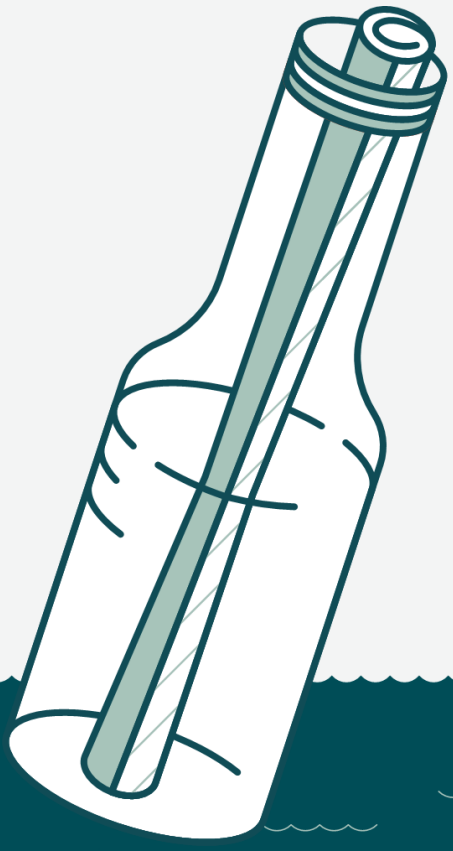
CMT ASSOCIATION

CMT LEVEL I CURRICULUM

2024 CHARTERED MARKET TECHNICIAN EXAM

AN INTRODUCTION TO
TECHNICAL ANALYSIS



UWorld | FINANCE

CMT Level I

CMT Level I

An Introduction to Technical Analysis

Readings Selected by

The CMT Association

UWorld
YOUR WORLD OF LEARNING

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The CMT Association

What We Do

The CMT Association, founded in the 1960s, is a not-for-profit professional association dedicated to advancing the discipline of technical analysis and the work of technical analysts worldwide. The Association pursues this mission through credentialing, ethics, education, and advocacy.

- Credentialing: The CMT Charter is the globally respected credential granted to Association members in good standing who complete the examination process. Charterholders have demonstrated mastery of a core body of knowledge in both the history and current practice of technical analysis. Their ongoing membership in the CMT Association is evidence of their commitment to the professional and ethical practice of the craft.
- Ethics: The CMT Association and its members are committed to maintaining the highest ethical standards in all their professional activities. The Association has adopted the CFA Institute Code of Ethics and Standards of Professional Conduct for its membership. In fact, questions on ethics appear on all three levels of the CMT exams. Furthermore, members risk disciplinary sanctions by the CMT Association including revocation of membership and the right to use the CMT designation for violating the Code and Standards.
- Education: The Association's dedication to education extends beyond the curriculum it maintains for candidates in the CMT Program. Through webcasts, local chapter meetings, and an Annual Symposium, the Association promotes ongoing learning and intellectual synergies among all those interested in technical analysis.
- Advocacy: The Association represents the technical analysis community to the public, to academia, and to regulatory bodies worldwide. This work is intended

to secure the place of technical analysis as a recognized discipline alongside other modes of financial market analysis, and to make the public aware of its strengths and limitations.

Who We Are

The membership of the CMT Association includes technical analysts, portfolio managers, investment advisors, market-letter writers, journalists, and academics. With CMT charterholders in more than 50 countries, members are involved in global markets from currencies to commodities, equities to ETPs, and futures to fixed income.

The membership honors the long history of technical analysis of financial markets while generating new methods that incorporate the latest concepts in behavioral finance, quantitative analysis, and algorithmic applications.

Governance and Operation

The CMT Association is overseen by a Board of Directors elected from and by the membership. Additional work on behalf of the Board and the membership is carried out by committees composed of members who volunteer their time and expertise. Dozens of local chapters, found in many countries, offer opportunities to hear from renowned technicians and network with others who share a passion for technical analysis. New members as well as veterans are encouraged to become involved in chapters and on committees.

The staff of the Association, headquartered in New York, supports the Board and the membership in carrying out the mission of the Association. Members should feel free to contact staff for information related to the activities and workings of the CMT Association, volunteer opportunities, and the credentialing program.

■ The CMT Program

Purpose

The CMT Association initiated a professional credentialing program in technical analysis in the 1980s. This program is an essential part of the Association's work in advancing the practice of technical analysis and maintaining the highest possible professional standards for practitioners. By designing the curriculum and setting standards for examinations, ethics, and professional experience, the Association assures that candidates satisfy the stated requirements to be awarded the CMT Charter.

The CMT Program is overseen by the Curriculum and Test Committee of the CMT Association. The Committee is composed of volunteer charterholders who are distinguished by their dedication to technical analysis and their willingness to contribute to its advancement. The Committee approves the curriculum and monitors the exam content and administration.

Curriculum

The CMT Program curriculum is published in three volumes—one for each level of the exam series. The readings are drawn primarily from published texts written by recognized experts with additional content commissioned by the CMT Association.

The three levels of the curriculum are described as follows:

- Level I: Introduction to Technical Analysis: Basic knowledge of the terminology and analytical tools used in technical analysis.
- Level II: Theory and Analysis: Application of concepts, theory, and techniques.
- Level III: Integration of Technical Analysis: Integration of concepts with practical application.

The specific topics covered in each level of the curriculum have been determined by a job-analysis survey of technical analysis practitioners. The information from the survey, updated periodically, is used to create a list of knowledge domains, subdomains, and weightings for each level of the curriculum and exam. In addition, each of the three exams includes "ethics" as a knowledge domain.

Exams

All three levels of the CMT Association exams are administered during semiannual test windows in June and December. The exact dates for each test window are announced well ahead of time. Candidates complete the exams on computer terminals at Prometric Test Centers located worldwide or remotely, in a suitable location, using Prometric's ProProctor service. Candidates may sit for only one exam during each test window. Furthermore, candidates should be aware that the CMT Association exams are offered only in English, regardless of the candidate's location or the location of the test center.

