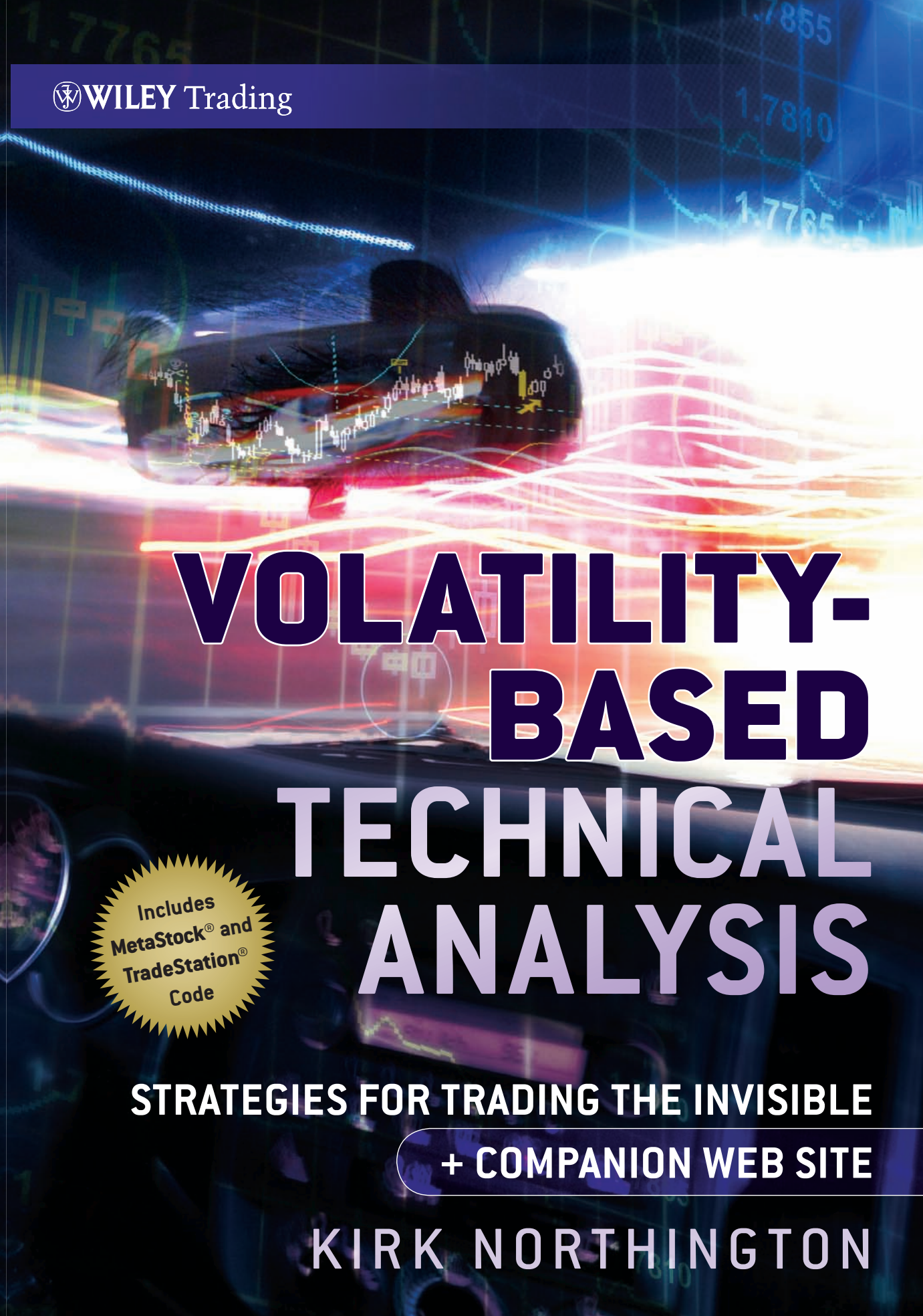
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Volatility-Based Technical Analysis

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Volatility-Based Technical Analysis

Strategies for Trading the Invisible

KIRK NORTHINGTON

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For my wife Faith …
only with her unceasing belief in me
was this book written.

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Preface

For years, I have participated in regular group meetings of private and professional traders. It is always at a nighttime venue because the markets or careers occupy everyone during the daytime hours. No matter what the individual's skill level or success rate, I see a common trait in all of them. Each person possesses a strong belief that he can be successful at trading, regardless of whether that belief is well founded.

