Prologue: Where to Begin

Let's begin with the markets themselves, and with fear and greed. We have all heard the cliches about fear and greed. They rule the markets. In fact, that's all the markets are—a reflection of these emotions. In order to make money trading, you must learn to control your fear and greed.

Overcoming Fear and Greed

We all have to deal with our runaway emotions at various times in life, and these emotions *really* begin to run away when we trade. Bill Williams[1] used to say in his seminars that trading was the clearest window into your own personal psychology, clearer than any other endeavor. I think he was right.

UNDERSTANDING THE MARKETS

We give in to our fear when we don't take the next trade because we've just been through a string of losers and fear losing again. We give in to our fear when we put our stop loss too close and get stopped out of a trade without giving the trade enough room to develop. We give in to our fear when we freeze as a trade starts to lose money, and we don't take the exit signal because we're afraid of losing money.

We give in to our greed when we take a profit early, before the regular signal, because we don't want to give back any of the profits. We give in to our greed when we trade more contracts or shares than we normally would because we feel good about this trade.

So we start with the question, "How can we understand the markets?" If we understand how they work, we can get a better understanding of ourselves, and in turn be better traders.

Controlling greed takes discipline. As far as fear, Peter Steidlmayer[2] explained in his work with Market Profile that markets exist for one purpose and one purpose only—they exist to facilitate trade. Facilitating trade means that the markets will do anything they can to get individuals to participate in the market. How they do this is through movement. Markets move up and down searching for buyers and sellers.

The crucial point here is that markets must move for their survival. Understanding this literally changed the way I thought about the markets. Think about it. Markets have to move! This concept is major for anyone who has had to sit through a trend-following strategy trading in a sideways market. The knowledge that the market has to move eventually changes the way you look at trading. It gives you confidence that the string of losses can't continue indefinitely. It eliminates the fear!

You see, Steidlmayer explained that if a market does not facilitate trade, it will die. If it does not continue to bring traders in, to lure the buyers and sellers, the market will cease to exist. And the prime directive of a market is survival. To keep traders interested, the market has to move. It cannot remain in a small trading range or traders will lose money, become disinterested and leave. Eventually there will be less and less liquidity, traders will stop trading, and the market will die.

Knowing that a market must facilitate trade and move, or else die, has given me great confidence in trading. When I am forced to trade through quiet markets, I remember this principle. This principle has reduced my fear and increased my confidence immeasurably.

STRATEGY TRADING: MAKING GOOD BUSINESS SENSE

For me, strategy trading is the only answer to the problem of fear and greed, and it is the only logical way to take advantage of the concept of Market Facilitation.

First, trading a strategy provides the discipline necessary to begin overcoming fear and greed. Trading a strategy that has been back tested on historical, quantifiable data is a major way to inject discipline into your trading and to begin to control your fear and greed. If we think of a trading strategy as a small business, we can design our business to make money based on historical simulations. Then, our job becomes the implementation of the strategy rather than the interpretation of the

market. If the strategy loses money and busts, we change the strategy. It's a matter of good business sense.

Second, if we know that a market must facilitate trade to stay alive, we can devise strategies that guarantee that we will always be in for that inevitable big move. If we know that the big move will eventually come, and devise the strategy accordingly, our task becomes to minimize the drawdown (investment) while we wait. I have never been able to predict when the market was going to facilitate trade and get in for the big move. Instead, I have devised strategies to ensure that I will be in for the big ride and my losses will be minimized while I wait. It's just a matter of good business sense.

As a businessman, I have concluded that the only rational way to trade the markets is to trade a strategy. All of the hocus-pocus about predicting when this market will move, and how far, is just that—hocus-pocus. The people that make the big money are the ones who don't try to predict tops and bottoms but who consistently take a little out of the middle. The only logical way to do this consistently is through a well thought-out, well-designed strategy. It's a matter of good business sense.

THE ADVANTAGE OF TECHNOLOGY

Anyone serious about finding a profitable strategy should use the latest technology and the best software available. This means learning how to use a computer.

When I started trading, all historical testing had to be done by hand. This was labor intensive and very time consuming. It was necessary to peruse charts visually and record the simulated entries and exits by hand.

For intra-day charts, this process was even more time consuming—the charts had to be printed with the indicators on them and for a significant length of time (several months). If these indicators didn't prove to be profitable, the process had to be repeated for the next month with revised indicators. This process continued month after month. It would sometimes take me three to six months to find a strategy that would work under current market conditions.

System Writer, followed of course by TradeStation, was the first computer program to help eliminate this labor intensive historical testing. Using TradeStation to do your testing has three distinct benefits.

The first is the amount of time saved. With TradeStation on a fast PC, it's possible to test in 5 to 30 minutes strategies that literally used to take hours or days to test by hand. If you place any value on your time, this cost savings alone is impressive.

Second, you can avoid mental mistakes. I have, in both myself and in talking to other researchers, found a propensity for making mistakes when performing manual historical testing. On many occasions I have found myself changing the strategy midstream. I have sometimes made the assumption that of course I wouldn't have taken that particular trade, when the reality is I probably would have, or of course I would have moved my stop up, when in reality I probably wouldn't have, and so on.

I can recall many situations where, when testing manually, I got different results on different days with the same data and the same strategy. I was either in a different frame of mind or in a different emotional state and actually made different decisions on the *same* data!

A computer, however, cannot trade a strategy differently tomorrow using the same parameters and data as it is using today. Its logic is consistent and can't play tricks on it. For historical testing, you can avoid this very real problem by using a computer.

Third, you can be more creative. Rather than spend all of your time doing the testing, you can have the computer do the testing and you can spend your time researching new trading ideas.

Strategy development is like any other business. It's very unusual to find a successful business where only one individual has designed the product, does the marketing, is engaged in product development, and runs the machine to produce, package, and ship the product.

It is much easier and less stressful to hire a staff to handle the paperwork and production employees to make the product. The entrepreneur can then spend his or her valuable time in product development and planning the future of the company rather than running day-to-day operations.

In the trading business, TradeStation can be your staff and production employees. The program is indispensable in time savings, cost savings and individual productivity. It frees you from the repetitious side of the business so you can spend your time on the creative side—the side that will ultimately make you the money.

As the futures and securities industry continues to grow, more and more traders will enter this business. The competition for profits will continue to increase. For

example, in the early '80s it was very easy to make a lot of money day-trading the S&P. I used a simple dual moving average crossover strategy on 5-minute bar charts. There were proportionately very few intra-day traders with computers that were competing for profits. But since then, with the increase in the number of traders using intra-day charts, these very rudimentary indicators have stopped working. When everyone started using them, the profits dried up. It is much more difficult in today's markets to make the money that was there in the early years. The standard indicators just aren't that effective anymore.

I believe that the only rational way to be a successful trader is by using the best software available—TradeStation—and learning to be an effective strategy developer and strategy trader. The professional traders are all using sophisticated computers, and most of them are now using TradeStation. The technology resource differential of the past is now gone. An individual trader can afford the same technology as the successful professional. The playing field is now not resource driven but intellectually driven. Knowledge is more important than capital.

Don't Believe What I Say

The final thing I want to tell you before you delve into this book is not to believe anything I say. Check it out for yourself. It would be a mistake for you to accept anything I say without a complete personal investigation, testing it for yourself and either proving or disproving the principles and techniques that I discuss.

Just because I say it doesn't mean that it's true. It's what I believe to be true and has stood the test of time for me. But I urge you to be a skeptic, to think everything through and make sure it makes sense to you. Accept the things that work for you and reject those that don't.

The idea behind this book is to give you enough information so you can be self-sufficient. You shouldn't have to depend on anyone for your trading profits. You can do this yourself.

So we begin with three principles. First, the market must facilitate trade to survive; it must eventually make the big move. Second, you must be state of the art to compete, which means using the latest PC technology and TradeStation. Third, you can do this yourself, and you should not take what anyone says for granted.

You have the tools to be independent—to do this yourself.

Do not believe in anything simply because you have heard it.

Do not believe in traditions because they have been handed down for many generations.

Do not believe in anything because it is spoken and rumored by many.

Do not believe in anything simply because it is found written in your books.

Do not believe in anything merely on the authority of your teachers and elders.

But after observation and analysis, when you find that anything agrees with reason…then accept it and live up to it.

-The Buddha

Chapter 1: The Principles of Successful Trading

Over many years of trading, I've found certain principles to be true. Understanding and using basic principles provides an anchor of sanity when trading in a crazy world. Whenever I find myself under stress, questioning my judgment or my ability to trade successfully, I pull out these basic trading principles and review them.