CMT Exams

Level	Format	Duration	Content
I	Multiple choice	2 hours	132 questions: 120 scored, 12 trial
II	Multiple choice	4 hours	170 questions: 150 scored, 20 trial
III	Multiple choice and short answer	4 hours	Approximately 50, but varies at each administration

Receiving the CMT Charter

To be awarded the CMT charter, candidates must:

- Successfully complete all three exams. (CFA charterholders may request a waiver from Level I of the CMT exams.)
- Attain professional membership in the CMT Association, which requires:
  - Sponsorship by three members in good standing, and
  - Satisfying the stipulation for professional experience.

- Remain current on dues.
- Complete and maintain an accurate Personal Conduct Statement.

The Level I Textbook

As noted above, the CMT Level I exam is a 2-hour multiple-choice exam focused on basic knowledge of the terminology and analytical tools used in technical analysis. The knowledge domains listed in the table below, and their weightings, are covered in the Level I text and reflected on the exam. Although this may be a useful checklist for some readers, candidates may be best served by focusing on the Learning Objective Statements that appear at the start of each chapter. These are described in another section below.

Level I: Knowledge Domains and Weightings

Domain	Weight
Theory and History	9%
Markets	5%
Market Indicators	7%
Construction	5%
Trend Analysis	16%
Chart and Pattern Analysis	23%
Confirmation	3%
Cycles	5%
Selection and Decision	13%
System Testing	5%
Statistical Analysis	6%
Ethics	3%

The number of questions on the exam drawn from each knowledge domain approximates the percentages in the table above.

Ethics

The CMT Association has adopted the CFA Institute Code of Ethics and Standards of Professional Conduct ("Code and Standards") as its ethics guide. All three levels of the CMT exams include questions pertaining to ethics. All references to "CFA Institute," "members," "candidates," "CFA Program," and so on in the Code and Standards should be read to apply to CMT Association and its members, candidates, programs, and so on.

When preparing for the CMT exams, candidates are encouraged to review the Standards of Practice Handbook ("Handbook"). According to the CFA Institute,

"The Standards of Practice Handbook grounds the concepts covered in the Code and Standards for practical use. You can use this handbook for guidance on how to navigate ethical dilemmas you might face in your daily professional life." Reviewing the Handbook provides a more comprehensive study process and preparation for professional practice.

Study material regarding ethics is not in this text. Both the Code and Standards and the Handbook are available for download from the CMT Association website: https://cmtassociation.org/association/cmt-code-of-ethics/.

Learning Objective Statements

A list of Learning Objectives appears at the beginning of each chapter. These are intended as a guide to the most important concepts discussed in the chapter. An effective study method is to read the Learning Objectives as an introduction to a chapter before beginning study of the chapter. After completing the chapter, review the Learning Objectives again and write a few sentences that demonstrate competence on that topic.

Candidates should also be aware that the specific points mentioned in the Learning Objectives are prime material for the exams, but there may also be questions drawn from any part of the text.

THE ORIGINS OF THE TERM "TECHNICAL ANALYSIS"

By George A. Schade, Jr., CMT

> The technical position of the market may warrant a continued reaction, but actual business conditions do not warrant lower prices.[1] *New-York Daily Tribune*, June 21, 1897.

A discussion among technical analysis professionals prompted the query, "Where did the term 'technical analysis' originate?" This commentary aims to trace the roots of the name of our craft.

In 1922, William Peter Hamilton, editor of the *Wall Street Journal*, had his influential Dow Theory book *The Stock Market Barometer* published.[2] In downplaying the importance of stock manipulators, he cited Edwin Lefèvre's description of a manipulator featured in Lefevre's fictional story *The Break in Turpentine,* published in April 1901:

> The art [of manipulation] is most difficult, for stocks should be manipulated in such wise that they will not look manipulated. … It requires boldness and consummate judgment, *knowledge of technical stock-market conditions*, infinite ingenuity and mental agility, … (emphasis added).[3]

The reference to technical stock market conditions shows that the term "technical" was associated with stock market commentary as early as the dawn of the 20th century.

■ I. The Dictionaries

Our starting point is the definition of "technical." In 1828, lexicographer Noah Webster published his two-volume *An American Dictionary of its English Language*. He worked on it from 1807 until 1824–25. The dictionary stated that the terms

"Technic, Technical" were Greek derivations "from art, artifice … to fabricate, make or prepare,"

> Pertaining to art or the arts. A *technical* word is a word that belongs properly or exclusively to an art; as the verb to *smelt*, belongs to metallurgy. So we say, *technical* phrases, *technical* language. Every artificer has his *technical* terms.[4]

The dictionary stated that the term "analysis" was of Greek derivation, "a loosing, or resolving … to loosen,"

1. The separation of a compound body into its constituent parts; a resolving; as, an *analysis* of water, air or oil, to discover its elements.
2. A consideration of any thing in its separate parts; an examination of the different parts of a subject, each separately; as the words which compose a sentence, the notes of a tune, or the simple propositions which enter into an argument. It is opposed to *synthesis*.[5]

An 1865 revised edition of Webster's 1828 dictionary defined "technical," in relevant part as follows:

> Specifically appropriate to any art, science, or business; as, the words of an indictment must be *technical*. *Blackstone* .... .[6]

The 1865 edition defined "analysis" as:

> A resolution of any thing, whether an object of the senses or of the intellect, into its constituent or original elements; an examination of the component parts of a subject, each separately, as the words which compose a sentence, the tones of a tune, or the simple propositions which enter into an argument. It is opposed to *synthesis*.

Up through 1916, dictionaries derived from Webster's lexicography retained the same definition of "technical." The term pertains "to the mechanical arts: relating to art, science, or to a particular profession."[7]

The most frequently used legal dictionary in the United States, Black's Law Dictionary, was first published in 1891. The 1910 edition defined the term "technical" as, "Belonging or peculiar to an art or profession. Technical terms are frequently called in the books 'words of art.'"[8]

These influential early dictionaries show that "technical" was a term applicable to an art, science, business, or profession and "analysis" involved the separation and examination of the components or elements of a matter being studied.

By the mid-1890s, the term "technical" took on a unique meaning when it came to the stock market. The term was associated with a description of the condition or position of the stock market, particularly, to refer to an oversold or overbought market.

