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# THE HANDBOOK OF **TECHNICAL ANALYSIS**

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**THE PRACTITIONER'S COMPREHENSIVE GUIDE  
TO TECHNICAL ANALYSIS**

**MARK ANDREW LIM**

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**IFTA CFTe Level I & II (USA)**

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# **The Handbook of Technical Analysis**

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# The Handbook of Technical Analysis

***The Practitioner's Comprehensive Guide  
to Technical Analysis***

MARK ANDREW LIM

WILEY

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*I dedicate this work to my family, for their unconditional support and encouragement through thick and thin.*



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# Foreword

I sincerely believe that this handbook is a feast for serious technical traders as well as for hardcore technical analysis practitioners. This handbook is especially meant for beginner professionals looking to improve their trading performance, and in the process, trying to avoid some of the more painful collisions with complex charting theories. I wish I had this book years ago. That said, I enjoy reading it today, finding Mark's pearls of wisdom an aid to improve my technical trading.

Mark is one of Malaysia's distinguished technical analysis gurus whose dazzling mind produces more fresh ideas in a book than most other experts in an entire lifetime. Since knowing him back in 2002, he has been an influential mentor and a respectable trader, becoming well known from 2002 to 2007 as being one of Malaysia's finest traders. Most of his trading techniques and theories in the handbook are now included in most of my trading programs.

There are a lot of books on technical analysis. Most of them concentrate on very specific items, exploring a particular concept in great depth. A long and detailed handbook covering a broad range of topics with practical value such as this is much more difficult to find. Mark gives his readers diverse market indicators to identify positive investment climates, backing them up with in-depth theoretical explanations and real-world chart examples. He exposes powerful technical signals and uncovers some of the most obscure concepts in technical analysis, reducing them to a set of very clear and lucid rules.

I believe that this handbook provides an excellent starting point, as well as a comprehensive reference text for technically orientated practitioners. It outlines the primary principles of technical analysis and provides a solid foundation for moving forward into more advanced and cutting-edge concepts. For the experienced trader, this book will also serve as a reliable refresher, reinforcing good technical trading practices that are both enduring and effective. It explains technical trading in a clear and easily understandable format, examining entire concepts, from start to finish. All techniques discussed are succinctly illustrated with clear chart examples.

Mark's handbook points the way for readers interested in the master chartist approach. He distils his vast market expertise into a simple set of technical guidelines and rules. As an example, Mark explains why he believes the markets respond in specific behavioral manner to phenomena such as volume divergence and breakaway gaps. His chapter on volume and volatility also makes it clear why market tops react in a certain manner before the 'storm' and why market bottoms tend to 'storm' before the rebound. These simple but yet profound concepts will change the way many readers approach trading and investing in the markets.

I congratulate Mark on his hard work in producing this profound handbook. It is a big achievement for the technical analysis community and we are proud

of his contribution. Finally, I believe that the only thing readers need to do after reading this handbook is to make a commitment to apply his work, with the appropriate mind-set to become successful traders and investors.

I wish all readers and technical analysis fans lots of success, happy learning, and trading with technical analysis!

–Dr. Nazri Khan,

MSTA, CFTe, President, Malaysian Association of Technical Analyst  
(MATA); Vice President, Affin Investment Bank Malaysia

# Preface

**T**he *Handbook of Technical Analysis* provides a unique and comprehensive reference for serious traders, analysts, and practitioners of technical analysis. This book explains the definitions, concepts, applications, integration, and execution of many technical-based trading tools and approaches, with detailed coverage of various technical and advanced money management issues. It also exposes the many strengths and weaknesses of various popular technical approaches and offers effective solutions wherever possible. Innovative techniques for pinpointing and handling potential market breakouts and reversals are also discussed throughout the handbook. A dedicated chapter on advanced money management helps complete the trader's education.

This handbook will prove indispensable to foreign exchange, bond, stock, commodity futures, CFD, and option traders, especially if they are looking for a fast and comprehensive route to mastering some of the most powerful tools and techniques available for analyzing price and market behavior. It is replete with hundreds of illustrations, tables, and charts, giving the trader and investor an instant visual understanding of the underlying principles and concepts discussed. Markets analyzed include bonds, commodity, equities, and foreign exchange.

