



# KIRKPATRICK'S INVESTMENT AND TRADING STRATEGIES

TOOLS AND TECHNIQUES  
FOR PROFITABLE TREND FOLLOWING

CHARLES D. KIRKPATRICK II, CMT

## Praise for *Kirkpatrick's Investment and Trading Strategies*

"Charles Kirkpatrick has been producing top-notch work for years, as evidenced by his multiple Dow Awards and top-rated books. And his work keeps getting better. He doesn't just hypothesize about market movements. He backs up his ideas with real, quantified data. This book is another very impressive addition to the Charles Kirkpatrick library of work. Well done!"

—**Rob Hanna**, founder of QuantifiableEdges.com and OvernightEdges.com

"Kirkpatrick's latest work is a great companion to his book *Beat the Market: Invest by Knowing What Stocks to Buy and What Stocks to Sell*. He walks the reader step by step through his logic and then demonstrates the results by statistically valid test procedures. This is the Kirkpatrick Investment Theory updated and proven, plus a few extra studies to improve performance once again.

"For those of us who use his approach regularly, his latest work will improve and confirm his investment concepts. For those not familiar with his work, this book may inspire them to rethink what methods they are using. The backtested results are that impressive.

"Kirkpatrick's latest work addresses two significant areas. First, his investment approach is reviewed, tested, and refinements applied; then it is retested using walk forward techniques. The other area covered, and one that should not be overlooked, is his testing techniques and theories on how to evaluate stock selection and portfolio changes. He shows the reader how to focus on significant parameters that are most important while trying to avoid the dangers of optimization. The result is a robust system with a high probability of excellent performance in the future."

—**Thomas Hamilton**, President of Special Risk Capital Management, LLC

"When someone has been successfully involved in the markets and in particular technical analysis for almost half a century, you should pay attention to what he has to say. Charlie Kirkpatrick is such a person, one who has a solid grasp of how markets work and how to develop a process for profiting in them. I cannot begin to count the number of times I have read about someone's system and found that it was poorly designed, inadequately tested, and in many cases, used for some other motive than to provide a systematic approach to profiting in the market. Charlie has conquered all of these shortcomings in this book with a solid, well-constructed, thoroughly documented, and viable approach to systematic trading."

—**Gregory L. Morris**, author of *Dancing with the Trend*,  
Chairman of Investment Committee, and Chief Technical  
Analyst of Stadion Money Management, LLC

“On the Venn diagram of financial market study, this book fits into the coveted overlap between technical, quantitative, and fundamental approaches. It addresses one of the key questions that all three methods ask: How can the relative performance of stocks to one another be used to create a profitable investing approach? Kirkpatrick walks the reader through the necessary elements to comprehend and build robust market timing and stock selection systems. He addresses the murky issues of optimization and quantifying trend and also focuses in on his preferred indicators and uses for cycle analysis, based on 40+ years of market experience. No fancy software required—Kirkpatrick presents systems that can be implemented and managed using the most basic of tools. A great read for anyone looking to approach the markets more systematically, making the most of their capital and time.”

**Hima Reddy, CMT**, author of *The Trading Methodologies of W.D. Gann*

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Tools and Techniques for Profitable  
Trend Following

Charles D. Kirkpatrick II, CMT

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*To James C. Boyd,  
who was with me in the beginning.*

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Kittery, Maine  
May 19, 2013