Although he did not use the term "technical," Charles H. Dow editorialized in July 1902, "The outsider who will wisely study values and market conditions and then exercise patience enough for six men will be likely to make money in stocks."[9] In his March 7, 1902 editorial, he wrote, "Intelligent trading begins with study of conditions, and a justified opinion that the general situation is either growing better or worse."

In 1903, *Smith's Financial Dictionary* was published. Smith did not define "analysis" or "technical analysis" but defined "technical conditions or a technical market" as follows:

> Technical conditions exist in a stock when the price is raised by manipulation—by force of buying orders given and executed for the purpose; or such conditions exist when the price is lowered by manipulation—by force of selling orders given and executed for the purpose. Also, technical conditions exist in a stock when the price rises in consequence of enforced covering of short contracts (enforced buying by speculators who had sold stock which they did not possess) or such conditions exist when the price falls in consequence of enforced selling of long stock (stock which had been purchased with the intention of selling at an advanced figure.)
>
> A technical market exists when prices as a whole are raised or lowered, as the case may be, by manipulation; also a technical market exists when an oversold condition compels covering of short contracts with a consequent rise in prices or when an overbought condition compels liquidation or sale of long stocks with a consequent fall in prices.[10]

Another financial dictionary, published in 1906, did not define "analysis," but defined "technical conditions" in relevant part as follows:

> When prices in a stock market as a whole are advanced or depressed by manipulation. The technical conditions in an oversold market cause an advance which forces short covering, and the technical condition in an overbought market result[s] in liquidation of long stock in consequence of a fall in prices.[11]

In 1918, the Investment Bankers Association of America and the Association of Stock Exchange Firms published a study course of the "stock exchange business." The course defined the "technical condition of the market" in relevant part as follows:

> Reference is constantly made in the press to the "over-bought" or "over-sold" condition of the market. By these terms it is meant that there has been, in view of the normal supply and demand of a given security, an unusually large amount of buying on margin or an unusually large amount of short selling. If this over-bought or over-sold condition is discovered, the opposing interest in the market may seek to compel a decline, or to compel the short interest to cover.[12]

Sereno S. Pratt was a career journalist from 1882 until he became editor of the *Wall Street Journal* in 1905. Hailed as one of the brightest financial writers among New York City's journalists, he wrote a comprehensive book that described the stock market and its trading practices. The following definition of "technical position" appeared in the 1912 edition:

> [T]he stock speculator must study the stock-market itself so as to inform himself as fully as he can as to its condition: whether there is an oversupply of stocks on hand ready to be sold, or a big short interest; what certain influential "interests" or heavy operators are doing; whether the supply of money for speculative purpose is, or is not, to be ample; in other words the whole technical position of the market.[13]

The word "technical" became part of Wall Street's language to describe the condition of the stock market as overbought or oversold. Initially, these conditions were attributed to stock manipulation raising the question whether the term "technical" was used to describe an artificial condition due to manipulation.

■ II. The Newspapers

By 1897, the term "technical" was being used in newspaper columns reporting on the stock market. Newspapers formalized the use of the term to describe daily stock trading activities. Their reports strongly influenced the acceptance of the term "technical" into the vernacular of Wall Street.

Following are some of the earliest references found in New York City newspapers of general circulation:[14]

> June 21, 1897—"The technical position of the market may warrant a continued reaction, but actual business conditions do not warrant lower prices." *New-York Daily Tribune*.
>
> November 5, 1897—"Outside buying on a small scale was noticed on all declines, but it was not effective in preventing substantial net losses, although it strengthened the technical position of the market." *New-York Daily Tribune*.
>
> November 8, 1897—"The market will soon be oversold—just as it was overbought last summer—and when that condition appears advances will be made, despite any adverse factors which may then exist. The weakness last week materially strengthened the market. Its technical position was improved by the passing of stocks from weak to strong hands and by the creation of a large short interest." *New-York Daily Tribune*.
>
> December 4, 1899—"The greater part of the supply of stock available for speculative purposes is strongly held, and there is no disposition

among such holders to sell at ruling prices. Back of the strong technical position is the business situation, which is constantly adding increased value to the intrinsic worth of securities." *New-York Daily Tribune*.

December 31, 1899—"Prosperity has placed a healthful check upon rash speculative ventures, and the new year therefore opens with the speculative situation clear of weak material, with the banks and stock market in a strong technical position backed by active and sound business conditions." *New-York Daily Tribune*.

January 14, 1900—"The technical position of the market is strong, and in the current week the force of this strength ought to be felt by the operators who are short of stocks." *New-York Daily Tribune*.

July 7, 1900—"Traders are, for the time, bullish but they will begin to bear stocks again just as soon as technical conditions place stocks in a position where they may be successfully attacked." *New-York Daily Tribune*.

May 4, 1901—"They represent the operations of oversanguine traders who can see but one side of affairs—who overlook the always potent 'technical position' and who imagine that a rise can be unbrokenly continuous." *NewYork Times*.

July 27, 1902—"Technical conditions moneywise have been and are favorable.... An important phase of the technical situation is the paucity of holdings 'on margin.'" *NewYork Times*.

May 5, 1905—"Nor could cause for the fall in prices be ascertained from any analysis of the technical speculative position in Wall Street at the present time." *The Sun*.

August 10, 1917—"A technical analysis of the decline on Wednesday in the final hour shows that it was a mere bear raid and was not backed up by any genuine liquidation." *The Sun*.

May 10, 1918—"With no more news than has been known for some time past to explain the sharp advance of security prices yesterday traders turned to the technical conditions within the market itself for enlightenment. ... And yet an analysis of the market's technical situation, referring mainly to money and the short interest, do not greatly illuminate the onlooker." *The Sun*.

■ III. Charles H. Dow's Editorials

Charles H. Dow's principles set forth in his *Wall Street Journal* editorials were seminal contributions to the discipline of technical analysis. He wrote eight editorials, out of some 255, entitled *The Position of the Market*. These editorials were written between March 19, 1901 and April 22, 1902. He wrote his last editorial that April. Although the eight editorials did not use the terms "technical" or "technical analysis," as noted above, Dow knew the importance of assessing market conditions.