With extensive content and coverage, *The Handbook of Technical Analysis* also provides the perfect self-contained, self-study exam preparatory guide for students intending to sit for examinations in financial technical analysis. This book helps prepare students to sit for various professional examinations in financial technical analysis, such as the International Federation of Technical Analysts CFTe Levels I and II (USA), STA Diploma (UK), Dip TA (AUS), as well as the Market Technicians Association CMT Levels I, II, and III (USA) examinations in financial technical analysis. This handbook is organized in an accessible manner that allows the students to readily identify the topics and concepts that they will need to know for the exam. It covers the most important topics, as well as incorporating the latest technical developments in the markets so as to give the students a real-world appreciation of the topics learned. The student will find important learning outcomes at the beginning of each chapter.

*The Handbook of Technical Analysis* aims to be as visual as possible. Most of the charts and illustrations in this handbook were created with the objective that they would provide a rapid and efficient review of all the concepts and applications upon the second or third reading. This makes it the perfect tool for students reviewing for an examination.

## OVERVIEW OF THE BOOK CONTENTS

Chapter 1 (Introduction to the Art and Science of Technical Analysis) introduces the reader to the general assumptions, approaches, and classifications associated with the application of technical analysis. It introduces the concept of the self-fulfilling

prophecy and information discounting and deals with the issue of subjectivity in technical analysis.

Chapter 2 (Introduction to Dow Theory) introduces the basic concept of Dow Theory and its various tenets. It also deals with the current challenges and applicability of Dow Theory. Much of modern classical technical analysis is derived on the original assumptions of Dow Theory, and as such represents an important chapter.

Chapter 3 (Mechanics and Dynamics of Charting) describes the mechanics of chart construction and how price is quantized and filtered into OHLC data. The significance of OHLC data is dealt with in detail, including four different definitions of gaps. Charts are classified in terms of five different constant measures and how they are affected by the type of chart scaling employed. There is also a detailed discussion about how trade performance and reward to risk ratios are affected by the bid-ask spread, with respect to long and short entry and exit orders. Finally, various types of futures contracts are covered, focusing on rollover premiums and discounts, backwardation, contango, and back-adjusted and unadjusted futures charts.

Chapter 4 (Market Phase Analysis) deals specifically with market phase, describing the various phases via numerous technical approaches. It analyzes and interprets market phase in terms of volume and open interest action, chart patterns, moving averages, divergence, price momentum, sentiment, cyclic action, Elliott waves, and Sakata's method. This helps the practitioner better anticipate and forecast potential phases in the market with more consistency.

Chapter 5 (Trend Analysis) deals with the various definitional issues associated with trend action. It also introduces the reader to the concept of wave degrees or cycles. It points out that the inability to identify wave degrees may very well result in ineffective technical analysis and trade performance. The chapter then covers the 16 important price action characteristics that will greatly improve the forecastability of potential reversal and continuation in the markets. The *bar stochastic ratio oscillator* is also introduced. Price filters are discussed in detail and classified into three main categories. This is followed by the description of the various types of trade orders and their functions. The chapter also covers stoplosses and their relationship with proportional sizing. Trendlines, channel construction, fan lines, trend retracements, price gaps, trend reversal forecasts, and continuations are also covered in detail.

Chapter 6 (Volume and Open Interest) deals with volume and open interest action and defines volume divergence with respect to price-based and non-price-based volume indicators. VWAP, volume filters, volume cycles, and various volume oscillators are also discussed, pinpointing some of their weaknesses and possible solutions.

Chapter 7 (Bar Chart Analysis) covers bar chart analysis. It presents the reader various generic reversal and continuation setups with respect to single, double, triple, and multiple price bar formations. It also describes the significance of the 16 price action characteristics and how they can be employed to forecast potential price bar reversals and continuations in the market. Finally, various popular price bar formations are discussed via numerous chart examples.

Chapter 8 (Window Oscillators and Overlay Indicators) classifies indicators into window oscillators and price overlay indicators. Overlay indicators are further subdivided into numerical, geometrical, horizontal, and algorithmic indicators. The differences between static and dynamic indicators are also explained. The practitioner is then introduced to the seven main approaches to analyzing oscillators. Cycle tuned oscillators, multiple timeframe oscillator analysis, and various popular oscillators and indicators are described in detail.