I have also observed a decided shift toward technical analysis and away from fundamental trading. It's partly because corporations have proven themselves to be unreliable information sources, but also because an abundance of vendors tout overly simplified technical analysis products and services. No matter how you slice it up, traders—professional and private—are led astray by most market services. Certainly, we all deserve better.

I wrote this book to bridge the technical analysis advantage gap between resource-rich institutions and ill-equipped individual traders. The nonutilization of volatility measurement defines this great divide. Programmable technical analysis software is the vehicle that enables the smaller professional and private trader to level the playing field.

As a beginning trader, I marveled at the many technical analysis indicators and techniques that could be applied to the chart. I longed to predict the distinct reversal points that appeared before me every week. As so many classic technical analysis methods and indicators only intermittently displayed success, I began to realize that the market-moving players were armed much differently from the way I was. I decided that on each chart there exists a structure that I could not see, but it was there nonetheless; and I was going to find out how to uncover it.

I have encountered many private traders who rely on options without ever buying or selling the actual underlying stock. These individuals today are more the rule than the exception, and yet technical analysis has left detecting option-spread trades to be largely a guessing game. This has caused many to overly rely solely on Greek values, and the plethora of graphs created to express them, while ignoring basic chart technical analysis. My belief is that volatility-based support and resistance is there to serve all traders. It is ironically the market's vast preference for options, and thus option-valuation mathematics, that actually propels the effectiveness of *Volatility-Based Technical Analysis.*

INTENDED AUDIENCE

This book is intended for those who want technical analysis to adapt to the volatility forces at work in today's markets. Most traders understand the importance of using methods that are largely unknown to the greater community. If you want to better understand the relatively simple arithmetic volatility measuring techniques, and how to incorporate them into indicators of your own adaptation or design, then you will benefit from this content. There are unobstructed processes, of which most people are capable, that enable today's programmable technical analysis software to give them an advantage. This book explains the reasons why technical analysis should incorporate volatility measurement in virtually every indicator, component, and algorithm.

WHAT'S INSIDE?

Part One gives you an understanding of the many obstacles that individual traders must overcome to level the playing field. It carefully lays out why the markets have changed since 2000, and thus produced the need for volatility measurement in all aspects of technical analysis. It also provides some important groundwork material to prepare you for understanding the purpose and usage of volatility analysis.

Part Two explores arithmetic measurements of volatility within exercises that create custom indicators. This is a calculus-free zone; only high school math is used. This section delves into specific techniques for creating indicators. It also focuses on retrofitting classic technical indicators with volatility measurement. Also, the concept of *Projected Implied Volatility* (PIV) is introduced.

Part Three continues the process of developing volatility-based technical analysis components, with an emphasis on solving some classic technical analysis weaknesses, such as trend compensation. This section delves deeply into the importance and methods of forecasting the broad market's short- and intermediate-term direction. Exact trade setups are the focus of Part Three. The concept of *Volatility Shift* in particular is introduced, along with specific ways to exploit it. Part Three culminates in the practice of using the scientific method to develop trading system components. A simple component testing routine, complete with code, is also explored.

Appendix A duplicates all of this book's code as TradeStation EasyLanguage code, complete with charts.

Appendix B explores in-depth methods for finding high probability option spread trades: Condors, Butterflies, Strangles, and Straddles. This is done using the MetaSwing system. Where feasible, care is taken to present statistically valid test results.

Appendix C explains the resources available to you at this book's companion web site, tradingtheinvisible.com.

All of the indicator examples in the book are coded in MetaStock Function Language to show the simplicity of coding, and that most anyone can do it. Over 180 charts are also included in the text, designed to be large and descriptive.

This book also lays out how finding profitable exits, within a set time frame, should be a goal of every trader. Enhancing almost any technical analysis method or calculation with volatility measurement provides the highest probability exit signals. The activity of increasing each trade's profit, or lessening its loss, has always seemed to be a universal desire of private traders.

Life as a private trader can be a solitary existence in the physical and the informational context. Understanding the broader market's short-term bias using the volatility of market breadth is perhaps the most underused gift we all receive. And yet so many look right through it every day. In Chapter 13 you will find the algorithms and source code for the MetaSwing Correction Surge system released. It provides an early warning system for the short- and intermediate-term market direction and corrective events. This system kept Northington Trading profitable during the fall market crash of 2008, and for that matter throughout all of 2008. It is a calculation and methodology that any trader can implement and use effectively.