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IV. Technological Advancements

The period from 1870 to 1914 is called the Second Industrial Revolution or the Technological Revolution because of the transformative inventions of the time. Four inventions brought accuracy with speed to financial markets: the telegraph, cable, the telephone, and the "stock indicator" later called the ticker. Stock quotations and market information sped worldwide. Even the nascent Dow Jones & Company News Service was distributed via telegraph.

In 1866, a reliable telegraph cable line crossed the Atlantic from the United States to Europe connecting the two largest financial markets in the world, London and New York. Cable expanded the reach of Wall Street's institutions which began to underwrite foreign bonds and trade securities worldwide.

By 1912, there were 408,769 telephones in NewYork City; it was estimated that "there are probably a greater number in the Wall Street district than in any other equal territory in the world."[16] About 500 members of the NewYork Stock Exchange (NYSE) had private connections to the exchange's trading floor.

In 1867, telegrapher Edward A. Callahan introduced the stock ticker. The ticker printed quotations on a narrow ribbon of paper that became known as the "tape." In 1905, some 23,000 offices in the United States subscribed to ticker services. By 1912, the NYSE was using 1,150 tickers to supply quotations to its 1,100 members in 583 firms.[17] "No better proof is needed of the universality of speculation."[18]

The introduction of the ticker "revolutionized market communications by making it possible to quickly transmit market information across the United States, significantly narrowing the gap between Wall Street and Main Street. When telephones were installed at the NYSE in 1878, the market became even more efficient, and on December 15, 1886, trading volume topped 1 million shares for the first time."[19]

These tools resulted in faster distribution of accurate market data and increased securities trading. Technical studies had a bright future.

■ V. The Growth of Stock Trading in the United States

In 1818, the newly formed New York Stock and Exchange Board listed less than fifty different issues. In 1839, it listed 144 stocks. The "number and variety of securities traded at the NYSE steadily increased as America grew. States and municipalities issued bonds to finance the construction of turnpikes, canals, and bridges. Banks, insurance companies and railroads issued stock to raise the necessary capital to develop and expand. By the end of the Civil War, more than 300 different stocks and bonds were traded at the NYSE."[20] In 1869, the NYSE had 1,060 members.

The listings of stocks and bonds grew through the 1880s as the economy expanded. Between 1875 and 1885, the number of shares traded on the NYSE doubled. In 1882, over 116 million shares traded.

Increased trading produced large quantities of information which, in turn, stimulated a desire for a new form of investment analysis.

NYSE Trading Floor, 1903.[21]

■ VI. Creation of the Dow Jones Industrial and Railroad Averages

On July 3, 1884, Charles H. Dow published his first stock price average when he was working for the *Customer's Afternoon Letter*, a financial news bulletin. The average consisted of the closing prices of 11 companies, of which 9 were railroads. It was the forerunner of the Dow Jones Railroad Average.

From 1884 to 1896, Dow made changes to the index, mostly switching from railroad to industrial stocks. On May 26, 1896, he introduced the price-weighted Dow Jones Industrial Average, consisting of twelve industrial stocks. In 1916, the average was expanded to 16 stocks, and in 1928, to 30. The average was proof that industrial stocks were overtaking the railroads as the leading stocks in the NYSE.

On October 7, 1896, Dow introduced the Railroad Average. He replaced the two non-rail stocks in his list of 20 "active stocks" with rail stocks, and the Dow Jones Railroad Average was created. In 1970, its name was changed to the Dow Jones Transportation Average.

Charts of the averages showed price trends and facilitated analysis of market conditions. These averages, as well as the numerous other indexes that came after, added an important dimension to the analysis of price, volume, and performance, the core of technical analysis.

■ VII. The Twenties

The concept of the technical condition or position of the stock market as being overbought or oversold remained into the 1920s, a significant formative period for technical analysis. Professors Solomon S. Huebner and Charles A. Dice each wrote influential books about the stock market, both entitled *The Stock Market*. They defined "technical position of the market" as describing an overbought or oversold market.[22] Dice wrote a chapter entitled *The Technical Position of the Market*.

By the late 1920s, the term "technical analysis" was used frequently. Richard W. Schabacker wrote about the two kinds of analysis, fundamental and technical. The "technical considerations are those arising out of the stock market itself."[23] He wrote about the "technical approach," "technical theory," "technical science," and "technical action." His 1932 investment course was entitled *Technical Analysis and Market Profits: A Course in Forecasting*.[24]

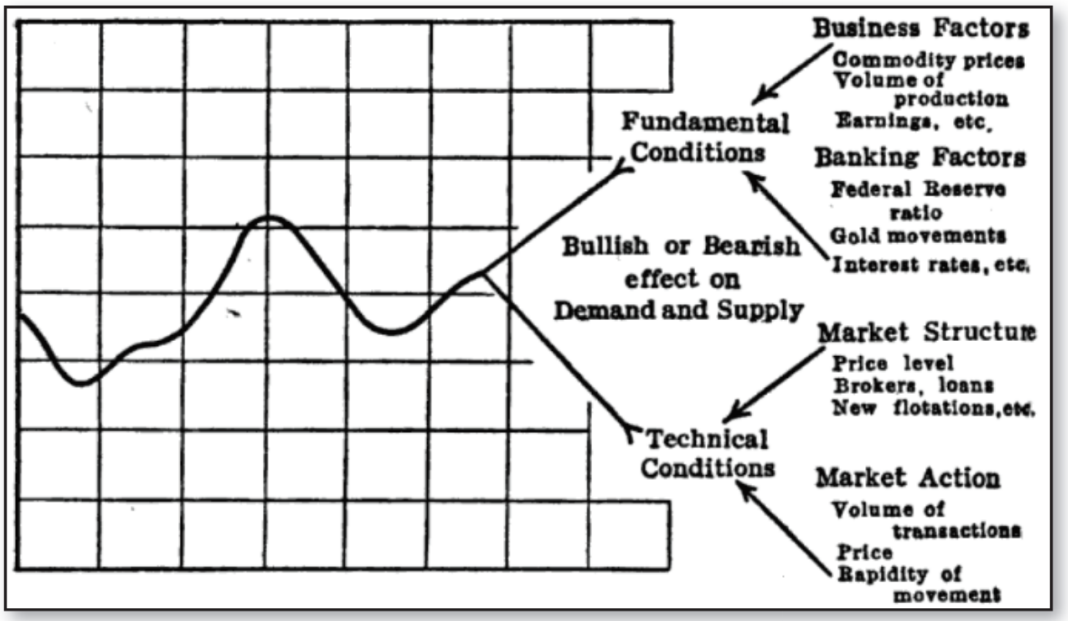
The elements of the discipline were being set. In 1931, Joseph H. Kerr, Jr. described the principal "factors of deduction," which when combined with technical conditions, could forecast the action of the market: Price, Volume, News, Price Position, and Time.[25] Analyst Harold M. Gartley shortened the list to price, volume, and time.[26]

