percent. The problem with this idea, and it's a chilling one, is that you're measuring from a peak and you don't know the price level where the majority of traders entered.

Looking at Market Sentiment

In technical analysis, sentiment comes in only two flavors — *bullish* (the price is going up) or *bearish* (the price is going down). At any moment in time, a bullish crowd can take a price upward or a bearish crowd can take it downward. When the balance of sentiment shifts from bullish to bearish (or vice versa), a pivot point emerges. A *pivot point* is the point (or a region) where an upmove ends and a downmove begins (or the other way around). At the pivot point, the crowd itself realizes that it has gone to an extreme, and it reacts by heading in the opposite direction. Another term for pivot point is *key reversal.*

When the crowd is reaching an extreme of emotion, it's usually wrong. A reversal point is impending. You should do the opposite of what the crowd is doing, or at least get ready to.

Tracking volume

Volume, the number of shares or contracts of a security traded in a period, is the most powerful confirming indicator of a price move, and *confirmation* is a key concept in technical analysis.

You can feel more confident that a price move has staying power if you know that many traders are involved in a price move and not just one or two. In technical trading, therefore, you use volume to measure the extent of trader participation. When a price rise is accompanied by rising volume, you have confirmation that the direction is associated with participation. Similarly, if you see a price fall by a large amount, but the change isn't accompanied by a change in volume, you can deduce that the price change was an aberration. Some trader made a mistake.

Leading the way with spikes

Volume sometimes leads price. The most obvious situations are when volume spikes. A *spike* is a volume number that is double or more the size of volume on the preceding days. Say volume has been running at 100,000 shares per day for several days or weeks and suddenly it explodes to 500,000 shares. If the price had been in a downtrend, this wild increase in volume means that the crowd is throwing in the towel and exiting *en masse.*

A volume spike is one of the occasions when fundamental information is complementary to a technical observation. In the case of a price making new highs coupled with a volume spike where you discover that no fresh news or fundamental information prompted new buyers to come on the scene, be wary. Chances are the top is in. If the security has new, legitimately exciting news and you can reasonably deduce that it attracted new buyers, you have a non-technical reason to ignore the usual spike interpretation.

Tracking on-balance volume

On-balance volume (OBV) is a running (cumulative) total of volume, calculated by adding the volume on days the price is higher than the day before and subtracting the volume on days the price is lower than the day before. The logic goes like this: At the simplest level, when the price closes higher than the day before, demand was greater than supply at each price level. Buyers had to offer higher prices to get holders to part with their shares. You can attribute *all* the volume on a higher-close day to net buying and *all* the volume on a lower-close day to net selling. Figure 1-4, which shows IBM stock, indicates daily prices in the top part, volume (in hundreds of thousands of shares) in the center, and the OBV indicator in the bottom window.

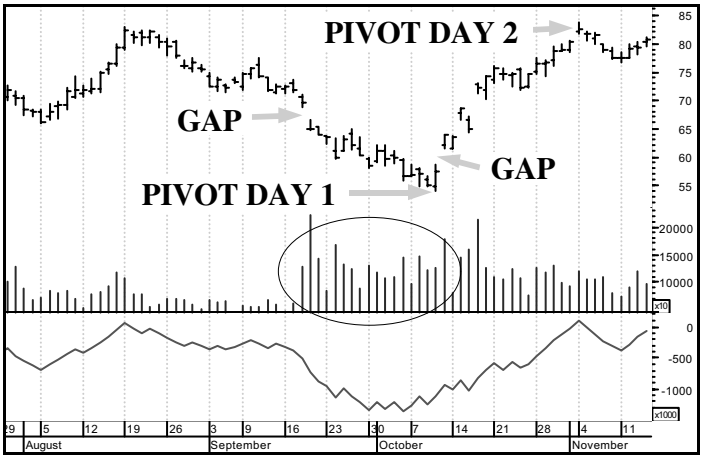

Figure 1-4: On-balance volume.

OBV doesn't work all the time, but a change in the indicator often precedes a change in the price. Using Figure 1-4, you can see how to use the OBV indicator in two instances:

- **The downmove:** The price downmove, already in progress, is suddenly accompanied by a big rise in volume. The increase in volume starts *the day before* the downward gap. A falling price punctuated by a downward gap is a message to the market that the price is going to fall some more. In this case, the OBV indicator forecasts the impending bottom. It starts to fall *ahead* of the volume spike and *ahead* of the gap. If you own the stock and see the OBV indicator start to decline and then you see spiky volume (like the area in the ellipse), you should sell. Holding on after the downward gap is courting a fat loss.
- **The upmove:** OBV reaches its lowest levels about two weeks *before* Pivot Day 1, which features the lowest low in the series of lower lows, but a higher closing price and a gap upward the following day. Notice that OBV is already rising while the price is still falling, a divergence that is a critical clue to an impending change in the direction of the price.