Chapter 9 (Divergence Analysis) describes the application of divergence in technical analysis. Detailed coverage of the definitional issues helps clarify the confusion surrounding the topic. The practitioner is introduced to bullish, bearish, standard, and reverse divergence. Various explanations are also presented with respect to the functioning of reverse divergence. The concepts of double divergence, detrending, and signal alternation are also covered in detail. The chapter concludes with numerous chart examples illustrating the various forms of divergence in equities and commodities.

Chapter 10 (Fibonacci Number and Ratio Analysis) introduces the practitioner to Fibonacci ratio and number analysis. It covers Fibonacci retracements, extensions, expansions, and projections with numerous chart examples. All Fibonacci calculations are clearly explained and illustrated. The differences between numerically and geometrically based Fibonacci operations are also discussed. Guidelines for drawing Fibonacci retracements in single, double, and multiple leg retracements are covered in detail. Fibonacci price and time ratio analysis of Elliot waves are also explored. Various popular Fibonacci applications such as fan lines, channel expansions, and arc projections are illustrated via real-world charts.

Chapter 11 (Moving Averages) analyzes various moving averages, such as exponential, simple, and weighted moving averages. The practitioner is shown how to calculate various averages. The chapter extensively covers the seven main components and nine main applications of moving averages. Moving averages functioning as signals and triggers are also discussed.

Chapter 12 (Envelopes and Methods of Price Containment) covers price bands or envelopes and their various modes of price containment. The practitioner is introduced to the six main functions of a price envelope. The different forms of central value that may be adopted by an envelope and the construction of the upper and lower bands are also analyzed in detail. The practitioner is then shown how to tune the bands with respect to the dominant cycles in the markets. The five main forms of price containment are illustrated with suggestions for effective entry and exit of the bands.

Chapter 13 (Chart Pattern Analysis) discusses the application of chart pattern analysis. A detailed breakdown of the classification of chart patterns is presented with specific examples. There is extensive coverage of the minimum measuring objective, conditions for pattern completion, and alternative price targets. The chapter concludes with the extensive treatment of many popular reversal and continuation chart patterns.

Chapter 14 (Japanese Candlestick Analysis) introduces the practitioner to Japanese candlestick analysis. Many of the most popular Japanese candlestick formations are presented and covered in detail. Japanese candlestick formations

should be read within the context of the market, and this is achieved with reference to the 16 price action characteristics discussed extensively in this chapter. The practitioner is then shown how to integrate Japanese candlestick analysis with other forms of technical analysis, such as cycles, chart patterns, oscillators, Ichimoku Kinko Hyu charting, Fibonacci levels, volume action, and moving averages.

Chapter 15 (Point-and-Figure Charting) covers Point-and-Figure charting, focusing on the minimum continuation and reversal box size, vertical and horizontal counts, box filtering, and the effects of chart scaling, as well as coverage of the most popular point and figure formations.

Chapter 16 (Ichimoku Charting and Analysis) presents a powerful set of price overlay indicators, collectively referred to as Ichimoku Kinko Hyu charting. The chapter focuses on the construction, analysis, and application of the various overlays with special attention to the time displacement and lookback periods. Methods of trend identification, potential reversals, and continuations are also discussed with respect to the various Ichimoku overlays.

Chapter 17 (Market Profile) covers market profile charting. There is detailed treatment of the value area calculation, determination of the Point of Control via Time Price Opportunity (TPO) count and volume, as well as coverage of the various popular TPO distributions.

Chapter 18 (Basic Elliott Wave Analysis) introduces Elliott wave analysis with special focus on wave construction, alternation, truncations, impulsive and corrective wave formations, as well as the application of Fibonacci ratio and number analysis to the Elliott wave structure. The significance of pattern, time, and ratio is also discussed.

Chapter 19 (Basics of Gann Analysis) covers some of the most popular Gann techniques for forecasting potential price reversals, which includes the squaring of price and range, squaring of the high and low, the square of nine time and price projections, Gann lines, Gann retracements, and Gann grids.