Don't Try to Predict the Future

I used to think that there were experts and geniuses out there who knew what was going to happen in the markets. I thought that these traders and market gurus were successful because they had figured out how to predict the markets. Of course, the obvious question is that if they were such good traders, and if they knew where the market was going, why were they teaching trading techniques, selling strategies and indicators, and writing newsletters? Why weren't they rich? Why weren't they flying to the seminars on their Lear Jets?

NO ONE KNOWS WHERE THE MARKET IS GOING

It took me a long time to figure out that no one really understands why the market does what it does or where it's going. It's a delusion to think that you or any one else can know where the market is going.

I have sat through hundreds of hours of seminars in which the presenter made it seem as if he or she had some secret method of divining where the markets were

going. Either they were deluded or they were putting us on. I have seen many complex Fibonacci measuring methods for determining how high or low the market would move, how much a market would retrace its latest big move, and when to buy or sell based on this analysis. None has ever made consistent money for me.

NO ONE KNOWS WHEN THE MARKET WILL MOVE

It also has taken me a long time to understand that no one knows when the market will move. There are many individuals who write newsletters and/or books, or teach seminars, who will tell you that they know when the market will move.

Most Elliott Wave practitioners, cycle experts, or Fibonacci time traders will try to predict when the market will move, presumably in the direction they have also predicted. I personally have not been able to figure out how to know when the market is going to move. And you know what? When I tried to predict, I was usually wrong, and I invariably missed the big move I was anticipating, because "it wasn't time."

It was when I finally concluded that I would never be able to predict when the market will move that I started to be more successful in my trading. My frustration level declined dramatically, and I was at peace knowing that it was OK not to be able to predict or understand the markets.

Know that Market Experts aren't Magicians

Some of the experts that try to predict the markets actually make money trading the markets; however, they don't make money because they have predicted the market correctly, they make money because they have *traded* the market correctly.

THEY DON'T PROFIT FROM THEIR PREDICTIONS

There is a huge difference between trading correctly and making an accurate market prediction. In the final analysis, predicting the market is not what's important. What is important is using sound trading practices. And if sound trading habits are all that is important, there is no reason to try to predict the markets in the first place. This is the reason strategy trading makes so much sense.

THEY HAVE LEARNED TRADING DISCIPLINE

I have watched many market gurus continually make incorrect market predictions and still break even or make a little money because they have followed a disciplined approach to trading. More importantly, they used the exact same principles that I will show you how to use in creating your strategy. It is these principles that make the money, *not* the prediction.

To be a disciplined trader, you have to know how and why to enter the market, when to exit the market, and where to place your money management stops. You need to manage your risk and maximize your cash flow. A sound trading strategy includes entries, exits, and stops as well as sound cash management strategies.

Even the market gurus and famous traders don't make money from their predictions, they make it from proper trading discipline. Over the years, they have learned the discipline to control their risk through money management. They have learned to take the trades as they come, and not forgo a trade because they are second-guessing their strategy or the market. These are the same practices that you will learn to include in your trading strategy.

THEY PROFIT FROM SOUND CASH MANAGEMENT & RISK CONTROL

Sound money management and risk control are the keys to being a profitable trader. I will say over and over again, it is not the prediction or the latest and greatest indicator that makes the profit in trading, it is how you apply sound trading discipline with superior cash management and risk control that makes the difference between success and failure.

I often tell the story of the great fish restaurant that opened up just down the street from my office. It opened with great fanfare and was ranked in the top five restaurants in the city. The food was outstanding. But it only took a little more than a year and this great restaurant was out of business. Why? Because the key to running a good restaurant is not the food…it is cash management and risk control. It is making sure your business is run efficiently, keeping your costs (risk) in control, and managing your staff effectively. If you believe that the taste of the food is what makes a great restaurant, think of how great the food is at your favorite fast food restaurant. But, someday, watch how well that restaurant is run.

Just as in the restaurant business, the key to profits in trading is not in the prediction or the indicator, but how well the trading strategy is designed and executed. The ability to achieve risk control and cash management will make the difference between a successful trader and an unsuccessful trader. If you ever have the opportunity to watch a successful trader, you will see that they don't worry

about where the market is going or about predicting when the next big move will take place. They aren't looking to tweak their indicator. They are worried about their risk on each trade. Is the trade being executed correctly? How much of their total account is at risk? Are the stops in the right place? And so on.

THEY DON'T HAVE SUPERIOR PERFORMANCE NUMBERS

If you want to have some fun, look at the performance of a successful market expert, one who is known for his or her market predictions and trading expertise. You will find that their performance numbers really aren't any better than an average trading strategy. The percentage of profitable trades, the return on the account, average profit to average loss, number of losing trades in a row…all of these trading parameters are within the average trading strategy performance parameters.

Why is this? Because you can't predict where the market will go and when it will move. But if you use correct strategic trading disciplines, you will make money whether you try to predict the market or just trade a good strategy. You might as well save yourself a lot of time, energy, and mental anguish and trade a good strategy.

Be In Harmony with the Market

We make money trading when we are in harmony with the market. We are long when the market is going up, and short (or out of) the market when it is going down. If we bring an opinion with us while trading, we will end up fighting the market. We keep trying to go long as the market is declining, or we keep shorting a market that it is in a bull phase.

DON'T FIGHT THE MARKET

Fighting the market is not good for two reasons. First, we lose money. How much we lose depends on how well we are managing our money and controlling our risk. Second, fighting the market affects our judgment, and causes us to try to confirm that our judgment is correct, or persist in fighting a trend so that we will eventually prove to be correct. We figure that if we persist long enough, no matter how long it takes, we will eventually be right.

The same can be said for being in a canoe in a river. There is a reason for leaving your car downstream, launching your canoe upstream, and paddling downstream. It is much easier and eminently more fun to go with flow and paddle downstream.

We could do the opposite and paddle upstream. Eventually we may even get to our destination, but the cost would be substantial. It would take much more time, more physical and emotional stamina, and we would be constantly fighting the current. Reaching the goal would not be worth the cost.

Even if you ultimately make money fighting the market, it is not worth the price you have to pay, both financially and with peace of mind.

LET THE MARKET TELL YOU WHAT TO DO AND WHEN

The correct attitude for successful trading is to let the market tell you what to do. If the market says to go long, buy, and if it starts to go down, sell. This sounds easy but it is much more difficult than you think. We always like to believe that we can be in control. We want to be in control of our trading and of the market. If you accept the notion right now that you cannot control the market, that all you can control is your execution of trades, you will take a great step toward being a successful trader.

Instead of trying to control the market, let the market tell you what to do. Let the market and your strategy take you long rather than you personally trying to predict or decide when to go long. Let your strategy take you out or get you short. Once you realize that you can't understand the market, and that you can't predict when the market will move, you will move into that detached state of mind where you let the market take you where it will when it wants to.

THE MARKET GIVES AND THE MARKET TAKES AWAY

To remove your personal biases and let the market tell you what to do is to give up control, to give up the notion that you are actually in charge of how much money you make. For profitable trading, you need to move into the mental state of letting the market determine the profits, not you. It won't be whether you predict the market correctly that determines the profits, but whether your strategy is in a profitable mode or drawdown mode as determined by the market.

So, let the markets tell you what to do based on your strategy. Let it get you long and put you short. Let the market determine how much money you are going to make. Trade your strategy and let the market do the rest. And know that the market gives money and the market takes away money. Your goal should be to develop a strategy that gives you more money than it takes away.

Have a Healthy Time Horizon

One of the biggest problems new traders have is that they think they will make a large amount of money right away. They think they will get rich quick. This type of reasoning is very similar to the short-term thinking in American business in general, usually managing for the current quarter's profits, focusing on short-term earnings at the expense of long-term investment and profit growth.

TRADE FOR PROFITS OVER TIME

Traders tend to get wrapped up in current market conditions, the news of the day and the current trade, usually at the expense of the big picture and profits over time. My grandfather used to have a saying, "You can't go broke taking profits." He was very wrong. You can go broke taking profits. If you take profits before the market tells you to, or you succumb to fear and close out the trade before its time, you are focusing on the short-term and forgetting how to make money over the long haul. Close out no trade before its time.

GIVE YOUR TRADING STRATEGY ENOUGH TIME TO WORK

We tend to be impatient, and we sometimes think that we should get instant gratification. This will not work in trading. The only way you will really know whether you are a successful trader is to be successful over time. A week or a month will not be enough time to tell you how you are doing. You should be trading with the objective of making money in the long run, consistently, and with the confidence that your strategy will make money given enough time.

One of the benefits of trading with a strategy is that having done the requisite historical testing, you should know how long it should take you to start making money. You should have an idea as to the length of time that the strategy has lost money in the past, how much money it has lost, and how long it will take the strategy to become profitable. If the strategy has proven profitable historically, it should be profitable in the future. You just need to give it the necessary time to do its work.