The divergence of price and an indicator that normally rises and falls in tandem with it is itself a wake-up call. A change in volume often predicts a change in price. The indicator is telling you something you can't see with the naked eye — prices were putting in new lows, but prices weren't consistently *closing* lower than the day before. Buying and selling pressure, or supply and demand, was reaching a balance. Your eye can see the price downmove, but the indicator can detect the exhaustion of the sellers (supply).

Notice that after Pivot Day 1, the price puts in several gap days upward. This is a message to the crowd to buy, and they do, leading to Pivot Day 2. If you had bought IBM at the close on Pivot Day 1 and sold it one day after Pivot Day 2 (when the OBV indicator turned downward), you would have made a nice little profit.

Refining volume indicators

It's not realistic to attribute *all* of the day's volume to the accumulation column just because the close today is higher than yesterday's. It makes more sense to attribute only a portion of the volume to the price rise. A more representative amount would be the percentage equivalent of the price that is above the midpoint of the day. A *midpoint* is calculated as the high of the day plus the low of the day divided by two.

If a security closes above its midpoint for the day, bullish sentiment ruled. The close over the midpoint defines *accumulation,* referring to buyers being willing to pay higher prices to get sellers to part with the security. The closer the closing price is to the high, the more bullish it was. If the price closed *at* the high, then you say that 100 percent of the volume can be attributed to bullish sentiment. A close below the price midpoint means *distribution,* sellers willing to accept lower prices to induce buyers to buy. Lower prices imply bearish sentiment. The closer the closing price is to the low, the more distribution there was. If the close is exactly at the midpoint, then the indicator has the same value as yesterday — you have no reason to add or subtract volume from the running total.

Understanding market effects

Some percentage of any security's price move (how much exactly nobody knows for sure) is attributable to changes in the market environment:

- **Securities:** Factors impacting price include not only the index to which a particular security belongs, but also its size (large cap or small cap, for example) and sector (biotech, high-tech, no-tech). About 25 percent of a price move in any single issue should be considered a function of what is going on in its index (or other benchmark to which the issue belongs).
- **Commodities:** Some portion of the price move in a commodity is a function of the price move of the overall commodity indices, like the Commodity Research Bureau index (CRB).
- **Currencies:** In currencies, the benchmark is something called the *dollar index,* a price average comprised of individual currency prices weighted by their countries' share of trade with the United States and published by the Federal Reserve.

Overall, the market environment has a magnetic effect on individual components. You may have the inside scoop on the best stock ever, but if the entire market has a case of the collywobbles, your best-ever stock is likely to fall, too. Conversely, when the market is in a manic phase, even the worst of stocks gets a boost.

To get a handle on possible market effects on your specific security, measure overall market sentiment by looking at market statistics. Strictly speaking, market statistics are not technical analysis, which is the study of how specific prices behave. Nevertheless, sentiment measures can be very helpful as a supplement and complement to work on your individual charts.

Sampling information about sentiment

Most sentiment indicators look outside the price dynamics of a particular security or index of securities for information about whether the trading crowd is humming along with expectations of normalcy or is willing to jump ship. Following are a few outside sources you can use:

- **Advisors:** A service called Investors Intelligence measures the balance of bullish sentiment against bearish sentiment (which it calls the *bull/bear ratio*) and claims an excellent track record in predicting turning points. You can find the bull/bear ratio and other indicators on hundreds of Web sites and in business newspapers. To get a specific bull/bear ratio from a specific vendor the minute it's published, you have to pay a subscription fee.
- **Breadth indicators:** *Breadth indicators* measure the degree of participation by traders in the overall market represented by an index, such as the Dow or NASDAQ. Breadth indicators include:
  - **The ratio of advancing to declining issues:** This indicator measures the mood of the market. Stocks that are reaching a higher price today than yesterday are called *advancing issues.* Stocks that are reaching lower prices are called *declining issues.* When advancers outnumber decliners, money is flowing into the market. Bulls are beating bears. Sentiment is favorable.
  - **The difference between issues making new highs and those making new lows:** If more stocks in an index are closing at higher prices than the period before, bullishness is on the rise. When a higher number are putting in new lows, supply is overwhelming demand and the mood is bearish.
- **Put/call ratios:** The Chicago Board Options Exchange (CBOE) is the venue for options trading in equity indices like the S&P and NASDAQ indices. The CBOE publishes the ratio of puts to calls. The *put/call ratio* is an indicator of whether sentiment is bearish or bullish. A high put/call ratio means bears are winning. The same line of thinking holds true for a low put/call ratio: When emotions are running strongly optimistic, watch

out for an opportunity to take advantage of a change. (Book III has more information on put/call ratios.)