Chapter 20 (Cycle Analysis) covers the basic elements of cycle analysis. The principle of summation, harmonicity, proportional commonality, nominality, variation, and synchronicity are covered in detail. Cycle inversions, translations, and the tuning of oscillators to the dominant cycle are illustrated clearly on various charts. The practitioner is also presented with five basic approaches to identifying cycles.

Chapter 21 (Volatility Analysis) discusses the five measures of market and price volatility. There is also coverage of the concept of normal and standard deviation, mean deviation, skewness, kurtosis, average true range, and stock beta. Plus there is discussion of the volatility indices and their application.

Chapter 22 (Market Breadth) covers the elements and factors that affect the reliability and consistency of market breadth analysis. Market fields and components such as its nine breadth data fields and eleven data operations are discussed in detail. Various popular market breadth indicators and their applications are then illustrated via numerous equity and commodity charts.

Chapter 23 (Sentiment Indicators and Contrary Opinion) introduces the topic of sentiment analysis and analyzes the behavior and psychology of the market participants. The chapter covers contrary opinion, irrationality, and necessary conditions for the reliability of sentiment indicators. Various popular sentiment indicators are examined with the appropriate charts.

Chapter 24 (Relative Strength Analysis) is about measuring the relative strength of one market against another. The directional implications and definitions such as underperformance and outperformance are explained with various examples. The application of technical analysis to RS lines is examined and illustrated via numerous charts.

Chapter 25 (Investor Psychology) covers the basic elements of investor psychology. The chapter discusses how trends, consolidations, and market reversals develop with respect to various psychological and emotional biases. It also describes the underlying forces that create chart patterns in terms of the biases of investors and traders. Topics relating to cognitive dissonance and positive feedback loops are covered in detail.

Chapter 26 (Trader Risk Profiling and Position Analysis) introduces the practitioner to trader profiling. The practitioner is exposed to the concept of risk capacity and is shown that most market participants are usually both risk averse and risk seeking at the same time, with respect to price, time, and risk size. Trade orders based on behavioral profile are also discussed in detail. The collection of bullish and bearish indications across multiple timeframes is discussed in terms of the long, medium, and shorter term trader and investor.

Chapter 27 (Integrated Technical Analysis) introduces the concept of integrated technical analysis. It shows the practitioner how to effectively combine various technical tools to achieve better forecasts and trade decisions. It stresses the importance of identifying significant bullish and bearish clustering and oscillator signal agreements in order to locate high probability trades. Multiple timeframe analysis and multicollinearity are also discussed in detail.

Chapter 28 (Money Management) covers the elements of money management for traders. It classifies money management into passive and dynamic exposures. The four stochastic exit mechanisms are introduced and explained in detail. The concept of linear and geometric expectancy, asymmetric leverage, minimum winning percentage, and win-loss distribution are discussed from the perspective of improving trade performance. Familiarity with the concepts and disciplined application of passive and dynamic components of money management are essential skills for the long-term survivability as a trader.

Chapter 29 (Technical Trading Systems) introduces the practitioner to the basic elements of constructing, testing, and optimizing technical trading systems. It covers system conceptualization, system components, and performance measurement specifications.

Appendix A (Basic Investment Decision Making Based on Chart Analysis) illustrates how charts are employed to make trading and investment decisions. The practitioner is shown how to describe both the stock and the climate or environment in which the stock is trading in bullish and bearish terms and how to identify various participatory options available in the stock with respect to the client risk capacity and expectation.

Appendix B (Official IFTA CFTe, STA Diploma (UK), and MTA CMT Exam Reading Lists) provides a list of the official IFTA CFTe, STA Diploma (UK), and MTA CMT exam reading requirements.

This book also includes an overview of the companion website and test bank.

## ONLINE MATERIALS

This book also includes access to a companion website ([www.wiley.com/go/limta](http://www.wiley.com/go/limta)) that includes:

- An online test bank based on the topics outlined in the official syllabuses for both the MTA and IFTA professional examinations
- Answers to the end-of-chapter questions in the book
- Excel spreadsheets that help illustrate the mathematics underlying various technical and money management concepts within the handbook
- Updated charts
- Additional content on new topics added to the exams

For instructions on accessing the test bank, please refer to the About the Test Bank and Website at the end of this book.