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# Preface

I find I am most challenged by the ocean and the trading markets. I respect them because they are both such a challenge to outwit. Both have similarities. The ocean can be beautiful, but it also can be deadly. Same with the market: It can be deadly or calm. The other similar aspect is that neither gives a damn about me or anyone else. They are individual forces that have strength beyond our mortal powers. Often they are personalized, as “mother nature” or “Mr. Market,” but they are not personal. They are physically apparent but operate with complete indifference to us and others. Indeed, the challenge in interacting with them is that of learning when they are friendly and when they are not. We make our profits in friendly markets, and we sail comfortably and safely when the ocean is friendly. The most important point about both is that we can try to understand when circumstances are favorable for us, but we will never understand the entire picture of the oceans or the markets. So our endeavor is to discover how to anticipate the friendliness of both, when to invest and when not, and when to sail and when not. We make mistakes because the markets and oceans can rapidly change character, or we make mistakes because our analysis is wrong. It is a frustrating exercise but one filled with thrills, joy, sadness, fear, greed, and sometimes accomplishment. These are our personal emotions, not those of the indifferent markets or ocean. Thus, we tend to make many mistakes by being emotional in an unsympathetic world. We learn that to take advantage of the friendly times, we must be equally as unsympathetic, be critical of our decisions and our mistakes, not blame the inanimate world for our inadequacies, and must utilize only those strategies that come from pure, unemotional reason.

## Introduction

I write this book to describe and test the concepts I use in my favorite investment and trading strategies. These concepts are not new by themselves but are newly applied to these strategies and should become the basis for the honest study of all stock-picking methods. I use the walk-forward method of optimizing all strategies as this is to me the best and most realistic means of testing and analyzing an algorithmic system. More about the specifics of these concepts and how they work follows in the succeeding chapters as I progress through the particulars of these systems. I explain what I believe to be the only way that the uninformed, disconnected, otherwise busy, time-limited, poorly financed, stock market outsider can still compete with the “big boys.”

## **Discretionary Versus Algorithmic Trading or Investing**

*Discretionary investing* occurs when all decisions are made by the investor. Success is rare and depends on knowledge, expertise, quick decision making, and the ability to master emotions, biases, and mood. Most people lose money in investing because they act on rumor, advice, intuition, hunch, incorrect information, poor judgment, or any number of other inputs into their investment decisions. There are very successful discretionary investors, such as Warren Buffett, George Soros, Paul Tudor Jones, and T. Boone Pickens. You

and I are not in this class. We need help and discipline as well as the ability to determine when to buy and sell. The psyche of these billionaires is hard-wired to select and to time investments. Most people are lacking in this ability; that is why they consistently lose money and are forced out of the markets with losses. Even many so-called professionals are unable to invest successfully. The poor performance of most professionally run mutual funds and pension funds demonstrates this universal shortcoming. So how do you and I survive in the trading markets when we don't have intrinsic discretionary investment ability?

The answer has been around for many years but only recently available in an easily applicable form. Robert Pardo (2008)<sup>1</sup> argues, and I tend to agree, that two events have occurred in markets in the past 20 years that can help the outsider. One is the expansion of markets to include financial derivatives. Financial derivatives, those financial instruments that derive their value from another security, provide hedging and speculation in large, liquid markets that only recently have become available to the average investor. Second, Pardo argues, is the availability of cheap, fast computing power. None of the data testing done in this book would have been available to you or me 20 years ago. The ability to rapidly calculate large amounts of data has made it possible to test theories of investment that had long been simply passed down from trader to trader, investor to investor. I add a third event to the list: the ability to execute a buy or sell order inexpensively, efficiently, and rapidly. Electronic exchanges have changed the entire investment field: The old, stodgy investment manager calling his broker to execute an order is an event of the distant past.

These character changes in the markets and speedier ancillary facilities have made it possible to develop investment systems that can be proven statistically and operated almost mechanically. These systems are called *algorithmic systems* because they are nondiscretionary and operate solely on an algorithm or series of algorithms invented for the specific purpose of profiting in the marketplace. By

using proven mechanical strategies that don't require the expertise and knowledge of successful discretionary investors, algorithms circumvent the intrinsic human inability to profit in the markets.

However, algorithmic trading requires strict sets of well-defined rules. Even when a system is tested and perfected, the investor can still become discouraged, bored, unhappy with the immediate results, or bothered by drawdowns to such a point that he will abandon the successful system and thus lose whatever advantage he had derived from it. This is human nature, a nature not compatible with trading markets. Therefore, even though an algorithmic system can be developed, optimized, and tested in multiple ways, the user still has the impulse to abandon it. So, to be successful in algorithmic systems, not only must the investor or trader spend time and mental power to develop and test the system, but he must also have the willpower, discipline, and patience not to waver from it.