- **Volatility index:** Use the volatility index (VIX) as a contrary indicator. When the crowd is feeling an extreme emotion, like anxiety, it's usually wrong. Therefore, a high VIX value means exactly the opposite of what it seems to mean — the bottom isn't coming, it's already in! When VIX is low, traders are complacent; they're projecting the same price levels, or nearly the same levels, into the immediate future with little variation and therefore little risk. When VIX is either abnormally high or abnormally low, you know it's the right time to trade against the crowd.

Accounting for seasonality

Seasonality (also known as *calendar effects)* refers to the natural rise and fall of prices according to the time of year. Heating oil futures go up as winter heads for Chicago, for example, and prices of agricultural commodities rise when the crop is poor and fall when farmers get a bumper crop. Interestingly, equities and financial futures exhibit a similar effect: They change according to the time of year. The changes are regular and consistent enough to warrant your attention. Here are a few:

- **Best six months rule:** Nearly all the gains in the S&P 500 are made between November 1 and April 30. This isn't true without exception, but it's been true for most years since 1950. When April 30 rolls around, you sell all your stocks and put the money in U.S. government Treasuries. Come November 1, you reenter the stock market.

Contrarians and cranks

A true contrarian is someone who has a *fundamental* reason for thinking that a security is mispriced. In equities, a fundamental reason could be insider knowledge that an out-of-favor pharmaceutical company has secretly discovered the cure for some important disease and its price will shoot the moon when the announcement comes out. In financial futures (stock indices, bonds, and currencies), a fundamental reason to judge a security mispriced may be an in-depth analysis of a central bank interest rate change that nobody else can see coming. A true contrarian is quite rare, although lots of people fancy themselves contrarians when they're just cranks. When a contrarian is right, he becomes a zillionaire and is called eccentric. When he is wrong, he stays poor and is called a crackpot. In contrast, technical trading is by its very nature non-contrarian. You want to go with the crowd, not against it (most of the time).

This advice comes from work on calendar effects by Yale and Jeffrey Hirsch, who tested the correlation of stock index prices with the time of year in their annual *Stock Trader's Almanac.* If you'd followed this rule every year since 1950, a starting capital stake of $10,000 in 1952 would have ballooned to $1,308,304 by 2003.

- **January Barometer:** When the S&P 500 is up in January, it'll close the year higher than it opened. Since 1950, this rule has an accuracy reading of 92.5 percent.
- **President's Third Year:** Since 1939, the third year of a presidential term is always an up year for the Dow. In fact, going back 84 years, the only big down year in the third year of a presidential term was 1931.
- **Presidential Election Cycle:** Wars, recessions, and bear markets tend to start in the first two years, while prosperity and bull markets tend to happen in the second two years. Since 1833, the last two years of a president's term produced a cumulative net gain in the Dow of 717.5 percent, while the first two years produced 227.6 percent.

You can discover the seasonality characteristics of any given stock by using *seasonality trackers* on various Web sites, including the best-known seasonality tracker, Thomson Financial (`www.thomson.com`). The Thomson Financial Web site allows you to see a chart of any stock with its associated average returns by month, starting in 1986. You can also see a table of the months in which the stock rose or fell over the years.

Searching for Historic Key Reversals

One of the enduring mysteries of market history is that big key reversal points come out of the blue. Seldom can you find a specific event that triggers a rally taking off or a bubble bursting. Does that mean that historic key reversals occur randomly? If so, why shouldn't we say that *all* key reversals occur randomly?

Opinion is divided on the answer, and many people give up on technical analysis at this point. If you never know when a major turning point is going to hit you over the head with a hammer, how can you trust technical indicators? The answer is that you can trust your indicators only up to a point, and then your survival as a trader depends on risk management. In the meantime, it's important to have a useful way to think about randomness and not let it overwhelm you.

Enduring randomness

Although the expectation is that prices will behave normally, random events can and do cause the occasional wild price departure from the norm. For

example, you sometimes see a price (named a *spike*) that is so far out of whack you don't know how to interpret it. A price spike is the equivalent of a tornado in weather forecasting. We know the conditions that cause tornadoes — we just don't know exactly when an actual tornado will develop.