Twelve years earlier, a statistician wrote with great concision:

> When demand and supply are fairly even, the market moves in a rut. How secure a clear-cut idea of demand and supply? By constructing a graph which shows:

1. Price. This measures the *extent* of the move.
2. Time. This shows *rapidity* of action.
3. Volume. This indicates *bulk*, or the amount of turnover. (emphasis in original)"[27]

This statistician drew the following graph:



Making the Market Price

By 1930, the study of stock market trends, prices, volume, and performance had received a great amount of attention. The foundations of technical analysis had been built.

■ Conclusion

The lexicography of the term "technical" relates it to an art, science, business, or profession. The term "analysis" refers to the separation of a whole into its constituent elements so they can be studied. The stock market can be overbought or oversold. In the late 1890s, the term "technical" was used to describe this condition.

As stock trading increased at the advent of the 20th century, aided by inventions that brought accuracy and speed to the process, significant amounts of information were collected and distributed. Price, volume, performance, highs, and lows were immediately available. This information was analyzed in order to uncover values. Technical analysis became both a discipline and a profession.

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SECTION I

Theory and History of Technical Analysis

My life seemed to be a series of events and accidents. Yet when I look back, I see a pattern.

—Benoît B. Mandelbrot

Centuries of work in interpreting and understanding the movement of prices in financial markets brings us to today's technical analysis. Marks on paper and calculations by hand, pit traders and runners, have all given way to the speed and efficiency of computers and electronic information networks. Yet the goals remain the same: identify the trend as early as possible, capitalize on it for as long as possible, and manage the risks along the way.

It is traditional to examine price, volume, and indicator information in charts. To this day, understanding how and why charts are constructed as they are is critical not only to classical technical work—the need for a person to absorb and interpret large amounts of data—but also to the most modern applications of quantitative technical analysis.

This section introduces the core concept of "trend" and its components as used in technical analysis. This includes information on the fractal nature of price action, an important principle in the application of technical analysis across time horizons.

Charting—data visualization as practiced by technicians since before it became known as such—is introduced here with additional chart variations covered in the next section.

Of course, no discussion of the history of technical analysis would be complete without a primer on the work of Charles Dow and his successors, who gave us what we know as Dow Theory.

CHAPTER 1

The Basic Principle of Technical Analysis—The Trend

From Charles D. Kirkpatrick II and Julie R. Dahlquist, *Technical Analysis: The Complete Resource for Financial Market Technicians*, 3rd Edition (Old Tappan, New Jersey: Pearson Education, Inc., 2016), Chapter 2.

Learning Objective Statements

- Define what is meant by a trend in technical analysis
- Explain why determining the trend is important to analysts
- Identify primary, secondary, short-term, and intraday trends
- Describe the basic beliefs behind the art of technical analysis
- Define "fractal" as used in describing price action

> The art of technical analysis—for it is an art—is to identify trend changes at an early stage and to maintain an investment position until the weight of the evidence indicates that the trend has reversed. (Pring, 2002)

Technical analysis is based on one major assumption: Freely traded, market prices, in general, travel in trends.

Based on this assumption, traders and investors hope to buy a security at the beginning of an upward trend at a low price, ride the trend, and sell the security when the trend ends at a higher price. Although this strategy sounds simple, implementing it is exceedingly complex.

For example, what length trend are we discussing? The trend in stock prices since the Great Depression? The trend in gold prices since 1980? The trend in the Dow Jones Industrial Average (DJIA) in the past year? The trend in Merck stock during the past week? Trends exist in all lengths, from long-term trends that occur over decades to short-term trends that occur from minute to minute.

Trends of different lengths tend to have the same characteristics. In other words, a trend in annual data will behave the same as a trend in five-minute data. Investors must choose which trend is most important for them based on their investment objectives, their personal preferences, and the amount of time they can devote to watching market prices. One investor might be more concerned about the business cycle trend that occurs over several years. Another investor might be more concerned about the trend over the next six months, and a third investor might be most concerned about the intraday trend. Although individual investors and traders have investment time horizons that vary greatly, they can use the same basic methods of analyzing trends because of the commonalities that exist among trends of different lengths.

Trends are obvious in hindsight, but ideally, we would like to spot a new trend right at its beginning, buy, spot its end, and sell. However, this ideal never happens, except by luck. The technical analyst always runs the risk of spotting the beginning of a trend too late and missing potential profit. The analyst who does not spot the ending of the trend holds the security past the price peak and fails to capture all the profits that were possible. On the other hand, if the analyst thinks the trend has ended before it really has and sells the security prematurely, the analyst has then lost potential profits. The technical analyst thus spends a lot of time and brainpower attempting to spot as early as possible when a trend is beginning and ending. This is the reason for studying charts, moving averages, oscillators, support and resistance, and all the other techniques we explore in this book.

The fact that market prices trend has been known for thousands of years. Academics have disputed that markets tend to trend because if it were true, it would spoil their theoretical models. However, recent academic work has shown that the old financial models have many problems when applied to the behavior of real markets. Academics and others traditionally have scorned technical analysis as if it were a cult; as it turns out, however, the almost religious belief in the Efficient Markets Hypothesis has become a cult itself, with adherents unwilling to accept the enormous amount of evidence against it. In fact, technical analysis is very old, developed through practical experience with the trading markets, and has resulted in some sizable fortunes for those following it.

How Does the Technical Analyst Make Money?