This book demonstrates and explains algorithmic systems for both investment and for trading. It uses specific rules to enter and exit individual stocks. These rules are derived from statistical methods of optimization that give a better-than-even chance of success, a definite edge, in the marketplace. No system is perfect or without losses, of course, but these limitations are understood and have been taken into consideration and study. The final algorithms in this book are as accurate and profitable as possible under present methods of back-testing. Ask yourself if your personal method has produced the same performance results as these systems. If it has, then you are in the same exalted league as the masters I mentioned previously, and you can throw this book away.

## **Why This Book?**

I write this book because I am disheartened by the general lack of investment common sense and because it hurts me that so much

money has been lost when it could easily have been kept. As one who has practiced on Wall Street for more than 47 years, has taught technical analysis at the graduate-school level, and has been awarded many honors by my peers, I describe in this book, point-by-point, the best investment methods for profitable investing and trading stock trends I have found over a lifetime of professional study. People often ask me about the stock market, with questions such as the following:

- “I have lost a lot of money in the stock market. Should I quit and just buy mutual funds, ETFs, or government bonds?”
- “What should I do?”
- “How do I compete with the professionals in selecting stocks?”
- “How do I know when it is time to sell?”

This book examines in detail an investment system of stock selection for investors and several indicators as well as a system for traders. As in any serious pursuit, it takes some work by the participant, but once the system is set up, the work should take an hour each week at most. It may require a subscription to a data service or charting service, though many are now free on the Internet. I also include several trading systems that are short-term and use hourly price data. They require more work, more information, more time, better execution of trades, and the ability to sell short.

The meat of this book is described in easily understood terms for anyone familiar with the technical aspects of the stock market. Not one to just describe what to do, I test with modern statistical tests to show the best combination of indicators to use. The results of these tests fully demonstrate how you can successfully apply them.

Recent times in the stock market have been difficult for amateur and professional alike. Investors have been burned in the stock market and are distrustful of “methods” or “systems.” They are also skeptical of new books on investment methods, suspecting that those methods are suppositions or unsubstantiated promises by the author

to sell books or an advisory service. This book is different, as are my previous books, because I actually test the methods I describe. Very few books do this, and those that do often suffer from flawed techniques. I test methods because I want readers to understand that these work. This book is not, however, a treatise on the follies of conventional investment analysis. Instead, it is a book that describes the logic and particulars of how to invest and trade successfully in stocks using statistically demonstrated systems.

I often use the term *system*. As a term, it may have negative connotations in other endeavors, but in the context of investing and trading, a system is a set of rules for buying and selling that is uninhibited by discretionary decisions and has been backtested for verity and robustness (that is, stability). Usually, systems are technical, in that they only utilize prices and configurations of trading statistics, but not always. Many successful systems use fundamental, economic data, or a combination of both fundamental and technical. The O’Neil CANSLIM method, for example, is a combined system as is the value line method of ranking stocks. When a system is purely technical, however, it may turn off people who don’t believe in technical analysis.

During the time I worked as an institutional salesman, I met many institutional investment managers who did not trust technical analysis. Because of this, they mistrusted the relative strength method I was selling, continuing to do so even after I had demonstrated its success in real time with their own portfolio and investment lists. The managers seemed to reject technical analysis based on advice they had heard from contemporary managers and courses they had taken at their business schools. It was at that time I decided to focus on teaching and introducing technical analysis to business school curricula where most of these portfolio managers had gained their misinformation and bias against technical analysis. This book uses a few technical indicators, those that I have found to be excellent when used properly. I describe them and their use in detail, as well as test their validity in selecting and discarding stocks.