Who would have thought, for example, that the S&P 500 could fall more than 20 percent in a single day? Most market observers used to say it was impossible. But that's exactly what happened on Black Monday, 1987. Most market tornadoes, like Black Monday, give plenty of technical warnings ahead of time. The problem is that those same warnings have existed during other periods and don't result in a Black Monday. This is an inconvenient fact of life that you have to accept.

Neither sentiment indicators nor standard technical analysis is much help in detecting the cataclysmic change from rally to crash.

Remembering the last price

In normal trading, you can assume that a wildly erratic price has a low probability of occurring, yet such events have an impact on future prices. In markets, a low-probability event changes the odds for the next period analysis. This is because traders remember and form their trading plans on earlier prices. The next price normally depends on preceding prices. Sometimes, all it takes is one or two abnormal prices to alter the expectations of the trading crowd. If they were bullish before, they become bearish now.

Using Chart Indicators

Technical traders go to great lengths to remove emotion and impulsiveness from decision-making. The chief tool for squelching emotion is the *indicator,* a calculation that you put on a chart to identify chart events, chiefly whether the price is trending, the degree of trendedness, and whether a trend turning point is being reached. The purpose of indicators is to clarify and enhance your perception of the price move. They come in two varieties:

- **Judgment-based indicators:** This group includes visual pattern-recognition methods such as bar, line, and pattern analysis, as well as candlesticks. Chapters 2 through 4 cover these methods.
- **Math-based indicators:** This group includes moving averages, regression, momentum, and other types of calculations; see Chapter 5 for the details.

Just because math-based indicators are based on math doesn't mean they aren't subjective. *You* determine the specifications of math-based indicators in the first place (such as how many days are in a moving average), and *your* specifications may contain preconceptions and bias. When you interpret trading guidance from math-based indicators, you're using judgment again. Math-based indicators may involve just as much personal judgment in design and application as outright judgment-based indicators.

Indicators are useful for identifying these five conditions:

- A trend is beginning (moving average crossover, pattern breakout).
- A trend is strong or weak (slope of linear regression or moving average).
- A trend is retracing but will likely resume (relative strength index).
- A trend is ending and may reverse (moving average crossover, pattern breakout).
- A price is range-trading (slope of linear regression or moving average).

Each indicator works best in one situation and less well in others. Technical traders argue the merits and drawbacks of indicators in each situation, and the indicator you choose for each task depends, to a certain extent, on the security and also on your choice of analytical time frame.

Choosing an analysis style

The trend is always the focus. In a perfect world, you first determine whether your security is trending or range-trading sideways, and then you apply the appropriate indicator. In practice, you can't always classify price moves as trending or not trending in a neat and tidy way. Besides, prices usually have an identifiable range, whether they're trending or not. In addition, retracements always create doubt — is it a momentary correction or a reversal?

Following are the types of analysis styles:

- **Trend followers:** Traders who like to identify trends may wait out retracements and sideways range-trading situations until they resolve back into a trend. Other trend followers use information from momentum indicators to modify their position, for instance by taking some profit when the security becomes overbought/oversold even though the trend is just pausing and they expect it to continue. (See the earlier section "Overbought and oversold" for definitions of these terms.) Figure 1-5 illustrates a trend, complete with minor retracements, and shows how a trend-following trader makes decisions.

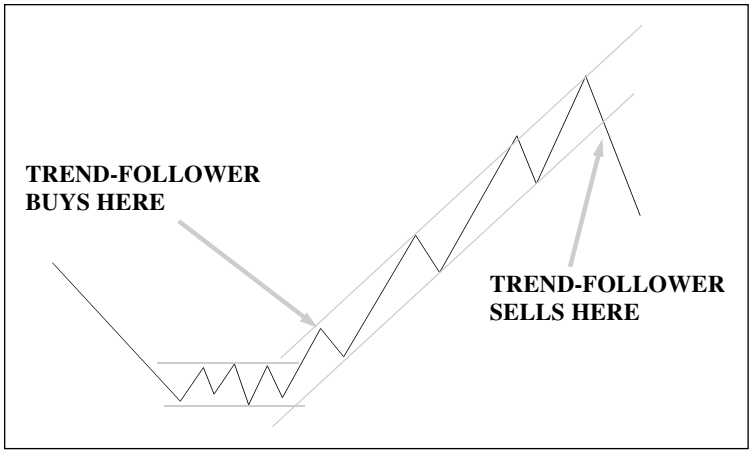

Figure 1-5: Trend-following.