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The charts in this book are sourced, with kind permission, from Stockcharts.com and MetaQuotes Software Corp. Note that MetaTrader is a trademark of MetaQuotes Software Corp.



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**M**ark Lim graduated from King's College London in Special Physics. He was awarded the Bronwen Wood Memorial Prize in financial technical analysis by the Society of Technical Analysis (UK) in 2007. He holds both the MSTA (UK) and the International Federation of Technical Analysts CFTe designations and is a full member of the Society of Technical Analysis (UK). Mark's expertise includes stock, CFDs, commodity futures, and options trading. He is currently involved with mathematics and physics at the postgraduate level.

Mark is the author of *The Profitable Art and Science of Vibratrading* (Wiley, 2011). He is also a contributing author of *The Wiley Trading Guide Volume II*. He conducts a range of technical analysis and trading Masterclasses via online webinars and on-site seminars, covering intermediate to advanced profit extraction methodologies for directional and nondirectional trading.

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# CHAPTER 1

# Introduction to the Art and Science of Technical Analysis

## LEARNING OBJECTIVES

After studying this chapter, you should be able to:

- Understand the key concepts underlying technical analysis
- Identify the different forms of chart analysis
- Describe the objectives of technical analysis
- Understand what subjectivity means in technical analysis
- Recognize the strengths and weaknesses of technical analysis
- Categorize market participants according to style and time in markets
- Identify the various styles and approaches in technical analysis

**T**echnical analysis is a fascinating field of study. It is as much science as it is art. Its main strength is that a lot of it is visual, giving practitioners a better feel of the underlying dynamics of the markets. We shall also be looking at the various challenges to technical analysis, their resolution, and how technical analysis affects trading in general. The classification of technical approaches, market participants, and various markets will also be discussed in detail.

## 1.1 MAIN OBJECTIVE OF TECHNICAL ANALYSIS

It is generally accepted that human beings are born with certain instincts, tempered and molded by evolution via the passing of time. Every human being strives and seeks to fulfill these powerful instinctive forces.

The three main motivational instincts are:

1. The instinct to survive
2. The instinct for comfort
3. The instinct to propagate

The instinct to survive is probably the strongest and most overpowering. Survival almost always precedes the need for comfort or to propagate the species. The instinct to survive includes:

- The instinct to stay alive
- The instinct to satisfy hunger
- The instinct to seek safety, that is, being in a group/herd
- The instinct to avoid danger (by having natural fears like the fear of fire, loud sounds, heights, etc.)

This powerful instinct to survive is the main driving force in life for striving to make a profit. But in order to make a profit to ensure continued survival, there must be a positive change in the actual or perceived value of something that we own. This change in value of some variable may be anything that will allow us to profit from change. *One very popular and convenient variable of change is price.* We can participate in this price change by satisfying a very simple mechanical rule that will ensure profitability every single time, which is to always buy when prices are low and sell when they are higher, popularly referred to as the *buy low, sell high* principle. See Figure 1.1.

Unfortunately, in order to satisfy this simple rule of guaranteed profitability, we need to be able to do more of one thing, which is to be able to determine the direction of price ahead of time in order to know exactly *when* to buy low and subsequently sell higher. Hence, it is not only the mechanical action of buying low and selling high that counts, but also the *timing* of the action itself that is critical. This



**FIGURE 1.1** The Mechanics of Profiting from a Change.

introduces an element of chance or probability into an otherwise fairly straightforward mechanical venture. Profitability therefore requires effective and efficient action in two dimensions, that is, price and time. Traders and analysts keep track of this action using a two-dimensional visualization tool, that is, a price-time chart, which tracks price on the vertical axis and time on horizontal axis.

In short, the ability to forecast or predict price or market action in a reasonably accurate fashion represents one of the skills that may be critical for longer-term success as a professional trader or analyst.