## Investing Is a Business

People tend to treat investment as a specialty having to do with picking the right investments and selling them when they become successful. However, investment is a business, just like a hardware store, where items are bought with the intention of selling them at higher prices than what was paid for them and liquidating those items that don't sell well. It is an inventory management business where losers are eliminated and winners are accumulated. Unfortunately, the investment management business doesn't quite look at investments this way. For one, portfolio managers and investors are reticent to sell investments at a loss. There is a documented and well-studied psychological fear of admitting failure in the markets. But does the hardware store manager castigate himself for dumping goods that don't sell? Perhaps a little, but the successful manager dumps them in a sale, hopes to break even, and expands the products that are profitable. In other words, the manager's ego, while dented slightly, doesn't interfere with the successful business of selling hardware goods. On the other hand, ego tends to run portfolios, rather than common sense. Not surprisingly, the hardware business and the markets don't care about ego. The market is neutral, dispassionate, nonjudgmental, and as some egotists anthropomorphize, "cruel." But to profit in the market, just as in a retail business, ego must be subordinate to reality. Reality is that the business or portfolio manager is not perfect nor is his decision making. The decision-making process depends on too many variables and facts that can be inaccurate, irrelevant, or that can change. It also depends on experience, knowledge, and discipline. Errors in judgment are common and must be rectified immediately, especially in trading. The law of percentages (50% loss requires a 100% gain to break even) is against the indecisive manager when an initial decision is incorrect.

## Strategies

Investment management consists of three basic strategies. Two have to do with the management of activity, buying and selling. The third is a strategy not covered in this book: how to manage portfolio risk called *money management*. In individual investments, a stock must be picked and then bought, the bought stocks must be sold at some time, and the whole process must be managed for risk. The first is called *entry strategy*; the second is called *exit strategy*. Exit strategy is also called *risk management*. The third strategy is *money management* or *portfolio management*. No investment program can succeed without all three. Unfortunately, most portfolio managers and investors focus on entry, and relegate exit and money management to the bottom of their priorities. Ironically, the reason most professional managers and investors consistently lose money is that the latter two are the more important.

In my graduate-school classes on technical analysis, I ask students to randomly pick a stock, regardless of its earnings, management, industry, and so forth and rather than analyze those particulars, invest on the flip of a coin. Using the price history of their chosen stock over the previous six months, they are to record the results of each transaction. At a coin flip of heads, the entry signal is to buy, and at a flip of tails to sell short. This is their entry strategy. Using an equal dollar amount of shares for each transaction so as not to be influenced by position size, they are to record holding the position until they exit their position on the exit rules. They are to close the position when either it has a 5% loss or it has retraced from its most profitable gain by 5%. In other words, if the student buys a stock at 100, he then either sells it at 95 (5% loss) or at a retracement of 5% from its most profitable price. Say the stock runs to 130 and then retraces 5% to 123.50. The position is then closed for a gain of 23.5%. In a short sale,

the procedure is the same only the risk is 5% above the short-sale price. This is their exit strategy. On the day after a position is closed, they are to start the process over again by flipping a coin and acting according to the original instructions.

Of course, in this simple system, it helps to have a volatile stock. Dull stock behavior won't produce many transactions and thus little profit. This, in itself, is a lesson on why volatility is a desirable facet of investment and especially trading, provided risk of loss is controlled, as it is in this experiment. Do all of the students make money? No, but a plurality do, enough so that if a portfolio were constructed of all the students' individual experiments, it would consistently make money. The lesson: Buying or short-selling a stock is not the most important aspect of investment—it was done on the flip of a coin. Selling and controlling risk are the most important and why an explicit exit strategy is necessary.

### ***Entry Strategy***

There are many excellent entry strategies, both fundamental and technical. Several recent books have described fundamental strategies using various corporate statistics and have given statistical evidence on their merits. The problem of selecting stocks has been well researched and is available in book form for anyone to learn.

In my earlier investment book, *Beat the Market*,<sup>2</sup> I demonstrated methods I found at the time to be the best for selecting stocks and for timing their purchase and sale. This system included a screening of all U.S. stocks for those that had the best recent history of price rise, called *relative strength*. I also used two screens of fundamental, company-specific information. These were relative earnings growth and relative price-to-sales. The 2006 study included figures going back to 1998. It was an evaluation of a system that had been operating live for nine years, but it was not an optimization for the best

parameters. I only looked at what had happened with predetermined parameters from the 1970s.