If you choose trend-following, you're choosing to suffer through the downward bounce in an uptrend (or the upward bounce in a downtrend). You're going to wait it out, and if you have correctly identified the trend, your patience pays off and the trend resumes.

- **Swing traders:** Swing traders buy at relative lows and sell at relative highs, regardless of whether the price is trending. A swing trader may know that a price is downtrending, for example, but he's still willing to buy it for a short-term profit opportunity when a momentum indicator says it's temporarily oversold and likely to enjoy a bounce upward. Figure 1-6 shows how the swing trader tries to capture every move, including the retracements.

Your choice of trending or swing-trading indicators determines your holding period. Trending indicators generally keeps you in a trade for a longer period of time than swing-trading indicators.

The best guiding principles are the ones that relate directly to the supply and demand dynamics that *you* can see on the chart. This is why simple, old-fashioned techniques, such as bar reading and pattern identification, are so powerful.

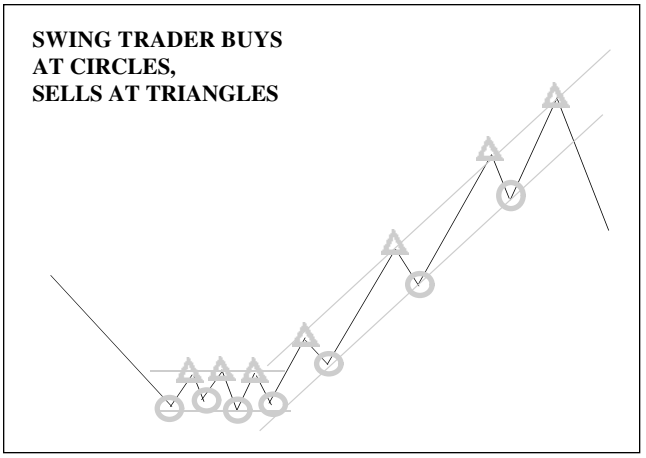

Figure 1-6: Swing trading.

Examining how indicators work

Indicators aren't inherently tied to particular time frames, nor do they have a single correct interpretation. The sections that follow describe the general way indicators work, but be aware that technical traders are mavericks and use indicators in an infinite variety of ways.

Finding relevant time frames

Most indicators measure price and volume changes relative to previous prices and volume over a specific *look-back* period, such as 12 days or 21 days. If you compare the trend-following chart in Figure 1-5 with the swing-trading chart in Figure 1-6, you can see that trend-following uses indicators with a relatively longer time frame than swing-trading indicators.

With the exception of "historic" highs and lows, most indicators have a range of time in which research shows they work best. (For more on historic highs and lows, see the "Establishing benchmark levels" section later in the chapter.) This is why charting software has preformatted indicators with default parameters specifying a particular time range. However, adopting the default parameter doesn't mean that you must trade according to that time range. Consider it a starting point; if the default doesn't work for you, use a different number of periods.

Most math-based indicators have an associated time frame, from very short-term to very long-term:

- **Intraday:** Entry and exit on the same trading day
- **Short-term:** 3 to 12 days (average 3)

- **Intermediate-term:** 12 to 45 days (average 20)
- **Long-term:** More than 30 days

The ability to apply an indicator over any time frame reflects the *fractal* quality of prices — the weird and wonderful fact that without a label, a price series of 15-minute bars often can't be distinguished from a month's worth of daily prices. Intraday bars are like microcosms of daily bars and daily bars are like microcosms of weekly or monthly bars. Traders respond to price changes in regular, consistent, and repetitive ways whatever the time frame.

Heeding indicator signals

Indicators are designed to give buy and sell signals, although in many instances, the signal is more like a warning and doesn't have a black-and-white embedded decision rule. The following list introduces signals to pay attention to:

- **Crossovers:** The term *crossover* refers to one line crossing another line. Crossovers include:
  - The price crossing a fixed historic benchmark.
  - The indicator crossing the price or the price crossing the indicator.
  - One line of a two-line indicator crossing the other.

