CHAPTER 1

Introduction

I have learned a few things over the years and probably retained even fewer. For example, I know that when dealing with the unknown such as the analysis of the stock market, you absolutely cannot speak in absolutes. I also know that random guessing about what to do in the market is a quick path to failure. One needs a process for investing. Any process is better than no process or even worse, a random or constantly changing process. Hopefully, you will find the path to a successful process with this book.

> The noblest pleasure is the joy of understanding.
>
> *Leonardo da Vinci*

How can you even begin to analyze the market if you are not using the correct tools to determine its present state? If you do not fully grasp the present state of the market, your analysis, whether real or anticipated, will be off by an amount equivalent to at least the error of your current analysis. And your error will be compounded based upon the timeframe of your analysis. This highlights why most forecasts are a waste of time.

Believable Misinformation

One should remember things are quite often not what they seem. It is absolutely amazing to me how much people believe that is not true (the voice of experience speaking). Below are some things that many of us learned in our formative years from our teachers and parents. Most we just accepted as fact because we heard it from people we believed.

Myth: Some believe water runs out of a bathtub faster as it gets toward the end.
Fact: Assuming the tub's sides are cylindrical, the pressure is constant, it only appears to drain faster because you observe it starting to swirl toward the end, something you could not observe when the tub was full. The swirling action deceives one into thinking it is draining faster.

Myth: How many think that George Washington cut down a cherry tree?
Fact: George Washington did not cut down a cherry tree. That was a story told so that adults could teach their children that it was bad to tell lies—even our founding father didn't tell lies. Parson Mason Locke Weems, the author who wrote about it shortly after Washington's death, was trying to humanize Washington.
Myth: Did Washington throw a silver dollar across the Potomac River?
Fact: The Potomac River is almost a mile wide at Mount Vernon and silver dollars did not exist at that time.
Myth: Where was the Battle of Bunker Hill fought?
Fact: It was fought at Breed's Hill in Charleston, Massachusetts.
Myth: Dogs sweat through their tongues.
Fact: Guess what? Dogs don't sweat. Their tongues have large salivary glands that keep them wet.

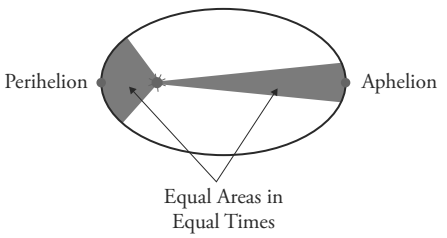
Okay, the following two examples of believable misinformation are only for the hardy who have found this section interesting. The rest should skip them. They are only for nerds like me.

Myth: How many think that December 21 in the northern hemisphere is the shortest day of the year?
Fact: Most do. However, it is actually the longest astronomical day based on Kepler's Second Law of Planetary Motion (planets, in their elliptical orbits, sweep out equal areas in equal time). When the Earth is closest to the sun, the northern hemisphere is tilted away and a much greater arc is swept in a day's travel than when the Earth is the furthest distance from the sun. If the question were posed as to what is the day with the shortest period of daylight, then it would be correct.

See Figure 1.1 for an illustration of Kepler's Second Law of Planetary Motion.

An additional observation on the tilt of the Earth is that summers in the southern hemisphere are generally warmer than the summers in the northern hemisphere. This can be caused by significantly more ocean in the southern hemisphere but also because the southern hemisphere is tilted toward the sun when the sun is closest to the Earth.

FIGURE 1.1 Kepler's Second Law of Planetary Motion



Myth: Bath water drains counterclockwise in the northern hemisphere.