Several requirements are needed to convert pure technical analysis into money. The first and most important, of course, is to determine when a trend is beginning or ending. The money is made by "jumping" on the trend as early as possible. Theoretically, this sounds simple, but profiting consistently is not so easy.

The indicators and measurements that technical analysts use to determine the trend are not crystal balls that perfectly predict the future. Under certain market conditions, these tools might not work. Also, a trend can suddenly change direction without warning. Thus, it is imperative that the technical investor be aware of risks and protect against such occurrences causing losses.

From a tactical standpoint, then, the technical investor must decide two things: First, the investor or trader must choose when to enter a position, and second, he must choose when to exit a position. Choosing when to exit a position is composed of two decisions. The investor must choose when to exit the position to capture a profit when price moves in the expected direction. The investor must also choose when to exit the position at a loss when price moves in the opposite direction from what was expected. The wise investor is aware of the risk that the trend might differ from what he expected. Making the decision of what price level to sell and cut losses before even entering into a position is a way in which the investor protects against large losses.

One of the great advantages in technical analysis, because it studies prices, is that a price point can be established at which the investor knows that something is wrong either with the analysis or the financial asset's price behavior. Risk of loss can therefore be determined and quantified right at the beginning of the investment. This ability is not available to other methods of investment. Finally, because actual risk can be determined, money management principles can be applied that will lessen the chance of loss and the risk of what is called **ruin**.

In sum, the basic strategy to make money using technical methods includes

- **"The trend is your friend"**—Play the trend.
- **Don't lose**—Control risk of capital loss.
- **Manage your money**—Avoid ruin.

Technical analysis is used to determine the trend, when it is changing, when it has changed, when to enter a position, when to exit a position, and when the analysis is wrong and the position must be closed. It's as simple as that.

What Is a Trend?

What exactly is this **trend** that the investor wants to ride to make money? An upward trend, or **uptrend**, occurs when prices reach higher peaks and higher troughs. An uptrend looks something like Chart A in Figure 1.1. A downward trend, or **downtrend**, is the opposite: when prices reach lower troughs and lower peaks. Chart B in Figure 1.1 shows this downward trend in price. A **sideways** or **flat trend** occurs when prices trade in a range without significant underlying upward or downward movement. Chart C in Figure 1.1 is an example of a sideways trend; prices move up and down but on average remain at the same level.

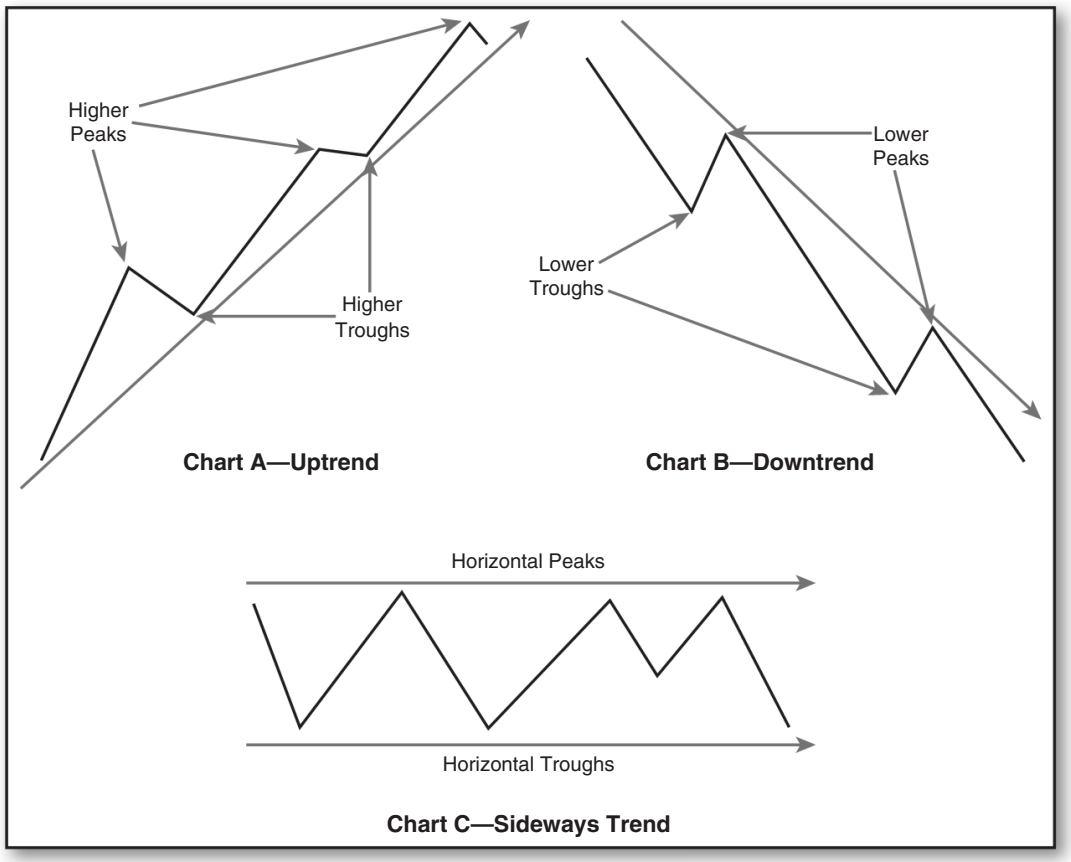

FIGURE 1.1 The Trend

Figure 1.1 shows a theoretical example of an uptrend, downtrend, and sideways trend. But defining a trend in the price of real-world securities is not quite that simple. Price movement does not follow a continuous, uninterrupted line. Small countertrend movements within a trend can make the true trend difficult to identify at times. Also, remember that there are trends of differing lengths. Shorter-term trends are parts of longer-term trends.

From a technical analyst's perspective, **a trend is a directional movement of prices that remains in effect long enough to be identified and still be profitable**. Anything less makes technical analysis useless. If a trend is not identified until it is over, we cannot make money from it. If it is unrecognizable until too late, we cannot make money from it. In retrospect, looking at a graph of prices, for example, many trends can be identified of varying length and magnitude, but such observations are observations of history only. A trend must be recognized early and be long enough for the technician to profit.