Until relatively recently, to prove the validity of a systematic method, analysts had to develop a hypothesis, perhaps backtest it, and calculate it each day and measure the results on paper for a long period to see if it actually worked. The process was similar to the scientific method of hypothesis, trial, and confirmation or rejection. Because my earlier study used weekly data only, the time necessary for conclusive results was long, often many years. I am getting older now and don't have the time ahead to do such tests again. Thankfully, the computer, easily accessible stock market price data, and new methods of backtesting have been developed and are being used by students of the markets today to investigate systems without waiting years for results.

The primary testing method I now use is called *walk-forward optimizing*. It optimizes segments of price data in the past; for each segment, it finds the best fit for a proposed system and tests it in data that is not part of the optimization. It duplicates as well as possible the earlier lengthy method of waiting for results. When properly constructed, it covers substantial periods of time in deriving the optimizations to represent all kinds of markets over time; it runs through a number of different sequences to ensure the results are not a "best fit" to existing data; and it uses a substantial amount of data, enough to include real-time anomalies in the tests. When it fails to show a robust system, the failure is useful because it shuts off further inquiry in the direction of that failure and often suggests other approaches that may be better. Once this optimization is completed and the results show a viable system is present, the probability of it working in the future is high. Of course, there is no guarantee that the system will prove to be viable in the future, but the odds are significantly increased by the use of out-of-sample testing within the optimization.

I know from past history, professional and academic literature, and from watching its success in live markets that there is validity to the relative price strength method, but when I began, I did not know the specific parameters that would be optimal. Earlier parameters had been somewhat arbitrarily derived years before the long-term test began. For example, Bob Levy, who originated the method in the late 1960s, suggested a lookback period for the calculation of relative strength of 26 weeks. He had tried periods of 4 weeks through 52 weeks, finding that 52 weeks worked but not as well as 26 weeks and that 4 weeks gave a negative performance. Thus, I used 26 weeks in the original formula and followed its use for more than 30 years. You will see later in this book, when I get to the actual tests of relative strength, that the optimal lookback is similar to what was hypothesized. I test not only the lookback period but also the ideal buy rank and sell rank, the minimum volume and price necessary to profit, and the percent protective stop. I assume that most investors and portfolio managers using relative strength as a stock selection method are interested only in taking investment positions. The emphasis in this book in the investment section is thus on holding long positions only. Short-selling is presented in the second section of this book on trading strategies beginning in Chapter 6, "Trading Strategies."

My earlier method of stock selection worked in historical testing for a few years. The relative earnings growth never worked, and the relative price-to-sales ratio never came close as a separate selection criteria to the success from relative price strength alone, but it did prove useful at market peaks. Since then, I've found that a relative price-to-sales screen is not fruitful, detracting from the performance of relatively strong stocks. I also found that the relative strength itself was not providing the spectacular results it had in the past. I knew from having watched these figures in real time for more than 30 years that there were periods when they didn't work, but I had to admit that I never investigated the best all-round parameters. I notice in O'Shaughnessy's fourth edition of his book *What Works on Wall*

*Street* (2012)<sup>3</sup> that he also has found that price-to-sales is no longer a highly rated selection means, yet he still maintains that relative price strength is the best selection method of all, though his calculation and lookback are quite different from mine. So I have eliminated price-to-sales and continue with just relative price strength, back to my roots as a technical analyst, a place where I feel more comfortable.

### ***Limiting Capital Loss—Drawdown, Volatility, and Diversification***

Most investment managers and portfolio managers don't have an explicit exit strategy and thus have no idea of what their potential capital risk may be. The next time you sit down with your investment manager or read literature on your mutual fund, look for evidence of an explicit exit strategy. You'll be surprised how vague is their coverage, if at all, of closing positions and limiting capital risk. As demonstrated in the student experiment, it is the limiting of the losses that provides the profit, not the stock picking. This is the same principle that the hardware store owner faces: Limit loss and hold profit.