Fact: Another example of how people have believed things that are simply not true is that in the northern hemisphere many will say that water, when draining from a tub, will swirl counterclockwise. Although it very well may do so, it is not for the reason they think it will. This is an example of a little bit of scientific knowledge totally misapplied. The Coriolis Effect (see Figure 1.2) is caused by the earth's rotation and generally applies to large almost frictionless bodies, such as weather systems. This is why in the northern hemisphere, hurricanes rotate counterclockwise, and in the southern hemisphere, they rotate clockwise. The rotational effect is measured in arc seconds (a unit of angular measure equal to 1/60 of an arc minute, or 1/3600 of a degree), which is an extremely small measurement of angular rotation. To apply this principle to the rotation of water draining from a tub is totally incorrect. High pressure and low pressure weather patterns are also reversed—I would love to see a weather reporter from Dallas move to Santiago and adapt to that.

Hopefully, you are getting my point. In the past few years the Internet has been the source and exploitation of much hype and false information. How many times have you received an e-mail from a friend (who probably did not originate it), and believed it to be true but did not bother to check it out, but forwarded it anyhow? You should start verifying them because many of them are a hoax. Believable misinformation flourishes.

FIGURE 1.2 Coriolis Effect

If you enjoy this type of information, I would recommend a new book by Samuel Arbesman, *The Half-Life of Facts: Why Everything We Know Has an Expiration Date*. Arbesman is an expert in scientometrics, which looks at how facts are made and remade in the modern world. People often cling to selected "facts" as a way to justify their beliefs about how things work. Arbesman notes, "We persist in only adding facts to our personal store of knowledge that jibe with what we already know, rather than assimilate new facts irrespective of how they fit into our views." (B4) This is known as confirmation bias, which is dealt with in Chapter 6.

A general theme throughout this book is one of separating fact from fiction. Fiction in this case is often a well-accepted theory on finance, economics, or the market in general. If you were caught believing some of the things mentioned in the previous paragraphs, then how much from the world of investing do you believe? Just maybe you have accepted as fact some things that simply are not true. I certainly know that I did.

In this chapter a lot of basic information is provided to assist you in understanding the remainder of this book. There are definitions, mathematical formulae, explanations of anomalies, historical events that affect the data, differing methods of calculation, and a host of other important information normally found in an appendix. It is of such importance to understand this material that it belongs prior to the discussion and not in the appendix, as is usually the custom.

Indicators and Terminology You Should Be Familiar with

There are basically four different indicator types: differences, ratios, percentage, and cumulative. Differences are most common and should be adjusted for time independent scaling. As the number of issues increase over time, the scaling will get expanded and thresholds that worked in the past will need to be adjusted. One way to do this is to normalize the indicator so the scaling is always between zero and 100. The following section covers many popular indicators and concepts that will help you understand them better when discussed later in the book.

Absolute value. In mathematical script this is denoted with | | around the value in which you want to have its absolute value. Absolute value calculations ignore the sign (positive or negative) of the number. In regard to breadth data, absolute value ignores market direction and only deals with market activity. The absolute value of +3 is 3, and the absolute value of −3 is also 3.

Accumulated/summed $\left(\sum\right)$ (also see cumulative below). This is the term used to add up a series of numbers. For example, the advance decline line is an accumulation of the difference between the advances and the declines. That difference is summed with each new day's difference added to the previous value. Also used with the term cumulate. In many formulae in this book it is shown either as Previous Value + Today's Value or $\sum$.

Alpha. Alpha is a benchmark relative risk adjusted measure. It is not simply excess return. If markets were truly efficient then there would be no alpha.

Arithmetic/simple moving averages. To take an average of just about anything numerical, you add up the numbers and divide by the number of items. For example, if you have $4 + 6 + 2$, the sum is 12, and the average is $12/3 = 4$. A moving average does exactly this but as a new number is added, the oldest number is removed. In the example above, let's say that 8 was the new number, so the sequence would be $6 + 2 + 8$. The first 4 was removed because we are averaging only 3 numbers (3 period moving average). In this case the new average would be $16/3 = 5.33$. So by adding an 8 and removing a 4, we increased the average by 1.33 in this example. For those so inclined: $8 - 4 = 4$, and $4/3 = 1.33$.