Understand the Psychological Keys of Trading

There are many people who teach the psychology of trading. There have been many books written and effort spent on seminars trying to teach the discipline needed for trading. I don't think trading is that complex. I have developed a few simple psychological rules for myself, and once you accept them, they should greatly enhance your ability to trade effectively.

ACCEPT LOSSES AS A COST OF DOING BUSINESS

Most successful traders will tell you that the most difficult thing about trading is accepting the losing trade. We all have the desire to be to be right, to be correct all of the time. For novice traders, the losing trade means that something is not working and that you have somehow made a mistake. For experienced traders, losses are just a cost of doing business.

Some of the best traders in the world lose money on more than half of their trades. If you look at the performance results of the best traders and money managers, you will see that they all have a large percentage of losing trades. If you trade, I guarantee you that you will have losing trades. Learn to love losing trades. They should be your friend because you will be spending a lot of time with them.

USE HISTORICAL STATISTICS

I don't think anyone has ever traded without first looking at historical statistics. Even some traders who deny they are strategy traders have used historical data. And before EasyLanguage and TradeStation were available, most good traders developed a strategy's history by hand. I can remember countless hours pouring over charts spread out on the kitchen table, writing down trades by hand. Before I would trade it, I absolutely insisted on knowing what the strategy's personality was and how much money it would have made.

Using historical statistics gives you great peace mind, particularly in learning to love losing trades. Knowing the history of a trading strategy can give you tremendous psychological comfort during those tough periods of losing trades and drawdown. Historical statistics tell you how much money the strategy has lost in the past, how many losing trades it has had in a row, and the largest losing trade the strategy has experienced. This is very important information if you are learning to accept losing trades. Comparing historical data with the current string of losses and drawdown can give you much comfort that what you are experiencing now is

not unusual and has happened before. Maybe not in exactly the same manner, but it has happened before.

LET THE MARKET AND STRATEGY DETERMINE THE PROFITS

Don't have an opinion, don't try to predict the market, and don't try to second-guess your strategy. It's human nature to have an opinion about things, but this opinion can become a stumbling block if we let it affect our trading. One of the alluring aspects to having an opinion on the market is the exhilaration of being right. Even though we know that the chances of being right are slim, we nonetheless want to prove our intellectual prowess by being right.

Your trading strategy is ultimately a little business. You have developed and tested the product and are now operating the business in the real world. Let the strategy be the strategy. Let it make the money you know that it can. And know that if the market doesn't move in the manner that will allow the strategy to make money, it won't make money. Ultimately, the market determines the profit through its movement. If it doesn't make that move, there will not be profits.

Put the responsibility of making money on the strategy and the market. When they work together, you will have a profitable business.

Don't Trade for the Money

I have met many successful people, and the one thing that they have in common is that they love what they do. Many have told me they can't believe that they actually get paid for doing what they do. They have so much fun they feel guilty taking money for doing it. Many successful people will tell you that they would do what they do even if they weren't paid at all.

SUCCESSFUL PEOPLE DON'T WORK FOR THE MONEY

Work hard and love what you are doing and the money will follow. Successful people work first and count the money later. Sometimes they don't ever count it, and some don't even know (or care) how much they have. They just know that they have enough to allow them to continue what they are doing; working hard and having fun.

LOVE TRADING FOR ITS OWN SAKE

I know that many individuals want to trade because they think that they can make a lot of money easily and quickly. Because of the low start-up costs for trading as compared to other businesses, they think that trading should be the easy road to riches. Their goal is to make a lot of money fast. These are the people who come to seminars and want an indicator that will guarantee profits. They don't want to learn the ins and outs of the business; they want the magic indicator that will get them the money they desire. They are doomed to failure.

I remember a guy named John walking into a seminar I was about to teach. He threw up his hands and said, "Ah, Traders! I am glad to be home." This individual was a successful trader. John loved going to seminars, not so much for the techniques and indicators, but for the camaraderie. He loved being around traders, talking with traders, analyzing trading strategies and techniques, and learning about the latest and greatest trading technology. He loved learning the latest features added to TradeStation and finding out a new way to use EasyLanguage.

He loved designing new indicators, and spent countless hours working on new and different ways to exit the market. He was excited about getting up early in the morning to monitor the overnight market information and checking what the S&P was doing in London. He looked forward to calling his broker and putting in his orders. He loved watching his strategy run on TradeStation. He was exhilarated when he had to call his broker and give him a lot of grief for the latest bad fill. He even loved losing trades. Even when he had to take a losing trade, he was still doing what he loved to do—trade.

John is a successful trader. He loves what he is doing. And as long as he can keep on trading, he will be happy. The money he makes is secondary, but he makes a lot of it. He can't believe that he can have all of this fun and make money as well.

Concentrate on Execution

All of your market and strategic analysis should be done before the markets open. The strategy design should be clear in your mind. You should have the historical Performance Summary of your strategy at your fingertips to remind you of the personality of the strategy, how much money it has made over time, and what its largest string of losses in a row has been. You should know what kind of orders you are going to place, and how you are going to communicate this to your broker.

The last thing you should have to worry about during market hours is where the market is going, and whether to be long or short. Your strategy will tell you all of this. You should not be concerned about the news, or even if you are making or losing money. You should not be concerned with analyzing the market, always reserve this for when the market is closed.

The only thing you should be doing during market hours is concentrating on effectively executing your strategy. If you can't execute your strategy effectively, there really is no point in trading. There are two sides to trading, strategy development and trading execution. During market hours is when you should concentrate on execution and nothing else.

Always Be In the Market

I have always characterized trading the trend as "keeping your costs down while waiting for the big move." We know that to trade profitably, especially for trend traders, you need to be in the market for the big move. Many traders stay out of the market when it's quiet and try to predict when the big move will occur. These people invariably miss the big move.

Instead of trying to predict when the big move will occur, your task becomes to minimize your losses and drawdown while you are waiting for the big move to occur. This is a different way of looking at trading that focuses on managing cash flow and risk rather than finding magic indicators and making good predictions. Trading thus moves from a hobby to a business.

The only way to ensure that you won't miss the big move is to always be in the market.

Buy High - Sell Low

Probably the most interesting rule for successful trading is to "Buy High and Exit Higher, and Sell Low and Exit Lower." This is counter-intuitive to what we all have a natural inclination to do, which is buy low, sell high. Most great trading strategies are counter-intuitive. They are not based on our normal human nature and the normal human reaction to the markets. They consistently make money because they are designed with market sense not human common sense.

In the final analysis, any market is just a collection of individuals making decisions and placing money in the market based on these decisions. Most of these

individuals are doing what comes naturally to humans, buying low and selling high. Statistics show that 95% of these people lose money.

To be a successful trader, you have to do the opposite of what this 95% is doing. It isn't easy, because it goes against your human nature. But any strategy that is successful over time will most likely follow the rule of "Buy High, Exit Long Higher and Sell Low, Exit Short Lower."

NOTE: What you have just read has been presented solely for informational or educational purposes. No investment or trading advice or strategy of any kind is being offered, recommended or endorsed by the author or by TradeStation Technologies or any of its affiliates, agents or employees.

Chapter 2: The Path to Successful Trading

In the broad category of "trading the markets," there are basically three types of trading: discretionary, technical, and strategy-based. When I sat down to write this book, my intent was to write only about strategy trading. But then I realized that to fully describe strategy trading, it was also necessary to discuss discretionary and technical trading. It's important that you understand the difference between them, which is not always clear. I've met many people who believe they are strategy traders when they're actually technical traders, and vice versa.

I have known and taught many traders, and have observed that there are four distinct stages of trader education: discretionary trader, technical trader, strategy trader, and complete strategy trader. All successful traders have gone through them. It is almost impossible to be a successful strategy trader without going through all of these stages. My goal with this book is to help you understand and move through the stages at much less cost in both time and money.

Every trader usually starts out as a discretionary trader. The amount of money lost generally determines how long it takes the individual to start using technical indicators to make trading decisions. Eventually, as even employing technical indicators fails to move the trader into profitability, the trader moves into the third stage and starts to write strategies based on quantifiable data. It is at this stage that the trader ordinarily starts to make money. Finally, the strategies and money management approaches are refined and the individual becomes successful as a strategy trader.

The Discretionary Trader

A discretionary trader uses a combination of intuition, advice and non-quantifiable data to determine when to enter and exit the market.

Discretionary traders are not restricted by a concrete set of rules. If you are a discretionary trader, you can make buy and sell decisions using whatever criteria you deem to be important at the moment. For example, you can use both a combination of hot tips and relevant news stories from *The Wall Street Journal*, and enter or exit the market based upon this information. If you begin to lose money, you can immediately exit the market and change your trading method. You don't have to use the same techniques day in and day out. It's a very flexible way to trade that you can customize based on what you think the market is going to do at any given moment.