## 1.2 DUAL FUNCTION OF TECHNICAL ANALYSIS

Technical analysis essentially serves *two* main functions:

1. *For Identification:* It identifies and describes past and present price action. It serves as a historical record of what has transpired in the markets. It provides a descriptive representation of market action. This allows the market practitioner to observe how the market has performed in the past, which includes its average volatility over a specified period; its highest and lowest historical price extremes; the common areas of consolidation, average duration, and price excursion of trends; the amount of liquidity and participation in the markets; the average degree and frequency of price gapping; the impact of various monetary economic announcements on price, and so on. This information is especially critical prior to any investment or trading decision.
2. *For Forecasting:* Once a particular price or market action is identified, the practitioner may now use this information to interpret what the data actually means before inferring future price action. This inference about potential price action is wholly based on the assumption that price patterns are repetitive to some reasonable degree and therefore may be used as a basis for price predictions.

## 1.3 FORECASTING PRICE AND MARKET ACTION

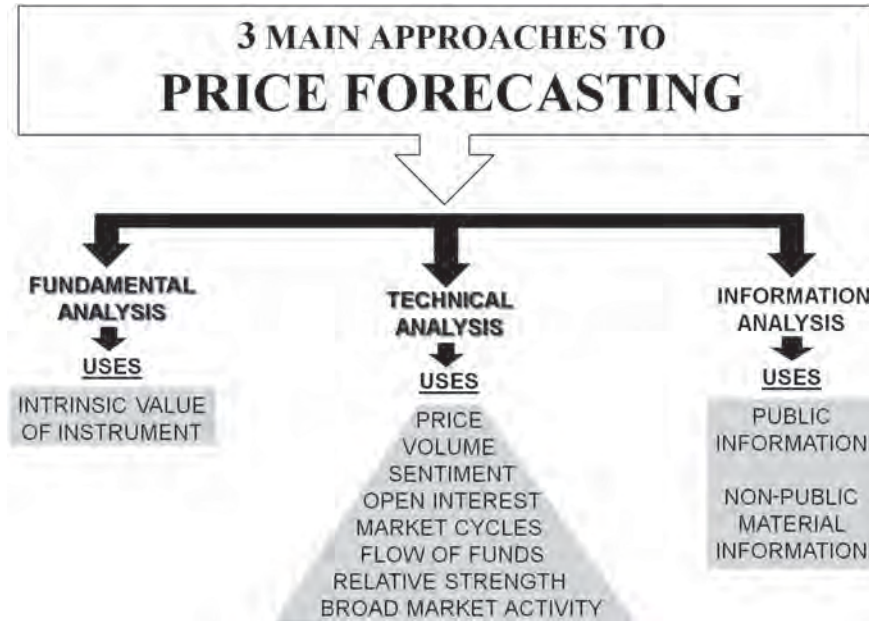
There are three main approaches to predicting potential future price action or behavior, namely via:

1. Fundamental Analysis
2. Technical Analysis
3. Information Analysis

See Figure 1.2.

### Forecasting Stock Prices Using Fundamental Analysis

One way to gauge the potential price of a stock is by analyzing the company's performance via its financial statements and accounts in order to determine its *intrinsic value* or the worth of the security in light of all its holdings, debt, earnings, dividends, income and balance sheet activity, cash flow, and so on. This accounting information is nor-



**FIGURE 1.2** Three Approaches to Price Forecasting.

mally represented in ratio form, as in price to earnings (P/E), price to earnings growth (PEG), price to book, price to sales, and debt to equity ratios, to name but a few.

The logic is that a strongly performing company *should continue to perform well into the future* and garner more demand from investors excited to participate in the expected capital gains derived from the stock's price and appreciating dividend yields. The price of a stock is expected to rise if there are sufficient buyers, signifying a *demand* for it. Conversely, the price of a stock is expected to decline if there are sufficient sellers, signifying an *oversupply* in the stock. Demand is potentially generated if the current stock price is below its estimated intrinsic value, that is, it is currently *undervalued* or *underpriced*, whereas supply is created if the current stock price is above its estimated intrinsic value, that is, it is currently *overvalued* or *overpriced*. See Figures 1.3 and 1.4 for illustrations of using intrinsic value to forecast potential stock price movements.



**FIGURE 1.3** Price Forecasting Based on Intrinsic Value of a Stock.