In technical analysis the simple or arithmetic average is used extensively. One thing that you should keep in mind is that with the simple average each component is weighted exactly the same. This tends to make the simple average stale if using it for large amounts of data. For example, the popular 200-day average means that the price 200 days ago is carrying the same weight, or having the same effect on the average as the most recent price. It, therefore, is also much slower to change direction. *See* exponential average.

Average true range (ATR). Average true range is the process of measuring the price action over a particular period, usually one day. Normally this is done by just looking at the difference between the high and low price of the day. However, ATR also includes the previous days close so that if there is a gap the price action also has that movement included.

Behavioral finance. A relative newcomer to the analysis of markets, this is the study of why investors do what they do. "Behavioral finance is the study of the influence of psychology on the behavior of financial practitioners and the subsequent effect on markets" Martin Sewell (W6). "I think of behavioral finance as simply 'open-minded finance'" Thaler (A109).

Buy and hold. Buy and hold is the terminology used when discussing the act of making an investment and then just holding it for a very long time. This is more common than most would believe and can be a very bad decision during secular bear periods, which can last on average 17 years.

Capitalization. Capitalization refers to the number of shares a company has outstanding multiplied by the price of the stock. Most market indices, such as the S&P 500, NYSE Composite, and the Nasdaq Composite are capitalization weighted, which means the big companies dominate the movement of the index.

Coefficient of determination. This measures the proportion of variability in a data set that is explained by another variable. Values can range from 0, indicating that zero percent of the variability of the data set is explained by the other variable, to 1, indicating that all of the variability in a data set is explained by

the other variable. It is statistically shown as R^2, which is nothing more than the square of correlation.

Correlation. A statistical measurement showing dependence between two data sets. Known in statistics and finance as R, it is used to determine the degree of correlation, noncorrelation, or inverse correlation between the two data sets (often an issue such as a mutual fund and its benchmark).

Cumulative. Cumulative indicators can be differences, ratios, or percentage. You are adding the daily results to the previous total. The advance decline line is a good example of a cumulative indicator. It is sometimes referred to as accumulate or summed.

Detrend. A term to denote when you subtract the price from a moving average of the price. This will amplify the price relative to its smoothed value (moving average). To visualize this, pretend you had the ability to take both ends of the moving average line and pull it taut so that the price line falls into its same relative position to the now straight moving average line. Doing this allows you to see cycles of a length greater than that of the number of periods used in the moving average.

Divergence. This is when an indicator and price do not confirm each other. At market tops, many times the price will continue to make new highs, while an indicator will reverse and not make a new high. This is a negative divergence. A positive divergence is at market bottoms when the prices continue to make new lows while the indicator does not and makes higher lows.

Drawdown. Drawdown is the percentage that price moves down after making a new all-time high price. Drawdowns of greater than −20 percent are known as bear markets. This book tries to convince you that real risk is drawdown and not volatility as modern finance wants you to believe.

Exponential moving averages. This method of averaging was developed by scientists, such as Pete Haurlan, in an attempt to assist and improve the tracking of missile guidance systems. More weight is given to the most recent data and it is therefore much faster to change direction. It is sometimes represented as a percentage (trend percent) instead of by the more familiar periods. Here is a formula that will help you convert between the two:

$$K = 2/(N + 1) \text{ where } K = \text{the smoothing constant (trend percent)}$$
$$\text{and } N = \text{periods}$$
$$\text{Algebraically solving for } N\text{: } N = (2/K) - 1$$

For example, if you wanted to know the smoothing constant of a 19-period exponential average, you could do the math, K = 2/(19 + 1) = 2/20 = 0.10 (smoothing constant) or 10 percent (trend) as it is many times expressed.

Here is something important in regard to exponential moving averages; by the nature of their formula they will always change direction when they move through the price that is used to calculate them. This means that during an uptrend in prices and their exponential average, when the prices drop

below the average, the average will immediately begin to decline. A simple or arithmetic average will not do this.

Filtered wave. Art Merrill says that it is an amplitude filter to remove the noise by filtering the data. He further states that the important swings in price action are clearly evident. Simply, a filtered wave is a process of removing a predetermined percentage of noise.