For the discretionary trader, trades are made using gut instinct and intuition. Unless a computer is generating a buy or sell signal and you actually follow the signal, your emotions will affect your trading. I explained in the introduction what problems instinct and intuition could be in trading. Remember fear and greed? In discretionary trading, technical tools such as indicators are sometimes used; however, when they *are* put to use, they are utilized sporadically as opposed to systematically.

Fascinated by the markets, the discretionary trader is ready to put on a trade at a moment's notice. The most uncomfortable part of trading for the discretionary trader is when there is no action. So he will jump on any piece of information, anything that will permit him to take a stab at the market. Above all, he craves the action.

INTUITION & HOT TIPS

The discretionary trader uses several sources for his trading decisions. One is intuition, for example, "I see a lot of people in stores, so I think the economy is good, and earning will increase, so the stock market should go up, and I should buy Sears." He usually spends a lot of time talking to his broker. "What do you think Joe, isn't Woolworth's going to turn around?" Another is reading and watching the news, "Retail sales are looking strong and Woolworth's is closing stores to lower their overhead."

Hot tips are a common way that a discretionary trader gets ideas. A call from his broker or good friend, or a tip from a discussion at a cocktail party are all places the discretionary trader gets his trading ideas. "Hey George, HTECH Corp. has a

hot new product in the works, here's a stock you can pick up cheap." If it gets dry in the summer, our discretionary trader may decide to buy Corn, Beans or Wheat. However, when he looks out the window and notices that it's raining, he sells the position immediately. A news story on the nightly news may cause a discretionary trader to short the airline that has just had a crash.

CRAVES EXCITEMENT

What a discretionary trader loves is the excitement. He loves being "in the markets," playing with the big guys. He craves the risk, the excitement of trading, and the gambling rush that he gets from calling his broker and putting in the order to buy. He loves being able to sell Gyro Corp. based on the news story of the health hazards of their top selling Gyrometer. He has a real obsession for buying Cotton based on the hot tip from his broker that the upcoming crop report was going to be bullish, and he covets the tip from his friend who called to say that he just bought Techno Corp. because the latest quarterly earnings were going to be a surprise on the upside.

Discretionary traders retain the flexibility of changing their buy and sell criteria from moment to moment, and change they way they trade from minute to minute and day by day. "Well, that last trade was a disaster, so tomorrow I will buy McDonald's only if it opens up from yesterday's close." They don't have any discipline, nor do they think they need any. They use their intuition and their gut instinct, and feel justified in doing so. They think, "Making money is easy, you just have to be smarter and quicker than the next guy."

I personally don't know anyone who has made money by discretionary trading. They may have been lucky and won on a few trades, but overall, over time, discretionary traders always lose money.

It is after enough money has been lost that the discretionary trader in some way stumbles across technical indicators. It may be from the chart book he just looked at where there was a Stochastic Indicator underneath the chart. Or he may have gone to the latest *Make a Million Dollars Trading the Stock Market* seminar and found out that using the Relative Strength Indicator is the sure way to stock market profits. He thinks, "So this is how they do it!" These indicators look like magic. They add some rationality to an otherwise irrational trading style. He thinks, "This must be how the big money players make the big money—they use technical indicators!"

DISCOVERS TECHNICAL INDICATORS

Once the discretionary trader discovers technical indicators, he or she incorporates some rudimentary ones into trading, usually as additional justification for making the trade. "Not only did Ralph (my broker) tell me to buy Gizmo Corp. but Gizmo has great relative strength. Gizmo's moving averages are bullish, and the Stochastics are oversold and giving a buy signal as well."

These newfound technical indicators give the discretionary trader a new lease on trading. Now our trader has a whole new world in front of him—the world of technical trading. For a while, this newfound world combines with intuition and the discretionary trader views himself as a strategy trader. He says, "I trade a strategy using moving averages and Stochastics with a dash of daily news and tips from my broker. I am now a real objective strategy trader." While the trader may view himself as a strategy trader, this could not be farther from the truth. The discretionary trader's style is still undisciplined, based on newly educated guesses, and he is probably still losing money.

For a moment, these technical tools were thought to be the answer, and while they add a little more rationale to his trades, the losses continue to pile up. Despite his continuing angst, our discretionary trader is now on the way to becoming a technical trader.

The Technical Trader

A technical trader uses technical indicators, hotlines, newsletters and perhaps some personally defined objective rules to enter and exit the market.

As a technical trader, you are beginning to realize that rules are important and that it is appropriate to use some objective criteria such as confirmation before making a trade. You have developed rules, but sometimes you follow them and sometimes you don't. It depends how confident you feel today and how much money you are making or losing. If an indicator gives you a buy signal, you may override it because your broker told you the earnings report was going to be negative. Or maybe the bonds are up, which means interest rates are rising, and you better see how high rates go before you commit more money to this already overpriced market. You may think, "I have a profit, hmm, I just may take it now. Even though the Stochastic is not overbought, the markets are tough. It's not easy to make money. Like my father said, 'you can't go broke taking profits.' At least now I have a winning trade. I'll sleep well tonight."

Our trader now begins to realize that using the intuitive and hot tip approach will not lead to profitability. He now begins to focus on the technical indicators themselves. There are so many! Moving Averages, Exponential and Weighted. The MACD, Momentum, P/E Ratio, Rate of Change, DMI, Advance/Decline Line, EPS, True Range, ADX, CCI, Candlesticks, MFI, Parabolic, Trendlines, RSI, Volatility Expansion and Volume and Open Interest, just to name a few. So much to learn and so little time!

This whole new world of technical books, seminars, newsletters, and hot lines now begins to preoccupy our trader. He learns all he can about indicators. He wants to find the one indicator that will ensure profitability. He surrenders to what I call Indicator Fascination.

INDICATOR FASCINATION

The first assumption that our trader makes is that someone out there must know how to do this. There must be an expert, someone who knows how to make money, that has created the magic indicator to do it. This is the Holy Grail syndrome and our trader now embarks on a search for the Holy Grail Indicator. He knows intuitively that there must be an indicator that will give him the information he needs to make profitable trades…that there must be teachers out there that know how to make money trading. He thinks, "All I need to do is find him and his indicators."

This is the indicator fascination phase. How are indicators calculated, what do they represent, and are they the "secret" to making money? All of these questions need to be answered so he becomes a seminar junkie, travelling the country on the quest for that great technique, the one that everyone uses to make the big money. He visits Chicago one month…L.A. the next…followed by a visit to the Chicago Mercantile Exchange. He watches the CNBC expert technicians and surfs the net looking for that magic indicator.

Now he'll only buy when the ADX is moving up and the MACD is positive, and he'll sell only when the RSI gets overbought and turns down. His trading becomes more indicator-based and he listens less to his broker. For example, he may tell his broker, "No, I won't buy Apple Computer until the Earnings Momentum Indicator is over 80!" Unfortunately, even with all of this information, and all the assurances of his seminar leaders, he still is not making money. He even begins to wonder if he will be able to continue trading with all of these losses. He thinks, "If I could only control the losses, I will probably be able to trade a little longer before my money runs out."

It is at this stage that he learns the value of stop losses, known as *stops*. He learns the importance of managing the risk on each trade. He gets a hint that there is more to trading than just the indicator, and his ears perk up when people mention the concept of controlling risk and conserving capital. He thinks, "I just want to stay in the game, to keep enough money to make the next trade. I don't want to quit a loser!"

But even with the newly found indicators, and controlling his risk with stops, he continues to lose money, although he also consummates some winning trades that keep his capital from depleting too quickly. And here he has another major revelation—markets can be trending or choppy. It is at this point that he realizes, "If I could only predict the choppy markets, where I lose most of my money, I could simply stay out of the market and get back in when it starts to make the big move." So he starts another quest, that of leaning how to predict choppy markets.

PREDICTING THE MARKETS

Discontinuing the use of the old technical indicators, our technical trader now begins to flirt with the Elliot Wave theory, W.D. Gann techniques, and Fibonnacci Targets and Retracements. These techniques generally claim to help you predict when the market will be choppy and where and when it should be bought and sold. He does all of this studying so he can learn to stay out of choppy markets. It makes a lot of sense. Someone out there must know when the markets are going to go sideways and then step aside waiting for the next big trend. When the trend comes, they get on it and ride it for big profits. They then exit and wait for the next trend. He hears promises that he should be able to forecast all of this by using these predictive techniques.