How Are Trends Identified?

There are a number of ways to identify trends. One way to determine a trend in a data set is to run a linear least-squares regression. This statistical process will provide information about the trend in security prices. Unfortunately, this particular statistical technique is not of much use to the technical analyst for trend analysis. The regression method depends on a sizable amount of past price data for accurate results. By the time enough historical price data accumulates, the trend is likely changing direction. Despite the tendency for trends to be persistent enough to profit from, they never last forever.

BOX 1.1 LINEAR LEAST-SQUARES REGRESSION

Most spreadsheet software includes a formula for calculating a linear regression line. It uses two sets of related variables and calculates the "best fit" between the data and an imaginary straight (linear) line drawn through the data. In standard price analysis, the two variable data sets are time and price—day d1 and price X1, day d2 and price X2, and so forth. By fitting a line that best describes the data series, we can determine a number of things. First, we can measure the amount by which the actual data varies from the line and, thus, the reliability of the line. Second, we can measure the slope of the line to determine the rate of change in prices over time, and third, we can determine when the line began. The line represents the trend in prices over the period of time studied. It has many useful properties that we will look at later, but for now, all we need to know is that the line defines the trend over the period studied. Appendix A, "Basic Statistics," provides more detailed information about least-squares regression.

Many analysts use moving averages to smooth out and reduce the effect of smaller trends within longer trends.

Another method of identifying trends is to look at a graph of prices for extreme points, tops, and bottoms, separated by reasonable time periods, and to draw lines between these extreme points (see Figure 1.2). These lines are called **trend lines.** This traditional method is an outgrowth of the time before computer graphics software when trend lines were hand drawn. It still works, however. Using this method to define trends, you must define reversal points. By drawing lines between them, top to top and bottom to bottom, we get a "feeling" of price direction and limits. We also get a "feeling" of slope, or the rate of change in prices. Trend lines can define limits to price action, which, if broken, can warn that the trend might be changing.

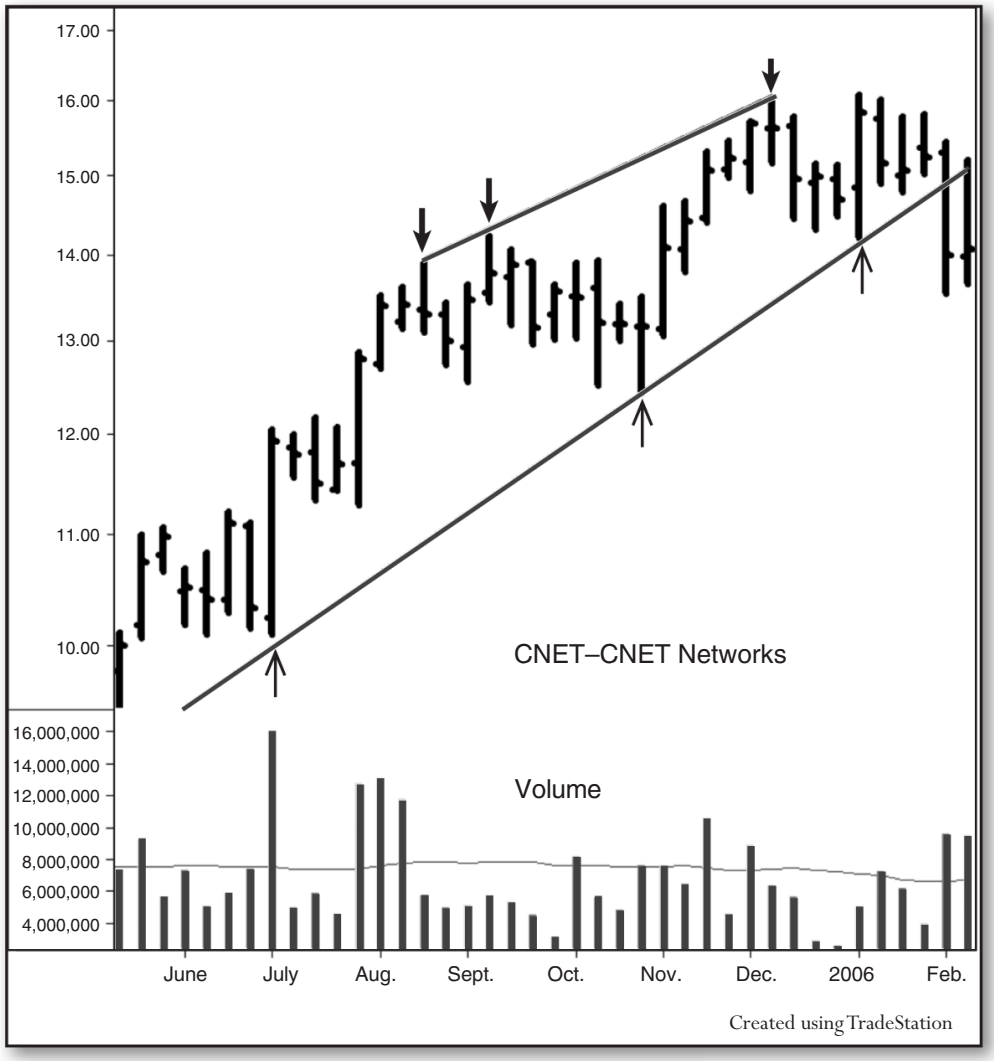

FIGURE 1.2 Hand-Drawn Trend Lines from Top to Top and Bottom to Bottom

Trends Develop from Supply and Demand

As in all markets, whether used cars, grapefruit, real estate, or industrial products, the economic principle of interaction between supply and demand determines prices in trading markets. Each buyer (demand) **bids** for a certain quantity at a certain price, and each seller (supply) offers or **asks** for a certain quantity at a certain price. When the buyer and seller agree and transact, they establish a price for that instant in time. The reasons for buying and selling can be complex—perhaps the seller needs the money, perhaps the seller has learned of unfavorable information, perhaps the buyer heard a rumor in the golf club locker room—whatever the reason, the price is established when all this information is collected, digested, and acted upon through the bid and offer.