There are many ways to limit loss, most of them technical, having to do with the price action of the security itself. It is very difficult to have an exit strategy based on earnings, sales, or any of the scores of fundamental factors that accompany a stock. O'Shaughnessy has experimented with fundamental factors that consistently cause losses or underperformance, but even his study avoids the question of when to sell a stock either to protect against loss or to protect against loss of accumulated gain. So technical analysis, the study of price action, is the primary method of protecting against loss and even more importantly is the primary method of determining risk of loss.

*Drawdown*, the amount by which a portfolio can decline from its highest value to its lowest value, is the best measure of risk. It quantifies the percentage and dollars at risk. Drawdown is the ultimate risk of capital. A 100% drawdown means you have been wiped out.

A lesser drawdown may be impossible for you to mentally and emotionally withstand. You should understand what you will accept as the largest loss and approach your investments with that in mind. Most investors are willing to accept a loss of as much as 20% in a drawdown, provided the upside performance potential is two to three times better. The relationship between acceptable gains versus drawdown is personal. Some commodity speculators are willing to take 60% to 80% drawdowns, but they know their system will eventually double or triple their investment. It is a standard rule that gains and drawdowns are related and that you cannot have substantial gains without being able to accept sizable drawdowns.

*Volatility* is a measure of how much a price oscillates back and forth. It is never a constant, as volatility changes with market conditions and the stock's trend. It also doesn't tell you what your dollar or percentage capital risk might be. Volatility should never be the primary gauge of risk. Whereas drawdown is forever, volatility as a risk measure is limited. No volatility value can tell you that you will be wiped out. Unbelievably, recent academic and professional literature focuses on volatility as something to avoid. Yet, volatility is where profits are made and is thus something to seek. Loss comes from drawdown, not volatility. In my student exercise, it was the curtailing of loss through the 5% protective exit, limiting my drawdown to 5%, that allowed the upward volatility to profit. The drawdown was controlled with the 5% limit. Measures like the Sharpe ratio, a common measure of risk, that contain a divisor based on volatility are deceiving because they include both up and down volatility. An investment should always have a large upward volatility—you can't profit from a dull stock—and have a limit on its downside volatility.

Sharpe ratio figures are incorrectly presented as measures of risk. Because of the universality of this misconception, portfolio managers in most firms have to include their Sharpe ratio in reports of their performance to show risk. This convention is also seen in most mutual fund monitoring services and most literature from mutual fund

companies. This public display of volatility as a measure of risk forces portfolio managers, who must compete in the performance world, to buy stocks with lower-than-average volatility so as to keep their risk low. They thus are forced to buy stocks that are not trending, yet what is necessary for substantial profit with limited capital risk is a strong, steeply rising, volatile stock price, a price-related method of selling to protect against initial loss in case the investment turns out to be a poor one, and a price-related method of selling to avoid losing a majority of the gain from a successful one.

Volatility calculated as the standard deviation of prices is also a false volatility yet it is included in the Black-Scholes option pricing model. When a security is in an upward trend, where the price is rapidly advancing, standard deviation includes the strength of the trend as well as variability around it. In other words, a rising stock will have a high standard deviation because by being in a trend, the price deviates significantly from its mean. If such a calculation of volatility is used as a measure of risk, it thus excludes a strong stock from investment consideration because a strong stock is by this definition very risky. This is nonsense. The many professional and academic studies of the relative strength concept prove that price strength is profitable. Indeed, upside volatility is desirable, not something to fear. It is the risk of capital loss, something totally different, that is worrisome. I don't know if the prejudice about technical analysis is the cause of this misapplication of volatility as a concept or not, but it is unrealistic and has led to many portfolio disasters.