Unfortunately, after several seminars, our trader tries to predict a corrective stock market and ends up mistaking it for the next big wave up. He explains to his friends, "I missed the big move because I thought we were in Wave B but the market was really in Wave 2 ready to start Wave 3. If I had just used my old trusty indicators instead of trying to predict the move and waiting, I would have made big bucks."

HISTORICAL PROBABILITIES

It finally occurs to him that he should back test some techniques and see how some of his indicators would have worked historically; he reasons that if he can do this, he would have more confidence and discipline in his trades. He begins to understand that no one (including himself) can predict the market. He starts to realize that he needs to have some confidence that the techniques he is going to

use have worked in the past. He now knows that he can't predict the market. He thinks, "All I really need to know is what the probabilities are when I put on a trade according to my rules, and I should make money."

Our technical trader has now passed the second big initiation and begins to sense the need for trading a strategy. He realizes that there is immense value in historical strategy performance data. He purchases TradeStation and dives into learning how to design and trade strategies.

The Strategy Trader

A strategy trader trades a strategy—a method of trading that uses objective entry and exit criteria that have been validated by historical testing on quantifiable data.

Strategy traders are restricted by a set of rules. These rules make up what is known as the strategy. As a strategy trader, you will not deviate from your strategy's rules at all, unless you have decided to use a different strategy altogether. When your strategy tells you to buy, you buy. When your strategy tells you to sell, you sell. And you buy or sell exactly how much your strategy tells you to. You read *The Wall Street Journal* and talk over the markets with your broker, but you don't make trading decisions to override your strategy because of something you read or heard from your broker.

The reason you are restricted by your rules is that your rules are sound. As a strategy trader, you've spent a lot of time and research in creating those rules. Your rules have been hand-designed by you and tested and re-tested on years of historical data. This testing has given you positive results and the conviction that lets you know it's time to take your strategy into the future. Your emotions might still fly as high and low as the market, but at least they are not causing you to make bad trading decisions.

Our strategy trader has now left behind the gurus, the hotlines, and the broker recommendations, and has stopped trying to predict which wave the market is in and how far it will go. He has purchased and learned how to use TradeStation. He is becoming knowledgeable about computers, data and technology. He has realized the value of quantifiable data and back testing, and starts to put on trades with the confidence that comes with knowing the historical track record of the same strategy for the last 10 years. He is slowly learning the business of trading.

QUANTIFIABLE DATA

One of the first things a strategy trader needs to understand is quantifiable data. This is the data that he will correlate to the market and use to develop his trading strategy. Without quantifiable data, he would be unable to trade a strategy.

Quantifiable data is measurable data. Stock and commodity prices are quantifiable, as is volume. All technical indicators that are derived from price and/or volume are quantifiable and useable in designing a strategy. Are phases of the moon quantifiable? Yes, as are the location of the planets. They occur in a regular pattern, and each occurrence is measurable and predictable. What about earnings per share or the price earnings ratio of stocks? Yes. These are also quantifiable and can be used in strategy trading.

Once you understand what quantifiable data is, it is easier to spot non-quantifiable data. Non-quantifiable data usually consists of random events that cannot be reduced to a number and that cannot be predicted. For instance, speeches by politicians are not quantifiable, although we know that they can have a profound effect on stock prices. Opinions of our broker are not quantifiable. Are earnings surprises quantifiable? No, but quarterly earnings reports are, and they usually have a significant effect on stock prices. Are weather patterns, droughts, or freezes quantifiable? No, although we know they too have a considerable effect on commodity prices, it is not possible to quantify droughts and correlate them to Soybean or Corn prices.

A strategy trader thus moves into a mode of acquiring and testing quantifiable data as it relates to historical price activity. This is a marked difference from a technical trader, who tries to correlate data to price but usually through observation and intuition, and from the discretionary trader, who doesn't use quantifiable data at all or feels he needs to in order to make money.

It is this acquisition and use of quantifiable data, along with the software to test it, that enables the strategy trader to investigate trading techniques historically and begin to put some rational and enlightened business practices to use in his trading. It is this process that enables him to start finally making money.

HISTORICAL ANALYSIS

For some time now, our strategy trader has been using TradeStation to develop trading strategies. He has learned rudimentary EasyLanguage and is actively testing various trading strategies. He has learned that just because something looks good visually and is profitable over a short period, it might not make money

over a long time frame. He has also experienced the confidence that comes from knowing that a particular strategy has been profitable in the past.

Even though he knows that the market will never quite replicate that past, it is much more comfortable to trade a strategy that has been historically tested than to trade intuitively. He knows that the success of a strategy is not directly tied to the indicator, but to other factors: exits, money management stops, and cash flow management.

Because of the extensive time he has spent working with TradeStation, he also knows the ins and outs of risk control. He has done extensive back tests and found out that if he puts his stop losses too close, the strategy takes too many trades and makes less money. He has studied set-up and entry and how they work together to get you in the market. He knows the difference between exits and money management stops. He can now historically test any indicator or technique and immediately know how profitable it was in the past. He doesn't have to rely on anyone but himself to make trading decisions.

The strategy trader has also learned much about himself in this process. For instance, he has learned how much money he is willing to risk on any trade. He knows he can't take a hit for, say, more than $1,500. He knows that he can only take a certain amount of drawdown and can only stomach a certain number of losing trades in a row. He may refuse to trade a strategy that has more than four losing trades in a row. He just knows himself, and he knows he wouldn't be able to handle it. He adjusts any strategy he develops to account for this. However, maybe he can watch his account go through a $12,000 drawdown if he knows that he won't have a lot of losers in a row; especially if he has the historical information that confirms that a $12,000 drawdown is not unusual for his strategy.

The key is that he has learned to customize the parameters of his strategies to fit his personality. There is no point in designing a great, profitable strategy if you won't be able to trade it!

The Complete Strategy Trader

The complete strategy trader has learned to use advanced cash management principles, trades multiple markets, and may trade multiple strategies in each market.

The successful strategy trader realizes that the key to long-term profitability is how the cash flow is managed, not what indicator is used. He is done with trying to predict the markets and has stopped looking for the Holy Grail indicator. He understands that strategy trading is not unlike most other businesses and, as a result, has turned his trading into a sophisticated business based on sound business principles.

Remember the great fish restaurant that I mentioned in Chapter 1. It opened and immediately received rave reviews; it was ranked four stars (out of four) by all of the restaurant critics. It was hard to get in at peak times because you always got a great meal. Again, it is not the food that makes a successful restaurant.

Of course a restaurant needs a good chef and good food. But to stay in business it needs much more than good food. Costs, service levels, and cash flow need to be managed effectively. I realized that many successful restaurants have mediocre to poor food (just visit any fast food joint). But they stay in business because the management has mastered restaurant management, which has nothing to do with the taste of the food.

Trading is really no different. Traders become successful because they understand trading management. Trading management has nothing to do with indicators, but has a lot to do with the details of managing trades and cash flow effectively. The complete strategy trader can say, "Of course I need solid indicators, and I have my favorites. But I think with what I know about trading now, I could make any indicator profitable."

Successful traders understand that to be successful and stay in business more is needed than simply a great indicator.

CASH MANAGEMENT & RISK CONTROL

Our strategy trader is now spending a lot of time using TradeStation to focus on cash management. He has found a group of indicators that he trusts, has back tested, and has worked with for enough time now so that he knows their strengths and weaknesses. He'll tell you, "I have finally realized that there is no Holy Grail. There is only so much money in the markets and most indicators can be rigged to catch most of the moves. The real task is to manage your money efficiently to take advantage of market moves."

Our trader is now focused on refining techniques concerned with how to scale into a potential big move, and how to scale out as the market moves in his direction. He is focusing on the value of pyramiding a position to maximize the

leverage of his open equity. He is using his accumulated net profit to be able to trade bigger positions without risking his own capital. The successful strategy trader focuses his TradeStation testing on the percentage of his account that should be risked with each trade, so as to maximize his profits and minimize the drawdown.

Don't underestimate how critical the size of your trade is, and how important it is to add to a position at the right time. This may be more important than the strategy itself!

TRADES MULTIPLE MARKETS

Our strategy trader has observed that to maximize his return, he must trade multiple markets. At any given time there may be only one or two sectors moving. If you are only trading one market, you will have to wait for the next big move and fund the drawdown. The more markets you trade, the greater the chance that one will be in a big move. It is also likely that the profits in the markets that are moving will be greater than the drawdown in the markets that are not. That is the ideal situation because you can then reduce the fluctuation in equity and have a more predictable cash flow.

Our strategy trader now understands the age-old notion of market diversification. With back testing, he is now able to test the combination of strategies and markets and how they integrate into a comprehensive trading strategy. An overall strategy is now coming into focus that includes trading several markets.