  

  In most instances, the price crossing an indicator is named a *breakout,* one of the most important concepts in technical analysis. When a price rises above a long-standing resistance line, for example, technical traders say it *broke out* of its previous trading range and now the sky's the limit — until the new range is established. In an *upside breakout,* bullish sentiment triumphed, but bearish sentiment can win out as well. A breakout doesn't necessarily imply a trend reversal; sometimes a breakout is a confirming factor that the existing trend is gathering new momentum or passing new benchmarks.
- **Range limits:** *Oscillators* describe where today's price stands relative to its recent trading range. They're usually based on 100, so they range from 0 to 100, or minus 100 to plus 100, or some other variation using the number 100. In practice, traders find that most of the time, the scope of the price range falls well under the outer limits and doesn't vary by more than 20 to 80 percent of the total possible range. Thus, they draw a line at 20 percent of the maximum range and another one at 80 percent (or 10 percent and 90 percent, or some other variation). When the indicator approaches one of the lines, you know that the price is nearing an extreme of its recent range.

- **Convergence:** *Convergence* refers to two indicator lines coming closer to one another, as when a support line and a resistance line converge to form a triangle or two moving averages get closer together, indicating less difference between their numerical values. Convergence generally means that the price action is starting to go sideways or has a narrower high–low range, or both. A sideways move, in turn, generally leads to a breakout.
- **Divergence:** *Divergence* refers to two indicator lines moving farther apart, as when the spread between two moving averages widens. Divergence also refers to an indicator and the price going in different directions. Momentum indicators, in particular, reshuffle the components of the price bar to come up with the rate of change of a price, so that the slope of the indicator is a sophisticated measure of the strength of a trend. When the price is still rising (making new highs) as the momentum indicator starts to fall (making progressively lower highs), the price and indicator are diverging, which is an important leading indicator that the price rise is probably about to stop. (See Chapter 5 for more on momentum.)

Establishing benchmark levels

Every chart has historic highs and lows. Technically, they aren't indicators, and yet they may serve to indicate future price action. You've probably heard the phrases "52-week high" or "52-week low," meaning the security is reaching a one-year high or low. A new one-year high or low has no analytical value to the technical trader — unless it's also a historic high or low. A *historic* high or low is an absolute level that becomes a benchmark.

When a price makes a new historic high or low and then retreats in the other direction, years can pass before the benchmark is surpassed. In the meantime, intermediate highs and lows emerge and become benchmarks in their own right. At the time they occur, they seem historic. After a bounce up off a new low, traders hesitate to break it, but after they do, the price accelerates to the next low. The same thing happens on the way up to new highs. Profit-taking after a high causes the price to dip, and traders hesitate to breach the new "historic" high.

Hesitation ahead of the breach of a benchmark price can be prolonged and is often accompanied by a gap (see Chapter 2 on gaps), demonstrating that traders are aware of "historic levels."

Choosing and modifying indicators

Indicators only *indicate;* they don't *dictate* the next price move. According to the old joke, if you give 12 technical traders a new indicator, a year later you have 12 different track records. This observation is perfectly accurate, because *how* you use an indicator isn't set by the indicator itself, but by the trading rules you use. For example, you may like an indicator but find it generates too many trades in a fixed period, so you don't execute every single signal. Someone else may use the identical indicator, but instead of overriding indicator signals with personal judgment, he modifies the exact timing of trades by using a second indicator.

Overriding your indicator haphazardly is self-defeating. You're letting emotion back in. Plus, you won't get the expected result from the indicator — and then you'll blame the indicator. Modifying indicators with trading rules is *always* better than overriding them. Fortunately, most indicators are fairly flexible. They can be adapted to fit the trading rules you prefer, such as the frequency of your trades.

Indicators are about price-move measurement. Trading rules are about you and your tolerance for risk. Trading rules must be appropriate to the indicators you choose. So don't pick indicators that you can't follow, like a momentum indicator that gives ten trading signals per month when you don't have the time or inclination to trade that much.

Optimizing: The Necessary Evil

Optimization is the process of testing a hypothesis on historical data to see which parameter would've worked the best. Optimization is necessary because when you're starting out to trade a new security, you have no idea of what indicators to use or what parameters to put into the indicators. In keeping with the empirical approach of technical analysis, you want to try various indicators and different parameters in the indicators to see what works. As you optimize, however, keep these caveats in mind:

- The future *will* differ from the past. Price patterns repeat, but only in a general way. Any number of equally probable outcomes are possible in any specific situation. What worked in March 2000 may get disastrous results when applied in 2008 or 2016. It's hard to follow trading rules built on past patterns when you know the future will be different.
- Do you have the discipline to execute trades when your indicator tells you to? More to the point, do you trust the indicator? This is like asking whether you trust your own work developing the indicator parameters.