Ultimately, the business of trading depends on your ability to make well-balanced decisions at times when the act of decision making is hardest. In Chapter 6, a methodology called the Framework is presented. When the Framework is adapted to the specifics of your trading methods, great clarity is gained, in that it more clearly identifies the pieces of a method that work or show weakness. Its strength is garnered by the proper use of component cross-verification. The net result is better trading decisions.

KIRK NORTHINGTON

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Carson Dahlberg, CMT, is the head of the Charlotte, North Carolina, chapter of the Market Technicians Association. Carson contributed a significant amount of time and expertise in providing peer review for this book's original content. His insights showed me better ways to emphasize its practices. Derek Hernquist is the Chief Investment Officer at Integrative Capital, LLC, and also employed his market knowledge for peer review. Derek's understanding of the underlying logic required when creating new methods was very insightful for me as a first-time author. My good friend Pamela Dennis was quite helpful by providing the quintessential private trader's take on new market realities and the need to keep trading methods grounded.

In so many ways, my wife, Faith, deserves thanks and credit for keeping this book's content grounded and straightforward. She tirelessly listened to my endless technical explanations, only to yawn and remind me that making methods simple is always best.

I also want to thank Jeffrey Gibby, Kelly Clement, Heidi Browning, and all the good folks at Equis International for their support and assistance with the evaluation of some advanced analysis techniques, and for providing additional peer review.

On any given day, I could always rely on the master swing trader Alan Farley to enlighten me with concise and meaningful answers to some deep questions. He's never been too busy to reply to my e-mails and share his expertise.

I would also like to extend my appreciation to Megan Sordo, Janette Perez, and Jacqueline Reyna at TradeStation Securities, Inc. They are always great to work with.

My gratitude is also extended to Richard Saidenberg for lending his TradeStation EasyLanguage expertise at some critical times. Richard is available at ricksaidenberg@spitfire.net, or (914) 769–5164.

Throughout the body of this book, MetaStock charts are the courtesy of Equis International, a Thomson Reuters company. In Appendix A, all charts were created with TradeStation, TradeStation Technologies, Inc. All rights reserved. The high levels of professionalism at both of these companies make them terrific to work with.

Lastly, I want to thank my cat, Summer. It was a great help to have her always resting on my desk, giving her opinions on this book's most complex trading methods, and making the really big decisions.

K. N.

PART ONE

Are You Prepared?

Have you ever had the dream where you are unprepared for the exam? Upon showing up for a class you find out that there is an important exam scheduled for that hour. Not only have you not studied, but strangely you don't even remember having attended any of the prior lectures. This is a common "dream you can't forget" according to Gillian Holloway, author of *The Complete Dream Book.*[1]

If you trade the markets, I hope you have had this dream many times. Its nickname is "the overachiever's nightmare," because it is so common for successful people to experience it. The dream seems to occur most often when an individual assumes "responsibilities that increase what he expects of himself." It seems to signal to a person the need for accountability, performance, and preparation. Indeed, Part One of this book focuses on the need for all technical traders to adapt and prepare for the increasing role of volatility in the financial markets.

The first three chapters of this book deal heavily with the recognition of how market participants have changed, and the challenges these changes present. It should also open your eyes to your opportunity to transform your methods and prepare yourself. Perhaps it can even help you avoid those embarrassing classroom exam situations.

Chapter 1: The Challenges presents your market competitors and their daunting capabilities. The information in it is quite an eye opener for most private traders; it may even instill a splinter of fear into your psyche. A healthy amount of fear has kept mankind alive since fire was considered high tech.

Chapter 2: The Opportunities introduces the many realistic opportunities that await you, if you can adapt. Each of the specific challenges presented in Chapter 1 are initially countered. You will begin to understand the advantages possible with volatility-based technical analysis.

Chapter 3: The Foundation gives you important information to best use the balance of the book. Important technical analysis tenets are covered, along with a quickstart primer of MetaSwing.

CHAPTER 1

The Challenges

Who wants to walk up to an ATM, put in $10,000, and then take out $11,000? I'm going to go out on a limb here and say we'd all love to do that. In a sense, though, isn't that what trading is? We buy shares of a stock through a small computer program interface to a brokerage firm. Then flip over to your browser and see what's going on at the CNN web site. "Hmm," you wonder, "I can't wait to buy that new suit I was eyeing yesterday with the money this trade will make." Later, we sell the shares and walk away with more money in our account than we started with. Doesn't that feel good?