Another misconception is that *diversification* is the solution to avoid poor stock selection. It assumes that the investment decision will be wrong sometimes, but that if enough stocks are owned, the total loss will be dampened by the success of the profitable stocks. This philosophy is a misplaced result of the Capital Asset Pricing Model principally because it relies on what is called "beta" as a risk measure. Beta is a measure of how closely a stock's price changes mimic the changes in a market average such as the Standard & Poor's



500. When the linear relationship between a stock price change and a market average change is plotted on a graph, the point at which the line crosses the vertical axis is called the alpha, and the slope of the line is called the beta. A steep slope, and thus a high beta, is considered to be a sign of high volatility. However, while being represented as a measure of risk, it tells nothing about the chances of capital loss in the stock. All beta does is measure the oscillations of the stock relative to a market average. It tells me nothing about whether I will lose money. In fact, the alpha is a better measure of a risky stock; a negative alpha, regardless of its volatility, suggests that the stock is performing worse than the market average. I will lose money on a poor-performing stock with a low alpha regardless of what level exists for its beta.

Diversification is also less than optimal for substantial profit. Diversification may lessen the effect of a losing position, but it also lessens the effect of a winning position. It's the "chicken" way of avoiding investment mistakes and avoiding the use of a tested, robust investment system. In a portfolio, because it is a business, meritocracy must rule. A portfolio should be filled with the strongest, most volatile stocks possible. If the oil stocks are the strongest, the portfolio should own nothing but oil stocks. If the oil and ditch-digging stocks are the strongest and most volatile, the only diversification should be in those two sectors. The purpose in portfolio management is to make money, not be average or equal to other portfolios. Risk should be controlled by risk management, not by diversification. In the market decline between 2007 and 2009, all stocks declined. Diversification was a useless method of controlling capital loss.

### ***Exit Strategy***

Exit strategies are risk-avoidance strategies. They are compiled to protect against capital loss or to lock in profits. Protecting against loss can be difficult. The standard method is to implement a *protective*

*stop* underneath the entry price to protect against a large loss in case the entry decision was incorrect. This may protect a position against a single loss, but it doesn't protect against a string of losses, nor does it protect against a large drawdown due to poor portfolio management. A string of losses may result from a poor selection method or from a general market decline. Poor selection can be reduced through proper position sizing (never putting too much money at risk in any specific position) or by market timing when a broad signal on the market suggests stepping completely away from the market for a while.

Market timing is a problem that investment managers do not like to face. When market timing signals that it is time to sell stocks, because the majority of investors are optimistic about the markets, and their customers are members of the public, the pressure is heavy on the manager not to act on the market timing signal. These customers often pull their money out of a fund that is selling when the market is high and reduce the management fee on the assets being managed. At that time, the fund's sales department exerts pressure on the manager to keep the customers happy by remaining in the market even when professionally it is obvious the market is in trouble. Most funds don't allow market timing at all in their charter, thus forcing the manager into taking his lumps when the market declines. This conflict between the portfolio managers and sales department and customers also occurs at market bottoms as well when customers don't want to own stock at all, yet the opportunity exists for a large market rise. The relationship between bullish and bearish sentiment in the market and the market's future direction is an entire study of its own, but the rule of thumb is that when the public is overly optimistic, the market is at a top, and, conversely, when the public is overly pessimistic, the market is at a bottom. Public pressure from news, investor comments, TV, advisors, and other outside sources to conform to existing public opinion make a market timing signal very difficult to follow. It is one reason why superior results come from a disciplined algorithmic

system that has proven to work in both types of markets and needs no emotional input.

Although the use of *price targets* is an exit strategy, I've not found any means of accurately projecting a price target. What I have found is that a price target can be deceiving. Invariably, either the price will fall short of the target, leaving the dilemma of when to sell, or it will exceed the target price by such a substantial amount that I feel foolish in having sold it so early. I don't believe in using price targets except as a technique for gauging the strength of a trend. This method is explained in Chapter 8, "Cycles and the Forward Line."