Momentum. See Rate of Change.

Normalize. This is a mathematical procedure to reduce the scaling of unlike data so it can be more easily compared. To normalize a series of data one usually wants the resultant data to fall in a range from zero to 100. The easiest way to do this is by the following formula:

$$\frac{\text{Current Value} - \text{Lowest Value in the Series}}{\text{Highest Value in the Series} - \text{Lowest Value in the Series}} \times 100$$

Some of you might notice that this is similar to the formula for the %K Stochastic indicator, with the exception that for stochastics, the highest and lowest values are set by the number of periods you want to use. Many indicators are served well by looking at their normalized values for a predetermined number of periods. For example, if there was a good identifiable cycle in the market being analyzed, the number of periods of that cycle length might be a good number to use for normalization. A number of the indicators in this book are normalized in that manner.

Oscillator. A term used to explain a number of technical indicators such as rate of change, momentum, stochastics, RSI, and so on. These are all indicators that oscillate above and below a common value, many times which is zero. Other times they oscillate between zero and 100.

Overbought/oversold. These terms have got to be the most overused and misunderstood terms when talking about the markets. Overbought refers to the time in which the prices have risen to a level that seems as if they cannot go any higher. Oversold is the opposite—prices have dropped to a point it seems as they cannot go any lower. Although this sounds simple enough, the term is usually based on someone's personal observation of price levels and not on sound analysis.

Overlay. This refers to the act of putting an indicator on top of another one. A simple example would be displaying a moving average of an indicator on the same plot. In this case the indicator and its moving average would utilize the same scaling. Many times an unrelated indicator can be overlaid on another using totally independent price scaling.

Peak. Peak is terminology referring to a peak in prices, usually easy to identify if looking at a price chart, but does depend upon the time frame you are working with. *See* Trough.

Percentage. Percentage is generally better than a ratio because you are making the item relative to its related base. For example, the number of new highs by itself can be meaningful in the short term, but over long periods of time and

with more and more issues traded, the relationship cannot remain consistent. If you took the number of new highs as a percentage of the total issues traded, then the scaling will always be from zero to 100 and large amounts of data can be viewed with some consistency.

Rate of change. Used interchangeably with momentum, rate of change is looking at a piece of data relative to a like piece of data at an earlier time. For example, with stock data, a 10-day rate of change would take today's price and subtract or divide by the stock's price 10 days ago. If one takes the difference in price and then divides by the older price you will see percentage changes. Generally, it is not the value of the rate of change that is important, but the direction and pattern associated with it. However, some oscillators have consistent levels that can be used as overbought and oversold. Rate of change seems to more often than not be in reference to the difference in values, whereas momentum is more often the ratio of values. The line shape will be the same, only the numbers that make up the line will be different.

Ratio. A ratio is when you divide one data component by another. This keeps them in perspective and will alleviate many of the problems associated with using just the difference. Sometimes the numerator and denominator are not balanced and you get a nonsymmetrical problem similar to what you get with the Arms Index. This is really not a problem as long as you are aware that it exists. Finally, a ratio of positive numbers (or similar signs) is always going to be greater than zero.

Real. Commonly used when referring to data that has been adjusted for the effects of inflation. Most raw data contains the effects of inflation, so by removing inflation from the data, it is called real, such as the real S&P 500. Real = Nominal – Inflation.

Regression. This provides us with an equation describing the nature of the relationship between two variables, plus supplies variance measures that allow us to access the accuracy with which the regression equation can predict values on the criterion variable, making it more than just curve-fitting. In modern finance it is used extensively to generate alpha and beta when comparing two issues.

Semi-log. Semi-log refers to the price scaling on charts. The abscissa axis is normally the date axis so it cannot be displayed logarithmically. Logarithmic scaling shows percentage moves in price and is much better for viewing long-term data. Note: You cannot use semi-log scaling with any values of zero or negative numbers.