Of course, we all know better than that. We know that there is a realistic chance that we may only get back $9,000, or less. And that's not even mentioning that we can't directly touch this magical ATM, which is the financial markets. There's a guy standing in front of the ATM, and he's going to operate the ATM for you. He's also going to take a small piece of that $10,000, going in and coming out.

So the real question is, "Do most people really know what's going on inside the magical ATM?"

Before we get to that, though, it's important to keep in mind that if you actually succeed in taking out $11,000 after you have put in only $10,000, some other poor soul is getting back only $9,000 on his $10,000 deposit. The only way a person makes money in the financial markets is if someone else loses money. This means your task is to take someone else's money. If this concept bothers you, then maybe active trading is not your brand of coffee. If that's true, then give your money to a mutual fund manager and let him attempt to grab someone else's cash. Most beginning traders don't realize this and your broker—online or flesh and blood—is in no hurry to tell you this, or the rest of what you will read in this chapter.

Trading is a battle, a competition, a game with no second place. If, at the end of the week, you realize that your trading account is $500 lower, there isn't anyone who's going to console you or tell you that everything's going to be okay. That person is busy eating lobster and celebrating the good week he had taking money away from a bunch of poorly

prepared retail traders. That person is an institutional trader with a support staff of quantitative analysts who provide him with high probability strategies and resources.

My intention is not to scare you away from trading. Trading financial markets is a wonderful and often rewarding experience. Indeed, with the well-deserved death of "buy and hold," and the ever-increasing rise of systemic risk, it's the best way to get decent returns in the market. Whether making money or losing it, anyone who experiences trading will walk away an improved person. She may be richer or she may be poorer, but she will have improved in some way. She will most definitely understand things about herself she did not know before. Everyone will learn things about the world that they would not have known otherwise.

The purpose of this chapter is to give you an accurate and honest understanding of what any trader is competing with when he puts on a position. You are going to need to understand what's out there. These are facts that the retail trading industry does not want you to know. There's an entire industry in place to help you trade and charge you for it. Some of this industry is legitimate and will help you become successful.

Unfortunately, most of these trading industry vendors are more interested in your money than your success. Your online broker spends fortunes on television and print advertising trying to convince you that you can single-handedly achieve your financial goals. All you need to do is open a brokerage account with their company and use their software tools, although their print copy and commercials are sufficiently filled with enough content to legally cover themselves when someone loses his shirt. Incidentally, their software has the same technical indicators that are publicly available on the Internet for free. There are a multitude of software companies that will sell you a technical trading system that claims to ensure that you will rule the markets, with seemingly no risk.

Meanwhile, getting back to reality, here's what the business actually is, and a very serious business it is. It's the ultimate game of mind versus minds. You're not up against one MIT graduate; you are competing with thousands of them. You can't see the other minds you are up against. You don't know who they are or what they look like. At least when a fighter steps into the ring, he's entitled to a good look at his opponent.

So before we dive into the enlightening world of volatility-based technical analysis, let's understand the most important challenges you face. The pages that follow will briefly discuss some very eye-opening truths about the markets, which you will likely find both fascinating and disturbing. Use the sections that follow to better understand what awaits you when you step into the trading pits, and keep in mind that there is a specific solution for each of these challenges. I identify the solutions in Chapter 2, and explore them in the body of this book.

THE BRAIN POWER

Today all traders, and that includes you, are competing with the best and the brightest minds that the world has to offer.

Perform an Internet search and look at a job advertisement for a trading development analyst at a large institutional trading firm. The job qualifications and educational requirements are lengthy. Every type of quantitative and financial modeling methodology imaginable is housed within these firms. Many of these firms have mathematical talent in-house that could rival NASA when the United States won the space race.

Large hedge funds, mutual funds, and investment banks are staffed with incredibly bright, well-educated, and highly paid individuals. These are typically quantitative analysts and computer programmers with an aptitude for finding a single needle in five hundred haystacks. Suffice it to say these people are not paid to play with trend lines and Fibonacci grids. They use advanced quantitative methods to find inefficiencies in the markets, and develop trading strategies to capture them. They have access to the finest software programs and enormous computing power. They work with ultra-high-speed data that go way beyond high-low-open-close and volume. Market declines and financial industry layoffs have not reduced the effects of these individuals. Periods of ultra-high market volatility conveniently provide data, which enable them to more finely hone program trading algorithms.