TRADES MULTIPLE STRATEGIES IN EACH MARKET

Our strategy trader has also learned to recognize that every market goes through different types or phases of movement. He is finding out that it is possible to define what that movement is and develop a strategy to profit from that action. He may say, "I used to only make money when a market was in a trend; I am basically a trend trader. But a few months ago I added a Volatility Breakout strategy to compliment the trend strategy. When a market is not trending, I can still get some money out with the VB strategy. This money to some degree funds the trend-following strategy drawdown in a non-trending market, and levels out my overall cash flow."

As you can see, our trader is now talking an entirely different language. He has become a sophisticated money manager, intent on maximizing the profits of his business. He has come a long way from being a seminar junkie, consumed with Indicator Fascination. He realizes the value of technology, and the immense

capacity of software like TradeStation. He adds, "I really don't know how I would do this without today's software and technology. It would be like trading blind." Or like being a discretionary trader.

Decision Models

I have always been interested in the science of how we as human beings make decisions. Life is really all about making decisions. If we can improve the way in which we make decisions, it stands to reason that we will be more successful in life. If we can improve the manner in which we make our trading decisions, we will become a more effective trader and hopefully make more money.

In my early years of trading, I always wondered whether there was statistical proof that strategy trading was inherently more profitable than other types of trading. I knew from my own experience that it was but I was unable to prove it statistically.

I then picked up a book called Decision Traps[3]. This is a book about the process of decision-making and I picked it off the bookstore shelf when I was attempting to learn how to become better at trading. I didn't know at the time that it would put forth the notion that objective decisions (i.e., strategy trading) produce far superior results than other non-objective forms of decision making.

In this book, nine different types of decisions were tested using each of the three different decision methods. The accuracy of the decisions was then compared and analyzed for effectiveness in predicting final outcomes. The investigator looked at different types of decisions, predicting grades, predicting recovery from cancer, performance of life insurance salesmen, as well as predicting changes in stock prices. He used three different decision making processes: an Intuitive Prediction Model, a Subjective Linear Model, and an Objective Linear Model. Interestingly enough, these can be compared to our 3 types of traders: discretionary, technical and strategy.

INTUITIVE PREDICTION MODEL (DISCRETIONARY TRADER)

Intuitive prediction is defined as making a decision without the use of any objective or quantifiable data. For instance, in trying to predict the academic performance of graduate students, the researches asked their advisors to do so without seeing their grades and just by talking to them. The decision-makers had to rely on their intuitive impressions and any other factors they thought relevant (how the students dressed, their language skills, grooming habits, etc.).

This is the same way our discretionary trader makes trading decisions—using intuition and gut instinct. Although he might think he does, he does not use any objective criteria. In predicting the stock prices, it is highly likely that the researcher engaged a discretionary trader to predict the future prices of stocks.

SUBJECTIVE LINEAR MODEL (TECHNICAL TRADER)

A Subjective Linear Model is a much more complex decision making process. It starts with interviewing experts in a field and learning how they make decisions. The researcher literally asks the expert how he or she makes decisions and they respond by explaining how they make their predictions. Although these experts are not using quantifiable data, they have enough experience and knowledge in their field to be successful. This decision making process is then outlined by the researcher.

For instance, a physician, highly experienced in treating cancer, probably has become fairly adept at predicting the life expectancy of his patients, even without using any objective data. The researcher interviewed the physician and attempted to determine exactly how the physician made this assessment. Then the researcher put this newly quantified data into a regression model and attempted to predict the life expectancy of cancer patients.

This is very similar to how our technical trader makes decisions. He goes to seminars and reads books to learn how the experts make decisions using technical indicators. He then takes what he learns and attempts to trade like the experts. In a sense, he does his own regression model of the expert's process to make trading decisions.

OBJECTIVE LINEAR MODEL (STRATEGY TRADER)

For the Objective Linear Model, the researcher developed an objective model based on historical tests and observations to predict results. This is defining and using quantifiable data, running historical tests, and then using the results of the tests to predict future outcomes.

For instance, the researcher would look at reams of physical data from cancer patients, and correlate the data with how long the patient lived. After running the historical tests, the researcher would then obtain the physical data from a cancer patient, and using the historical test data, attempt to predict how long that cancer patient will live.

This is exactly what a strategy trader does. He runs historical tests and then uses that data to take a position in the market. He uses objective, quantifiable data tested historically to make his trading decisions. Table 1 shows the results of the tests.

Types of Judgments	Intuitive Prediction	Subjective Linear	Objective Linear
Academic Performance of Graduate Students	.19	.25	.54
Life Expectancy of Cancer Patients	-.01	.13	.35
Changes In Stock Prices	.23	.29	.80
Mental Illness using Personality Tests	.28	.31	.46
Grades and Attitudes in Psychology Course	.48	.56	.62
Business Failures using Financial Ratios	.50	.53	.67
Student's Ratings of Teacher's Effectiveness	.35	.56	.91
Performance of Life Insurance Salesmen	.13	.14	.43
IQ Scores using Rorsach Tests	.47	.51	.54
Mean (Across all Studies)	**.33**	**.39**	**.64**

In every case, the Subjective Linear Model outperformed the Intuitive Prediction Model but only by a small margin. If you look at predicting the changes in stock prices, the Subjective Linear Model only slightly outperformed the Intuitive Prediction Model. This correlates very closely with my experience in trading. Technical traders do only slightly better than discretionary traders and neither of them make much money. While the difference in expertise and experience between a discretionary trader and a technical trader is substantial, the resulting profitability is hardly noticeable.

The real insight from this study comes when we look at the results of the Objective Linear Model. In every case, the Objective Linear Model outperformed both the Intuitive Prediction Model and the Subjective Linear Model. In some cases, the improvement was minor, and in others it was substantial. It is interesting to observe that the greatest improvement came when using the

Objective Linear Model in predicting the changes in stock prices. Here was the proof I was seeking—a definitive study showing the benefits of objective decision-making as opposed to other forms of decision-making.

This is my experience as well. The greatest improvement in trading results (profitability) comes when a trader begins to use objective quantifiable data and does historical tests to develop trading strategies. In this study, this is confirmed not only with changes in stock prices, but in the other disciplines also. If there ever was a case to be made for considering strategy trading, this is it.

The Benefits of Strategy Trading

I believe that a trading strategy, which has been properly developed and tested, can make you more money than trading any other way. However, this is not the only reason that strategy trading is the method of choice for most successful traders. There are other benefits as well. One of the most important benefits is that you can sleep well at night knowing that you're trading a strategy that has been tested and re-tested, and is proven to be successful. No matter what happens in the market during the day, the confidence you have in your strategy makes this type of trading easier on you.

Another advantage is that you can choose a market and a trading strategy that compliments your personality. The basic idea is that the trading strategy you select is based on the type of market action you are the most comfortable trading. Those who desire to always be in the market will select a different strategy than people who prefer short-term positions. If you get a thrill out of riding the big trends, then you will select a different type of strategy than someone who enjoys going against the trend.

Have you ever received an unexpected call like this, "Hi, Joe. This is Stan, your broker. We need to settle the margin on your account. Looks like the market really went against you this week"?

If you are a strategy trader, this is not likely to occur. Strategy traders always know where they stand financially. They know this from the financial results of the historical tests. If you do get a call like this, you will most likely be expecting it and will have planned for it. You have creatively designed a strategy based on the amount of money you have to work with. As a part of knowing the maximum equity drawdown associated with your strategy, you can determine the strategy's capital requirements and make adequate provisions to provide enough capital to maneuver through the eventual drawdown. There will be no financial surprises.

I've been talking at length about why strategy trading is the most viable way to make money in the markets and what type of skills and knowledge are necessary to be a successful strategy trader. I showed you a study that in my view gives very solid proof that strategy trading (objective decision making) is the most successful way to make decisions. If there was ever any doubt in my mind, this study cleared it up. I hope you are now convinced that if you want to make money you should be a strategy trader.

So let's go on to the nuts and bolts of creating viable trading strategies.

Chapter 3: Markets, Strategies & Time Frames

The first step in developing a trading strategy is to select the market action and corresponding strategy type that you want to trade. As I've discussed, selecting a strategy type is a very important part of strategy trading and you should take your time in evaluating the alternatives. Many factors will influence your decision, but your own personality will ultimately direct you to the strategy that is right for you. In making the choice, the most important thing to remember is that it is yours to make alone. Read everything I have to share with you about different types of strategies, but then decide for yourself. Only you really know what type of person you are and therefore what type of trading is best for you.

This chapter will help you to understand some of the conditions that can occur in the market, and the strategy type that complements those conditions. Once you are familiar with the basic strategy types, you will be able to select the one you want to use.