Smoothing. This is in reference to averaging data either by a simple or exponential moving average. It is a better adverb to use than always trying to explain that you take the moving average of it or take the exponential moving average of it; just say you are "smoothing" it. It is also used as a verb as in you can "smooth" it.

Stop loss. Also known as a protective stop. This is a process in which an investor protects herself against losses larger than desired. There are many types of stop

losses, such as a percentage drop from the buying price or a percentage drop from the current or highest price reached.

Support and resistance. First the definitions of support and resistance, then an explanation as to what they are. More elaborate definitions are available in almost any text on technical analysis. In fact, one of the best discussions of it is in Steven Achelis' book, *Technical Analysis from A to Z*, where he ties it to supply and demand. Support is the price at which an issue has trouble dropping below. Resistance is the price level that it has trouble rising above.

Trendiness. This is my term for a market or any price series to maintain a trend. Of course, the trend must be defined by not only its magnitude but also its duration. Chapter deals with trending markets and this term is used considerably in that chapter.

Trough. Trough is terminology referring to a low point in prices, usually easy to identify if looking at a price chart, but does depend upon the time frame you are working with. *See* Peak.

Volatility. Volatility is a measure of the movement of a time series, usually of price data, however, not restricted to that. There are many forms of volatility and there is an entire section in this book that discusses it.

World of finance. This is a term I use to include financial academia and retail (sell side) Wall Street. There is much in this book that is critical of the world of finance.

There are other terms throughout the book and when I think they need to be defined, the definition is presented on the first appearance of the term.

Living in the Noise

I'm constantly amazed at the media's attempt to justify every move in the market with something in the news, whether it be economical, political, monetary, or whatever. If the market is up over the past hour, they find a positive news item to justify it. If the market is down, then a negative news item is used. There are other ongoing and constant drumbeats of useless information droning throughout the day while the market is open. Some are just plain wrong, such as "the market is down today because there are more sellers than buyers." It is a free trading market; so for that to work; there has to be the same number of buyers and sellers, no matter what the market is doing. They would be correct if they said that the market sold off today because there was more selling enthusiasm. And finally there is the endless supply of questions for the experts.

Here are some other examples of noise:

"Stocks are under pressure"—Why?
"More sellers than buyers"—Impossible on a share basis.
"What is causing this decline today?"—Always seeking a reason—rarely correct.
"How do you think the market will end this year?"—Forecasting is a fool's game.

"The earnings beat expectations and the stock is down two points"—Sad.
"Cash on the sidelines"—How can that be, when you sell a stock someone has to buy it.
"The latest survey says . . ."—Who cares?
"Breaking news"—It wouldn't be news if it wasn't breaking.
"Countdown clocks"—Media fascination with investors' fear.
"Fair value on morning futures"—Waste of time.
"Sorry Pope Benedict, we have to cut you off because earnings reports are coming out"—Pathetic.
"Asking a long time buy and hold manager what he thinks of the market"—Hmmm, let me guess.
"Brokerage firms offering magical technical analysis software to open an account"—It's the farmer, not the plow.

Data

I used a great deal of stock market data in this book, primarily the daily series for the Dow Jones Industrial Average and the S&P 500. Reliable data is very important for proper analysis. I have seen references to stock market data back to the early 1800s, but it was spliced together from numerous sources, usually by academics who I think just don't have the same appreciation for accuracy as I do. The two series I used most often have been in existence with original source since the start date of the data I used. Below is some information about that data used in this book.

S&P 500. My series began December 30, 1927. From the beginning until March 3, 1957, it was the S&P 90. There is, however, older data produced by the Cowles Commission back to 1871.
Dow Industrials. My series began February 17, 1885, but records show that Charles Henry Dow began the series on July 3, 1884. While Charles Dow began publishing his series in 1897, he maintained the data from 1885. Following the introduction of the 12-stock industrial average in the spring of 1896, Dow, in the autumn of that year, dropped the last nonrailroad stocks in his original index, making it the 20-stock railroad average. Initially the data was known only as the Dow Jones Average. In 1916, the industrial average expanded to 20 stocks; the number was raised again, in 1928, to 30, where it remains today.