Take a look at Figure 1-7. The chart is of QQQQ, the tracking stock of the NASDAQ-100 Index (technically an exchange-traded fund that incorporates the 100 largest and most actively traded non-financial stocks on the NASDAQ). QQQQ more than doubled from March 1999 to the all-time high in March 2000. If you'd used a 50-day moving average crossover indicator to signal when to sell, you would have sold QQQQ seven days after the peak. Seven days — imagine the savings. (Fifty days is an oft-used parameter for the moving average, but you need to find out whether it's the best one for your particular security. Who knows? Maybe 36 days, 77 days, or some other number of days works better.)

Constructing a back-test optimization

The chart in Figure 1-7 displays a *back-test* (a test on historical data) of the single moving average crossover rule on IBM stock. Say you've dabbled in trading IBM stock on and off for a number of years, and you want to try your hand at applying an indicator-based technical trading rule. Here's the hypothesis: "If you buy IBM stock every time the price crosses above the *x*-day moving average and sell it every time the price crosses below the *x*-day moving average, it'll consistently and reliably be a profitable trading rule."

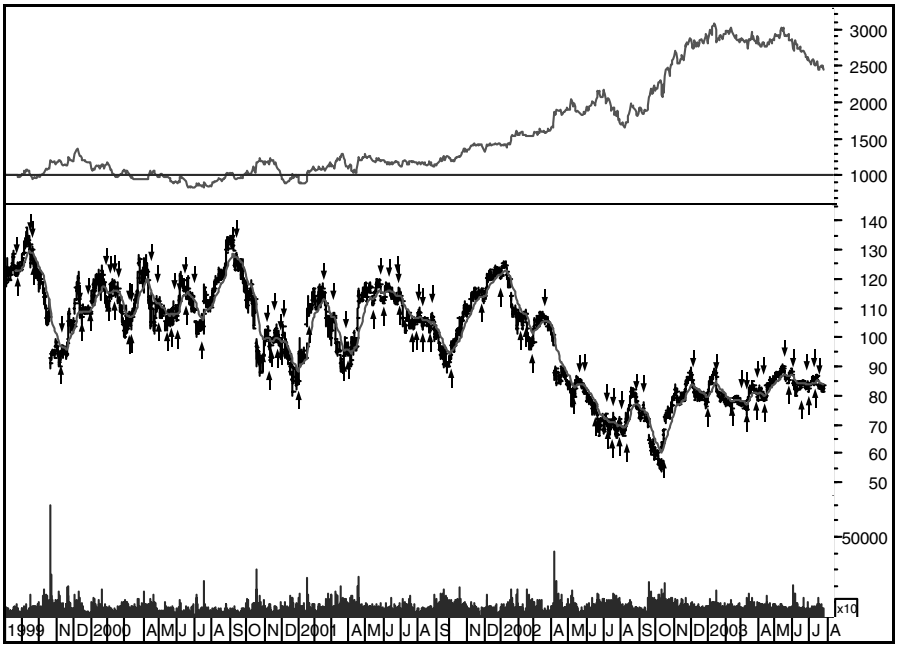

Figure 1-7: Optimization back-test.

The goal of the optimization back-test is to find *x,* which is the number of days in the moving average. Just about every software package allows you to search for *x.* In this instance, the software delivered a result in less than 15 seconds. It was told to try every moving average from 10 days to 30 days over the past 1,000 days. The most profitable moving average would've been 15 days. Figure 1-7 shows the 15-day moving average and the buy/sell signals that the indicator would have generated at every crossover.

In the top window, take a look at the *equity curve,* which shows the cumulative running total of the profit you would have made if you had been buying or selling at each arrow. From a starting point of $1,000 in capital, you now have $2,443, or a gain of 144 percent. Because 1,000 days is about 4 years, that's an annual return of 34.5 percent, better than the return on a risk-free bond and a whole lot better than the loss you would have taken if you had bought $1,000 worth of IBM stock on Day 1 of this test and simply held to Day 1,000. The stock fell 30 percent during the 1,000 days.

Taking a closer look at the test

Go back and look at Figure 1-7 again, and you can see that this case illustrates the general objections to the back-testing process:

- Notice the horizontal line on the equity window at $1,000. Now see that one month into the test, your equity fell below its starting point. The indicator blew up right away; it caused losses. It blew up a few more times, too. In real life, you'd probably not stick with a trading rule that failed to show an interesting amount of profit for almost two full years.
- To apply the 15-day crossover rule would've caused you to trade a total of 119 times, or every 8 days on average. In some cases, you would've been trading every day. The cost of those trades isn't zero.

  Slippage is the term applied to the reduction in trading profits that arises from the cost of trading. It includes the bid-offer spread, commissions, and fees. Always look at the performance track record of an indicator back-test *after* slippage. It can make all the difference between a profitable trading rule and an unprofitable one.