Three Market Types

Generally, there are three types of markets. The three market types, or phases, are derived from three distinct chart patterns that appear when there is a shift in market action. The phases are trending, volatile, and directionless, and each can be characterized by specific price activity. Take a look at the following charts and familiarize yourself with each different market pattern.

TRENDING MARKET

A sustained large increase or decrease in price characterizes a trending market. Take a look at Chart 1. This weekly chart of Coca Cola (KO) from early to mid-1997:

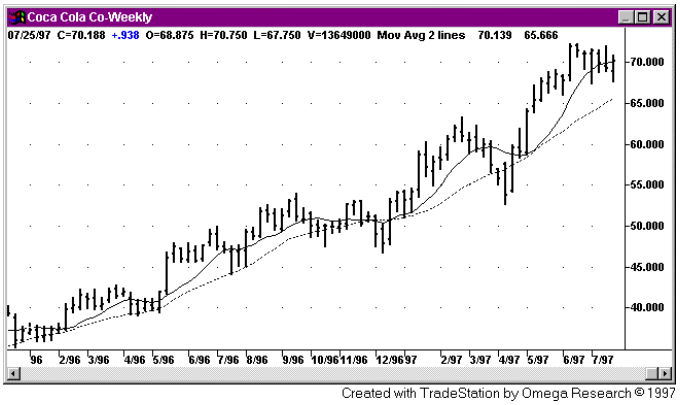


Chart 1

TradeStation EasyLanguage
Indicator: Moving Ave Cross

```
Input: Price(Close),Length1(9),Length2(18);

Plot1(Average(Price,Length1),"SimpAvg1");
Plot2(Average(price,Length2),"SimpAvg2");
```

In fact, this stock has been in an up-trend since 1994. KO has almost tripled since then. This trending market was characterized by sustained up moves with very small and short-lived corrections. The 9- and the 18-period moving averages are included in Chart 1. A trend trader would buy the market when the shorter 9-period moving average crosses above the 18, and hold the stock until the 9-period average crosses below the 18. In this time period, he would have held KO for at least two trend moves.

Now take a look at this daily chart, Chart 2, of the Swiss Franc from mid-1996 to early 1997:

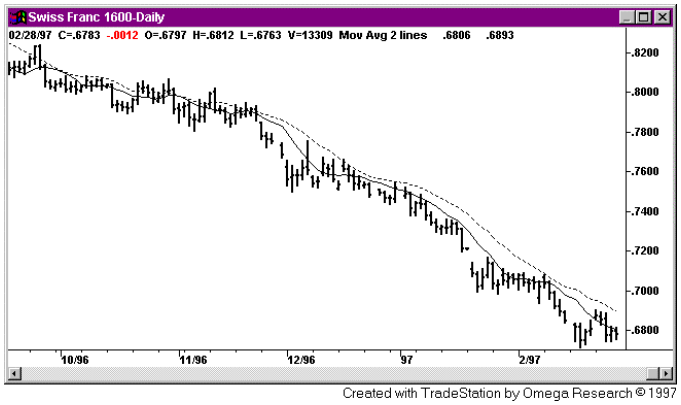


Chart 2

TradeStation EasyLanguage
Indicator: Moving Ave Cross

```
Input: Price(Close),Length1(9),Length2(18);

Plot1(Average(Price,Length1),"SimpAvg1");
Plot2(Average(Price,Length2),"SimpAvg2");
```

In this time period, the Swiss Franc has been in a daily downtrend for many months. It has lost more than 15% of its value over the period. This market was characterized by a sustained downmove with very small corrections. The same

moving averages were plotted here, the 9 and 18. Note that if you had followed these averages, you would have stayed short for several months at a time.

The time frame you are looking at is important when you consider the type market action. Chart 3 shows the same Swiss Franc viewed on a monthly instead of daily chart.

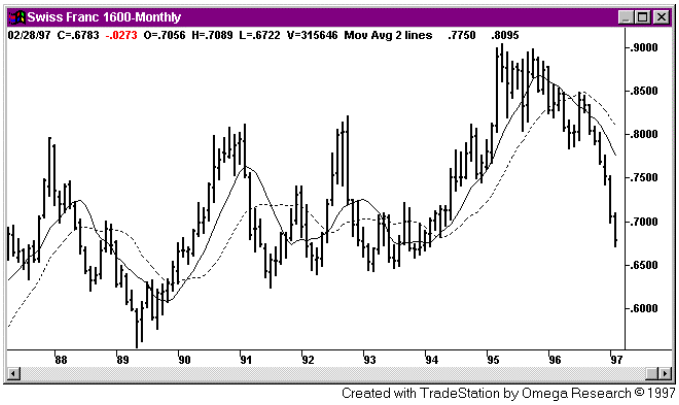


Chart 3

TradeStation EasyLanguage
Indicator: Moving Ave Cross

```
Input: Price(Close),Length1(9),Length2(18);

Plot1(Average(Price,Length1),"SimpAvg1");
Plot2(Average(Price,Length2),"SimpAvg2");
```

The downtrend in 1996-1997 looks a little different when put in this perspective. It looks like the most recent move in a directionless market. And if you had traded the same moving averages on Chart 3, you would have been chopped around and most likely lost a lot of money. The point is that you should be aware that a directionless monthly *or* weekly chart might have very tradable daily trends, and vice versa.

DIRECTIONLESS MARKET

A directionless market is characterized by smaller, insignificant up and down movements in price, with the general movement sideways. We probably would not call Chart 3 of the Swiss Franc directionless because the movements were not insignificant.

On the other hand, Chart 4 of Caterpillar in 1996 clearly shows a sideways directionless market, whose movements I would call insignificant, as the stock moved between 31 and 37 for most of the year. Markets chop around like this between trends. As you can see, I put the Stochastic Indicator on this chart. The Stochastic Indicator is commonly used as an overbought/oversold indicator. In directionless markets, you might
attempt to buy CAT when the Stochastic is at or below 20 or 25 and sell when it is above 75 or 80. You could have made some money doing this with CAT in 1996.

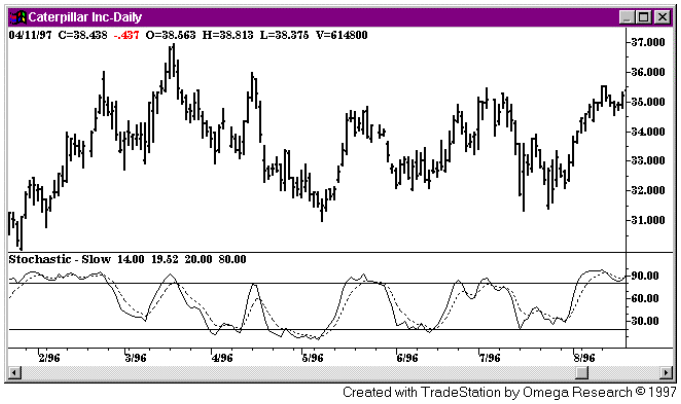


Chart 4

TradeStation EasyLanguage
Indicator: Stochastic Slow

```
Input: Length(14),BuyZone(20),SellZone(80);

Plot1(SlowK(Length),"SlowK");
Plot2(SlowD(Length),"SlowD");
Plot3(BuyZone,"BuyZone");
Plot4(SellZone,"SellZone");
```

VOLATILE MARKET

A volatile market is characterized by sharp jumps in price. Chart 5 is a weekly chart of American Software. You will notice that this type of market action involves a quick and unexpected change in volatility. At the marked points on this chart, AMSWA was quiet for the previous 7 to 15 weeks. Then the price leaped out of this low volatility trading range. This is what is commonly called a "volatility expansion."

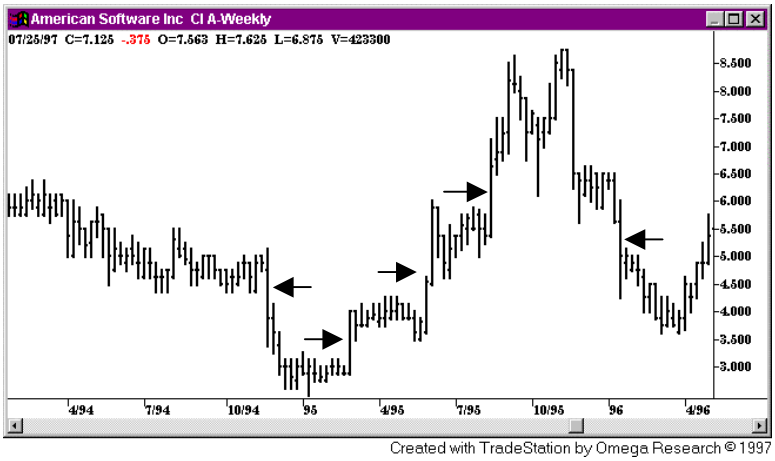


Chart 5

Volatility Expansion Examples

Long → Short ←

The volatility of the market increased substantially during the breakout week as it shot out of the previous range. Strategies can be designed to take advantage of this type of change in volatility. They are generally called Volatility Expansion Strategies.