Shiller PE and CPI data were obtained from Robert Shiller's website at: www.econ.yale.edu/~shiller/data.htm.

This is monthly data back to 1871 and is updated periodically.

Keeping the data updated is also an important part of analysis; the data sources must be reputable. I use Bloomberg, Thomson Reuters, and Pinnacle Data, and would comfortably recommend them to anyone.

This book is not and never was designed to be a storybook to be read from beginning to end, but is a compilation of information about the markets, the flaws of modern finance, uncovering market history, misconceptions used to promote or market a flawed strategy, and a host of other tidbits. It takes almost two-thirds of the book to get to the "meat" of the book: rules-based trend following models.

Furthermore, I think a money manager, whether managing funds or separate accounts who follows a benchmark or particular style is never asked "why" they manage money that way. Simply, if you are trying to at least track or outperform a benchmark, no one will ask why you try it that way. This is where a rules-based trend following model, which it almost totally unconstrained in what to invest in and especially treats cash as an asset class is completely different. Much of this book is about why I use a rules-based trend following process.

Modern financial theory wants you to believe that the markets do not trend, are efficient, and therefore cannot be exploited for profit. They state that it is random and is normally distributed except for some very long-term periods that last many decades. What they ignore is that the market is made up of people, frail humans who act and invest like humans. Humans can be rational and they can be irrational, rarely knowing which is present and when. Being rational at times and being irrational at times is normal. This is not random behavior and is quite predictable. Hopefully this book demonstrates those failings and offers a solution.

Another focus in this book is the subject of risk. There is a great story about the simplicity of risk analysis told by the late great Peter Bernstein in his book, *Against the Gods*. Blaise Pascal, in scribblings in the margin of his *Pensees* publication, puts for what is now known as *Pascal's Wager*. He asks, "God is, or he is not. Which way should we incline? Reason cannot answer." He explained that belief in God is not a decision. You cannot awake one morning and declare, "Today I think I will decide to believe in God." You believe or you do not believe. Pascal leads us through a decision path that ultimately says that if there is not a God, then it doesn't matter. However, if there is a God, then the decision on how to live your life is important. Salvation is clearly preferable to eternal damnation, the correct decision is to act on the basis that God is. (B7)

I have sprinkled many quotes throughout this book. I like quotes because if something someone has said lasts over the years or is repeated often, it is probably profound. This is not unlike trite expressions, which I believe exist because they are generally true whether you want to believe them or not.

I give a lot of presentations/speeches and each time I learn something. One thing I learned a few years ago is that if you want to present some serious information to an audience that might just not understand your concepts or that resists anything that is new, use humor sparingly. The humor needs to be simple and essentially just witty, but not overly so. You must get them to uncross their arms and smile; this seems to improve their hearing. I have buried a little of that in this book—I think.

Throughout this book, in fact throughout most of my life, I have had a tendency to explain things using multiple approaches in the hope to cover a broader audience.

In fact, you soon learn that I can beat a horse to death at times. If you grasp a concept I am explaining early, please accept my apologies for the remaining explanations.

Finally, here is a short comment about observable information versus actionable information. Often the world of finance will produce very convincing data or charts that show historical information about the markets. The problem is that they are trying to convince you that you should invest a certain way based on that data they have shown. Usually, and more often than not, the data is just showing you about past market history and is really only observable information because you cannot turn that knowledge into an investment strategy or idea. Actionable information, on the other hand, is data or charts that show realistic information that is convertible into a valid investment strategy. Do not misunderstand this, observable information is about studying the past and learning about the markets, which is invaluable, however it takes actionable information to make investment decisions.

NOTE

Select tables and figures in this book are available online at www.wiley.com/go/morrisinvesting. While they are the same data, the formatting makes them much easier to view and use. Plus they will be updated periodically with more current data. See "About the Online Resources" at the back of the book for more information.