Here are a couple of sample job requirements for the talent behind the trading strategies that are created inside the institutional firms with which all traders are competing:

Senior Quantitative Analyst—Salary/Rate: 300K+

Essential skills, experience, and qualifications:

- Two to four years of relevant quantitative research, or trading experience.
- PhD or equivalent degree in Math, Financial Mathematics, Physics, Engineering, or Computer Science.
- Very strong analytical, mathematical, and problem solving capabilities.
- Excellence in probability theory, stochastic processes, statistics, partial differential equations, and numerical analysis.

Experience in any of the following:

- Interest rate derivatives modeling.
- FOREX modeling.
- Credit derivatives modeling.
- Commodity modeling and research.
- Grasp of PDEs and Monte Carlo.
- Very good understanding of quantitative models for pricing and hedging derivatives.
- Outstanding C/C++ programming skills.

Statistical Arbitrage Quantitative Analyst / $120K+

New York, United Kingdom
Quantitative Analyst with sound skills in statistical arbitrage needed
Requirements:

- Honors degree followed by a post-doctorate degree in mathematics, finance, statistics, or similar.
- Knowledge of SAS or other statistical packages.
- C++/MATLAB and VBA along with strong quantitative skills.
- Experience in implementation of quantitative trading systems.
- Experience in high frequency algorithmic trading, P&L, and various other quantitative tasks.

Do you think you're smart now? That increase in sales you achieved last year at your job was a pretty good feat. The way you opened that new location in an up-and-coming part of town before your competitor did was a real accomplishment. The promotion you received this year was a genuine triumph over your peers. Now imagine what you could have done if you had had at your disposal a team of rocket scientists such as those just described. Just as important, suppose your competitors had access to that team of geniuses last year and you did not. Would you still have that promotion, sales increase, or competitive advantage?

Here's the question that is just screaming for an answer: Does anyone think an institutional trading firm would spend a couple of million dollars annually paying a team of Ph.D. graduates to perform technical analysis using publicly available technical indicators?

It's almost comical to imagine a room full of MIT graduates staring at computer screens, drawing trend lines and Fibonacci grids, and sending buy recommendations to the traders based on a stochastic oversold indicator. It's like something out a Far Side comic frame.

THE HORSE POWER

Institutional market participants with deep pockets have a technological infrastructure advantage.

Try to buy some of the advanced analytical software and data feeds that institutional trading firms use. You would not be able to justify the cost because you're not in the club: the billion-dollar institutional investment business. You don't manage a three-billion dollar fund. I believe you have just as much right, however, to eat steak in first class as the club members do. You will be able to see how in the chapters to come.

Inside these institutional firms real-time super computer systems run 24/7, monitoring price and volume movements, implied volatility levels, trading pairs and correlations, foreign exchange rates, right down to the tick, on every tradable financial security and instrument. The software they are executing is created by the sum of the mathematical brainpower of the most amazingly sharp minds in the entire world. As has been shown, these minds are highly paid; nothing less than six figures!

Vendors such as Thomson Reuters provide international market data feeds that propagate data into high speed databases that drive programmed trading execution. For

example, their FasTick analytics suite can capture, sort, and archive 100,000 tick transactions per second in real time. These data are then used instantaneously by quantitative trading algorithms. This same vendor connects the institutional client directly to the trading exchange by T3 communication lines for automated order execution. This is a process that measures its end-to-end performance in milliseconds.

All captured tick data are routinely used to adapt and update the algorithmic trading models as markets change. For instance, the seamless integration of these tick databases with the MathWorks MATLAB application enables the quantitative analyst to model accumulation and distribution strategies quickly. The strategies are then executed by automated algorithms over increasingly shorter periods of time; days instead of weeks. This is largely responsible for the erosion of chart pattern effectiveness. These strategies are preempting their formation behavior, and post-formation behavior through recognition of the opportunities in advance of most market participants. Price action that previously signaled demand is vanishing because of arbitrage strategies and hyper-efficient programmed trading.

Do you like to trade news releases? You might want to think again. Thomson Reuters and Bloomberg offer high speed news feeds. Everyone knows that, but did you know this: Thomson Reuters, for instance, offers a software product called NewScope, which reformats the electronic news document with meta tags, which are codes that a computer program understands. It processes the document in less than 300 milliseconds; that's one third of a second.