### ***Money Management Strategy***

This book is about proper investment and trading involving an entry strategy and an exit strategy. I highlight the best strategy that I have found and show how it has worked in the past and will likely work in the future. Money management strategy—how to organize a portfolio to reduce portfolio drawdown, as opposed to individual stock drawdown—is another subject, one I don't touch. I avoid it because it is complicated and deeply personal. What should the initial capital be, what should the trade size in shares or dollars be, should the strategy be combined with others and to what degree, what should the risk strategies and execution style be, what should the number of positions be, should leverage be used, and so on are all factors that should be addressed, though this is rarely done by portfolio managers and investors. I suggest that when you reach this stage in your investments study, you consult one of the excellent books on the subject. Don't be fooled by the constant use of the term *trader* in these books. The principles apply to any size portfolio, and most managers of large portfolios, being unaware of them, have difficulty in understanding why they consistently underperform the markets.

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Vince, Ralph. *Risk-Opportunity Analysis*. CreateSpace Independent Publishing Platform, 2012.

## Backtesting—Standard and Walk-Forward Optimization

The results in this book are from standard and walk-forward optimizations I performed at the end of the year 2012. The data is

the daily closing price of all U.S. common stocks traded from 1990 through 2012. The data includes listed and delisted stocks during that period, to eliminate survivor bias, but is limited to operating companies. The numerous derivative issues such as Exchange Traded Funds (ETFs) and other interest-rate related stocks are excluded. (ETFs are used in the trading section beginning in Chapter 6.) The total number of stocks analyzed is 6,272. The list also includes American Depositary Receipts (for stocks traded in foreign stock markets) and other forms of foreign stock replications that are listed in each of the three principal exchanges: the New York Stock Exchange, the American Stock Exchange, and the NASDAQ exchange. Price data is adjusted for splits and capital distributions but not for dividend payments. I use only price in this system because, as technicians have long argued, price includes every aspect of a stock's value, its history, its emotional appeal, and its place in the world as of each trade.

### ***Standard Optimization***

A *standard optimization* tests results from many variable parameters (such as lookback period in relative strength, rank to buy, and rank to sell) to see which combination gives the “best” answer. The best answer is subject to the preference of the analyst and is usually a combination of profit and potential loss. The final objective, called the *objective function*, is the statistic by which each test is measured. The highest level of objective function is the best answer. For example, suppose I use net profit as the objective function. As the computer runs through the various parameter combinations, it will arrive at a “best” set of parameters that gives the highest net profit of all the systems. This would then be the best system based on net profit as an objective function. Of course, net profit alone doesn't account for risk. The MAR ratio then could become the objective function. This is a ratio between compounded annual growth rate percentage (CAGR) and maximum drawdown percentage (MDD). The series of

tests for optimal parameters can then select the combination that had the highest MAR ratio. There are many other objective functions that can be used depending on the result that is important to the analyst.

### ***Walk-Forward Optimization***

In a walk-forward optimization, the optimization process is similar to the standard method in that it also uses an objective function by which the results of each optimization are measured. It is different, however, in that it optimizes over shorter periods called “runs” within the entire data series and then tests the parameters found to be the best in the short period on a selected portion of the data that is independent and thus “unknown” to the optimization data. It summarizes these “out of sample (OOS)” results to see how well the best combinations from the original data worked in the unknown data. A successful result is a return in the unknown data similar to the return in the known data. In the walk-forward optimization the number of runs is varied to be sure no pattern has been present between time periods, and the percentage of out-of-sample data used in the tests is varied to be sure that the results summarize both long and short periods subsequent to the optimizations. The process of optimizing and testing results in unknown data is thus to see if the original system hypothesis has merit. One that has a high percentage of favorable test results is called “robust.” It has a high chance of continuing to profit in the future.

## **Book Organization**

Now that you have made it through the introduction, this book becomes more specific with its tests of the relative strength investment system and several trading systems. Each of the following chapters explains the concept of the study starting with what backtesting

and methods I use, followed by the results and graphs of the studies themselves. In the investment section, the results include the best lookback period for relative price strength, the rank or ratio for portfolio addition or deletion, the minimum volume and price for an initial trade, and the percent stop that produces the best results in tests with data unknown to the study. I then cover derived relative strength system rules and modify them with a market-timing system to reduce the effects of a market decline. The final results are practical, robust stock picking investment systems and technical trading systems that should not tax the abilities of the individual investor and can be applied to any size portfolio.

## Endnotes

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