- The majority of trades lose money. You can't see that from the chart, but most back-testing software shows you a *system report* summarizing aspects of the test. In this example, of 119 trades, 82 lost money and only 37 were profitable.

- To get these results, you would've had to sell every time the indicator signaled sell and at the same time go short the stock. In practice, most people can't short equities, although it's an everyday occurrence in the futures market.

  Okay, so tell the software that you're only a buyer when the indicator signals a buy and you never take a short position when the indicator tells you to go short. Because the stock was a net loser over the entire 1,000 days and buy-and-hold would've returned a big loss, you can guess what the outcome is — only a 15 percent return over the 1,000 days, or about 3.6 percent per year. Factor in the cost of commissions, and you would have lost most if not all of your starting capital.

This particular moving average rule didn't work after you factored in realistic factors like paying commissions and not taking a short position. But the case does exemplify one characteristic you seek in a trading rule: The average profitable trade is much higher than the average unprofitable trade, over $75 in this case versus an average unprofitable trade of $26.67. Winners were almost three times the size of losers. This yields a win/loss ratio of 2.8, or $2.80 in profit for every $1 in loss. Moreover, the average winning trade lasted 19 days while the average losing trade lasted only 4 days. Even though the trading rule didn't work, it does meet a second winning characteristic of technical trading that you seek from your indicator: "Let your winners run and cut your losses short."

The goal of every indicator-based trading rule is to get more profit from winning trades than you lose on losing trades. It isn't to have a higher number of profitable trades than losing trades, although that's nice if you can get it.

Fixing the indicator

As the preceding section makes clear, your hypothesis (buying IBM stock every time the price crosses above the *x*-day moving average and selling it every time the price crosses below the *x*-day moving average will consistently and reliably be a profitable trading rule) didn't bear out in the test. But the process illustrates common problems you encounter when you begin back-testing indicators to find the optimum parameter.

Overtrading

An unadjusted indicator often results in overtrading — it generates too many trades overall. *Overtrading* is trading so often that slippage reduces profits or even eliminates them. You therefore need to find adjustments to the indicator to reduce the number of trades, without damaging the returns from the winning trades.

You can *filter* the buy/sell signals by specifying that you want the software to generate a buy or sell signal only if the price is *x* percent above or below the moving average or has been above/below the moving average by *y* amount of time. Be careful not to make conditions too fancy. It's possible to fix the 15-day moving average trading rule with filters to reduce the number of trades so that profitability is high enough even to absorb trading costs. But you may find that filter fixes aren't robust, meaning that they back-test nicely but then fail to deliver the expected gain in real-time. This is because the volatility of the security changes over time.

Keep indicators and their associated trading rules as simple as possible.

Reducing losing trades

Most indicators generate more losing trades than winning ones, and the reason the indicator works is that the winning trades are bigger in money and percentage terms than the losers. But you still want to reduce losers. The single best way to do that is to add a confirmation requirement, such as one of the momentum indicators. In fact, requiring that the moving average indicator be confirmed by a simple momentum rule (see Chapter 5 for more on momentum) reduces the number of losing trades from 82 to 32 and improves profitability considerably. You still have more losing trades than winning trades in absolute numbers, but the average win-loss ratio improves.

Adding judgment calls

In many instances, when you look at the chart itself, you can see where some bar configuration or pattern would've kept you out of a losing trade or gotten you into a winning trade sooner. For example, the price may break a trendline (see Chapter 4) or show a gap (see Chapter 2). But you can't systematically include judgment calls like this in a back-test of a math-based indicator unless you're mathematically very advanced and adept. In most instances, to specify a condition like a gap as qualifying a trading rule would require you to create a very long and elaborate formula.

Applying the indicator again

After successfully back-testing a given indicator, the job isn't quite finished. Back-tests are hypothetical. You don't actually make those trades. To get a more realistic idea of how an indicator-based trading rule works, you back-test the rule on historical price data and then apply it to out-of-sample data. In the IBM case, for example, you'd back-test the rule for the years 1999 to 2003, obtain the 15-day parameter, and then see how it worked in 2004. If the results are about the same on the fresh data, you consider your rule to be *robust,* meaning it works across a wide range of conditions.

As you modify your indicator, be sure to avoid *curve-fitting,* making the indicator perfect for the past. The probability of it being perfect for the future is low, because the market is dynamic and changes. Instead you want to apply the moving average principle in a more flexible way by making it adaptive, by adding confirming factors, by consulting volume, and other means.