The meta tags mark and specifically classify the pertinent facts and figures in the document so that an automated trading program can quantify that new story's effect on specific asset classes. Targeted securities are then bought or sold in real time, based on the algorithm's logic. These trading algorithms are created by those bright MIT-level graduates discussed in the previous section. This automated trading of news events happens without human intervention. Using this methodology, trades in response to news events are routinely executed within one to three seconds. Before the private trader even thinks about the news event, bid and ask spreads on actionable securities are widened and price has begun to move. By the time the individual trader is buying in response to the news event, the automated algorithm is selling and booking profit.

This is computer logic that never sleeps, does not go on vacation, and is not subject to fear, greed, or other emotions. It has access to data that aggressive individual traders can often only dream of. Don't make the mistake of trying to beat it at its own game. A butter knife will not help you much in a gun fight.

OPTIONS AND VaR ASCENDANCY

Current technical analysis leaves the individual and private trader ill-prepared to participate in today's markets because it does not adequately utilize volatility measurement.

Are you basing your technical analysis methods on the correct underlying dynamics? Or, more importantly perhaps, the question should be, why is such intense talent needed in-house at large institutional firms? These two questions are linked in a most important way. The answer to them both is simple yet subtle. Trading has changed, but no one bothered to tell the private trader-investor about it.

Trading is no longer just buying and selling of stocks. Today, the major influencers of stock prices are options trading, and the effects of Value-at-Risk (VaR) on modern portfolio theory. We look at options trading first. A careful historical examination of this volume and type of trading brings to light the forces causing this underlying market-moving shift.

Figures 1.1 and 1.2 together illustrate the tale of the equity trading metamorphosis. Here are the underlying causes for this dramatic fundamental market change:

- Although options have been traded since the early 1970s, the markets in recent years are experiencing a large divergence in the volume of options trading relative to direct buying and selling of stocks.
- Figure 1.1 shows that the Dow Jones Industrial Average has achieved significant price gains between 2002 and 2007. Its actual equity trading volume, however, has remained flat year over year. Taken alone, this is an illogical divergence.
- By contrast, Figure 1.2 shows clearly that between 2002 and 2007 the U.S. total equity options contract volume has increased by almost 200 percent.
- These data imply clearly that larger market-moving institutional players are executing their strategies with a heavier reliance on options than on direct equity trading. Option valuation is now a primary underlying influence of supply and demand in equity trading. Note that not all stock indexes show as dramatic a change in equity trading volume as the Dow Jones Industrial Average does. However, it is clear that indexes more heavily comprised of option capable stocks reflect this trend most.

This incredible shift to options trading has been largely attributed to the rise in the number of hedge funds, since, not coincidentally, the year 2000. The amount of assets under management at hedge funds grew from $300 billion in the year 2002 to more than $2 trillion in 2007.[1] An increased reliance on leverage, and the use of complex hedging strategies, have caused options to be the market's primary instrument of choice.

The reason all this is important is that options pricing and valuation is based on volatility. Determining the probability of what a stock's price may reach, higher or lower, within an ever-decreasing time window is almost entirely based on volatility. Of even greater importance is that technical analysis as it exists today rarely uses volatility in its algorithms. Rather, current technical analysis commonly available to retail traders is based on calculations of linear price movements and two-dimensional data. It depends heavily on chart pattern analysis and fixed pricing levels of support and resistance. In short, classic technical analysis delivers what the eye can see on the chart, while what is needed is only that which the microprocessor can see.

The other massive influence of volatility on stock price movement is the current use