Price, therefore, is the end result of all those inexact factors, and it is the result of the supply and demand at that instant in time. When prices change, the change is due to a change in demand or supply or both. The seller might be more anxious; the buyer might have more money to invest—whatever the reason, the price will change and reflect this change in supply or demand. The technical analyst, therefore, watches price and price change and does not particularly worry about the reasons, largely because they are indeterminable.

Remember that many players for many reasons determine supply and demand. In the trading markets, supply and demand may come from long-term investors accumulating or distributing a large position or from a small, short-term trader trying to scalp a few points. The number of players and the number of different reasons for their participation in supply and demand is close to infinite. Thus, **the technical analyst believes it is futile to analyze the components of supply and demand except through the prices it creates**. Where economic information, company information, and other information affecting prices is often vague, late, or misplaced, prices are readily available, are extremely accurate, have historic records, and are specific. What better basis is there for study than this important variable? Furthermore, when one invests or trades, the price is what determines profit or loss, not corporate earnings or Federal Reserve policy. The bottom line, to the technical analyst, is that price is what determines success and, fortunately, for whatever reasons, prices tend to trend.

What Trends Are There?

The number of trend lengths is unlimited. Investors and traders need to determine which length they are most interested in, but the methods of determining when a trend begins and ends are the same regardless of length. This ability for trends to act similarly over different periods is called their **fractal** nature. Fractal patterns or trends exist in nature along shorelines, in snowflakes, and elsewhere. For example, a snowflake is always six-sided—having six branches, if you will. Each branch has a particular, unique pattern made of smaller branches. Using a microscope to look closely at the snowflake, we see that the smaller branches off each larger branch have the same form as the larger branch. This same shape carries to even smaller and smaller branches, each of which has the same pattern as the next larger. This is the fractal nature of snowflakes. The branches, regardless of size, maintain the same pattern. Figure 1.3 shows a computer-generated fractal with each subangle an exact replica of the next larger angle.

The trading markets are similar in that any period we look at—long, medium, or very short—produces trends with the same characteristics and patterns as each other. Thus, for analysis purposes, the length of the trend is irrelevant because the technical principles are applicable to all of them. The trend length of interest is determined solely by the investor's or trader's **period of interest**.

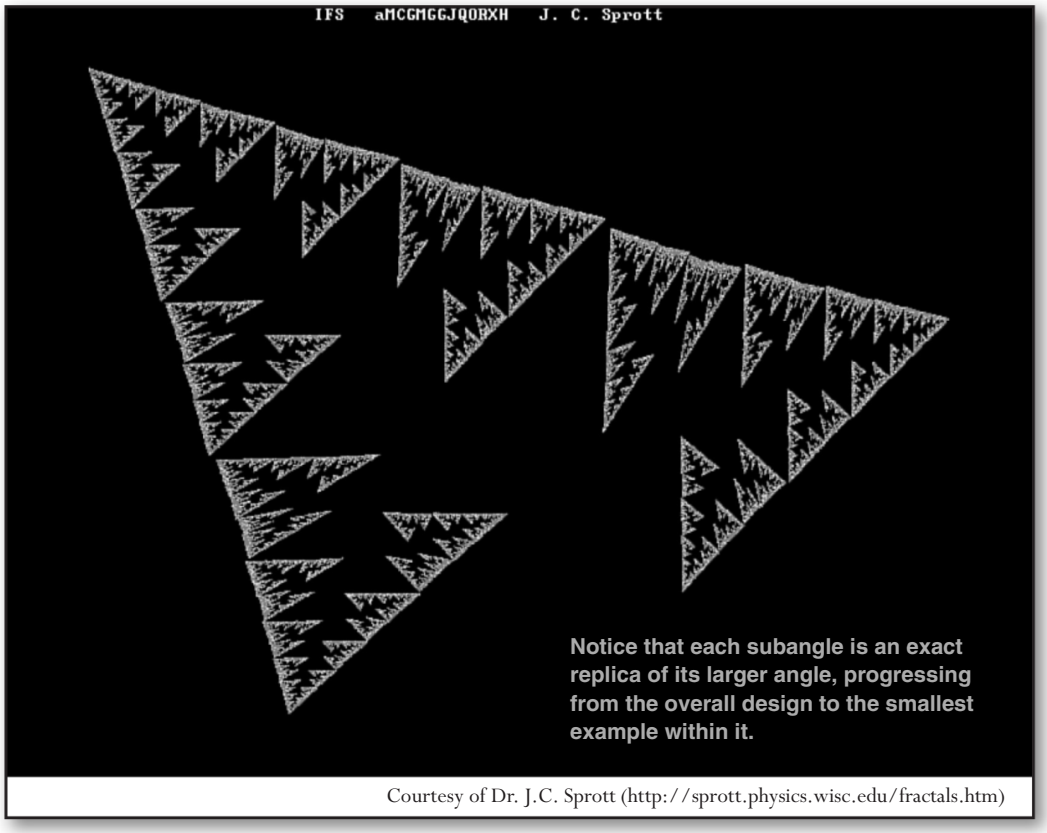

FIGURE 1.3 Example of Computer-Generated Fractal

This is not to say that different trend lengths should be ignored. Because shorter trends make up longer trends, any analysis of a period of interest must include analysis of the longer and shorter trends around it. For example, the trader interested in ten-week trends should also analyze trends longer than ten weeks because a longer trend will affect the shorter trend. Likewise, a trend shorter than ten weeks should be analyzed because it will often give early signals of a change in direction in the larger, ten-week trend. Thus, whatever trend the trader or investor selects as the trend of interest, the trends of the next longer and next shorter periods should also be analyzed.

For identification purposes, technical analysts have divided trends into several broad, arbitrary categories. These are the primary trend (measured in months or years), the secondary or intermediate trend (measured in weeks or months), the short-term trend (measured in days), and the intraday trend (measured in minutes or hours). Except for the intraday trend, Charles H. Dow, founder of the Dow Jones Company and the *Wall Street Journal,* first advanced this division in the nineteenth century. Charles Dow also was one of the first to identify technical means of determining when the primary trend had reversed direction. Because of his major contributions to the field, Dow is known as the "father" of technical analysis.