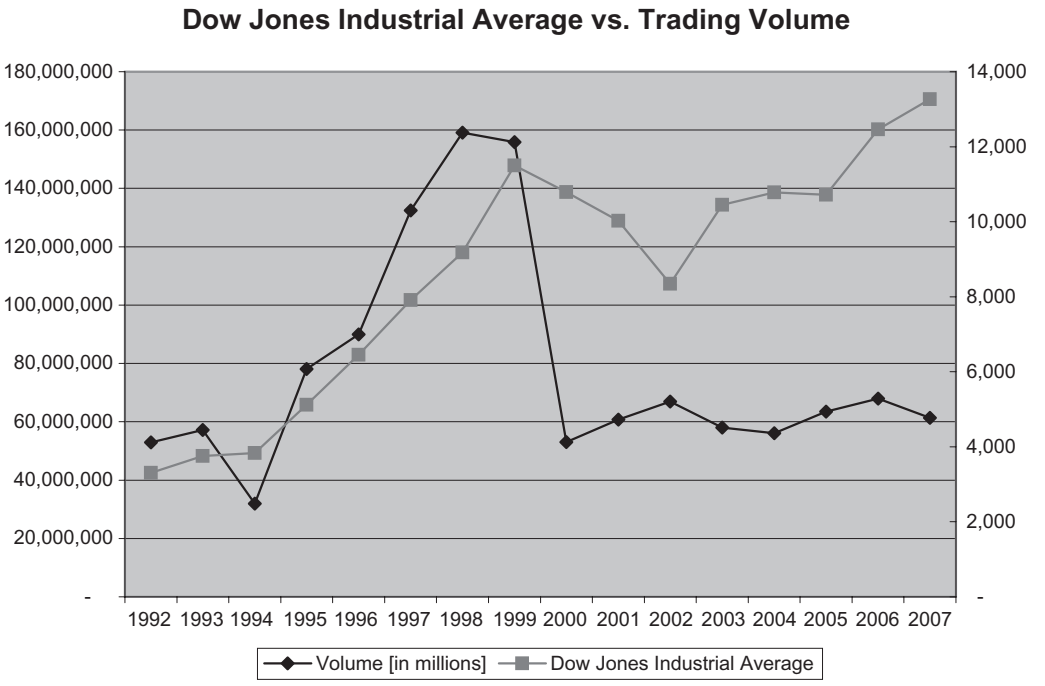

FIGURE 1.1 In the first decade of the twentieth century, the Dow Jones Industrial Average achieved significant price gains, while direct trading of its individual equity components experienced negative volume growth.

Data source: Reuters QuoteCenter.

FIGURE 1.2 By contrast, total equity options trading has increased by almost 200 percent since the year 2002.

Data source: Chicago Board Options Exchange, 2007 Market Statistics Report.

of Value-at-Risk (VaR) modeling on modern portfolio theory (MPT). Most stock is owned by large institutions: mutual funds, hedge funds, endowments, sovereign wealth funds, and so forth. These organizations balance and diversify their stock portfolios based on VaR calculations. VaR, first developed by J. P. Morgan in 1994, is primarily a risk-modeling methodology based primarily on, you guessed it, volatility. It therefore forces volatility measurement to be a primary driver of the institutional accumulation and distribution of specific equities.

Volatility in the world of finance is usually expressed as the standard deviation of the change in value of a financial instrument with a specific time horizon. Its largest use is that of option premium pricing and quantification of risk. Volatility in its two distinctly different forms, historical and implied, are the primary inputs for determining a stock option's premium price. Simply put, volatility measurement is the key input that determines equity valuation, through the underlying stock's option pricing. The subject of volatility is quite deep and is one of the most misunderstood financial measurements.

Here's the answer, though, to why there is the need for expensive rocket science talent at large institutional trading firms, mutual funds, investment banks, and hedge funds. Volatility analysis requires the higher use of mathematics. Only quantitative mathematicians can really work in-depth with it, and to its highest degree.

In the chapters to come you will learn ways that the private trader, without advanced degrees, can work with and analyze stock volatility using today's programmable technical analysis software. There are other methods to measure it that don't require quantitative mathematics. It's one of the most important disciplines that will make you successful. Once you become an opportunist of volatility measurement, instead of a casualty of it, you will be able to see and capture market inefficiencies that were previously invisible to you.

Here is a sneak peak at how you can have volatility-based technical analysis work for you. Figure 1.3 shows us a weekly chart of Cephalon Incorporated (CEPH). The chart time span is 2007 to 2008, which was a very difficult and volatile market environment. The upper and lower trading bands are based purely on volatility measurement. Their peaks and troughs project forward key levels of support and resistance, which are shown on the chart as dashed horizontal lines. You will learn more about these technical components in the chapters to come.

The circled areas on the chart show how these volatility-based levels of support and resistance were instrumental in causing price to reverse or pause. The lines are usually determined weeks in advance and exist in most time frames. The foreknowledge of these support and resistance levels, and the best practices of their use, can be a vital part of the edge that you need to overcome the challenges faced by individual traders. This is a clear advantage of volatility-based technical analysis.

RAIN CLOUDS OR URINE?

The individual retail trader is largely unprepared to trade, but is swayed to believe just the opposite by an industry that seeks mostly the contents of the trader's wallet.