Volatility expansion strategies profit from market action like the movement depicted in the AMSWA chart. Basically, the strategy measures recent volatility and attempts to trade an immediate increase by buying an upside breakout with increased volatility or selling a downside breakout as the volatility increases.

Another measure of volatility might be the difference or spread between two moving averages—the spread increases with volatility. Price action, such as gap openings or an increase in the daily range, can also be considered an indication of an increase in volatility.

Three Strategy Types

Each of these three types of markets (Trending, Directionless and Volatile) are tradable, but with markedly different trading strategies. Let's take a look at each type of market behavior and the strategies that are appropriate to that type of market.

TREND FOLLOWING STRATEGIES

Like the name, trend-following strategies are designed for trending markets, and to take a position for all the big trending moves that may occur. In creating trend-following strategies, the number one priority is that the strategy must never miss the big move.

The easy way to accomplish this is to always be in the market, that is, to always be either short or long. If you always have a position, you will always be there when the big move takes place.

The other method is to always have a "stop" order in the market, resting either above or below the current price (this is the same order as a stop loss, but it is used to enter the market rather than exit). Using a stop to enter the market will protect you because if the market moves quickly in either direction, you will be stopped in before the big move begins.

I can't emphasize enough how important it is never to miss a big move in trend-following strategies. During the choppy, directionless phases of the market, you will experience several losses in a row and most likely significant drawdown. Therefore, if your strategy misses a big move, you may not have enough capital to hold out through the drawdown for the next big move.

Another design priority should be to limit your losses during the market's sideways mode. Notice how I said limit losses not make profits. It is very important to recognize that no strategy will make money in every market condition. It is therefore very important to identify the market action in which the strategy will make money and the market action in which it will lose money.

Once you have found the market action in which the strategy will lose money, it becomes a strategy design priority to minimize losses during that market action. If the strategy is designed to make money in a trending market, it will lose money in the choppy phase. Your priority should be to minimize the losses in the directionless market.

Many trend-following strategies make their money in one or two trades of the year and break even or lose money for the rest. The most common indicator used for trend following is moving averages, most often two, a short moving average and a longer moving average. Chart 6 of Disney shows the 9- and 18-period moving averages with TradeStation arrows indicating where a 9- and 18-period moving average crossover strategy would go long (up arrow) and short (down arrow).

Chart 6

TradeStation EasyLanguage Strategy: Moving Ave Cross

```
Input: Length1(9),Length2(18);

IF CurrentBar > 1 and
Average(Close,Length1) crosses
over Average(Close,Length2) Then
Buy on Close;

IF CurrentBar > 1 and
Average(Close,Length1) crosses
below Average(Close,Length2) Then
Sell on Close;
```

As you can see, there were periods of trend where a significant amount of money was made as well as periods where the market was choppy and the strategy whipsawed back and forth with losses.

Let's analyze what we've just learned. Most trend traders will tell you that the 80/20 rule works for trend trading: they make 80% of their profits on 20% of their trades. Even though the moving average strategy on Disney (Chart 6) made money over time, it was profitable only 39% of the time. That means that the strategy lost money 61% of the time. This is the difficult part of trend trading—a low percentage of winning trades. You need a lot of positive self-esteem and a lot of confidence in your abilities to trade a strategy that loses money on 60 or 65% of its trades.

We will talk about this issue again later, but you should be thinking now about the design of the strategy you would be able to trade. If you want to be a typical trend

trader, you should be prepared to lose money in a majority of trades. You should also be able to sit through significant drawdown as the market drifts through a directionless period.

The table below, SPF 1, is what I call a Strategy Parameter File. It is a summary of all the relevant information that I use to create a strategy with TradeStation. Each time I test a strategy in this book, I will use this so that you can see a description of a strategy in summary form and you have all the information to reproduce the results if you so desire.

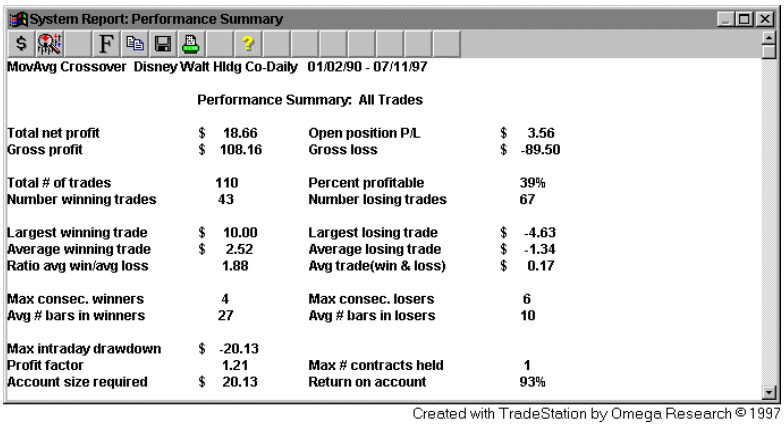
Strategy Parameter File Moving Average Crossover			
Set-Up	9/18 Moving Average Crossover		
Entry	None (market order)		
Stops	None	Exits	None
MaxBarsBack	50	Slippage	0
Margin	None Used	Commission	0
Data Source	(DIS) - Disney Stock - Omega Research CD		
Data Duration	1/2/90 to 7/11/97		

SPF 1

Note that under "Entries" I have put none. I do not consider a market order technically an Entry.

This is discussed in the next chapter, under the title, The Magic of Set-Up and Entry.

Look at the Performance Summary labeled PS 1. As I just asked you, could you sit in front of your computer screen and place losing trade after losing trade, waiting for the big move to come? Could you sit through a string of 6 or 7 losses in a row before the next profitable trade? Could you lose $20 per share in a string of losses?



System Report: Performance Summary

MovAvg Crossover Disney Walt Hldg Co-Daily 01/02/90 - 07/11/97

Performance Summary: All Trades

Total net profit	$ 18.66	Open position P/L	$ 3.56
Gross profit	$ 108.16	Gross loss	$ -89.50
Total # of trades	110	Percent profitable	39%
Number winning trades	43	Number losing trades	67
Largest winning trade	$ 10.00	Largest losing trade	$ -4.63
Average winning trade	$ 2.52	Average losing trade	$ -1.34
Ratio avg win/avg loss	1.88	Avg trade(win & loss)	$ 0.17
Max consec. winners	4	Max consec. losers	6
Avg # bars in winners	27	Avg # bars in losers	10
Max intraday drawdown	$ -20.13		
Profit factor	1.21	Max # contracts held	1
Account size required	$ 20.13	Return on account	93%

Created with TradeStation by Omega Research © 1997

PS 1

I do not include margin in my calculations as I personally look at return on Maximum Intra-day Drawdown or what I call ROMID. Margin can be placed in T-Bills to earn a risk free return. To add it to the account size thus becomes redundant.

Also, using different amount of margin needlessly complicates strategy performance comparison.

Note: *If you are unfamiliar with Performance Summaries (Strategy Report), please refer to Chapter 8, The Science of Strategy Evaluation.*

As you can see from PS 1, the maximum number of consecutive losers was 6 and the maximum intra-day drawdown (MAXID) was $20.13. That means that at least once, from 1990 to 1997, you would have placed six losing trades in a row and had a cumulative loss of over $20 per share. Could you realistically put up with this?

Another characteristic of a trend-following strategy is that it makes most of its profits in one or two big trades. Of the $18 profit in Disney, $10 came from one trade over the six years of data. This is not unusual for a trend-following strategy. I discuss how much profit you should permit to come from the largest profitable trade in Chapter 8, The Science of Strategy Evaluation.

Many researchers have estimated that any market is in the trend mode 15% of the time and is directionless 85% of the time. A trend-following strategy then, by definition, has a low percentage of profitable trades. A trend-following strategy is psychologically difficult to trade, but if you think you can successfully trade without constant positive feedback, it can prove to be very profitable.

Trend-following strategies are probably the most popular type of strategy. With a high percentage of losing trades, you might be wondering why is it so popular. Very simply, trend-following strategies can be very profitable over time. Another reason is that people like to follow (and make money on) the big trends. It is human nature to want to cash in on the big moves in the market. It is innately satisfying to get in early on a trend and watch your profits soar.

SUPPORT & RESISTANCE STRATEGIES

The main focus of a Support and Resistance (S/R) strategy is to profit from the price swings that occur in directionless markets. The strategy attempts to capture price movement opposite to that captured by trend-following strategies.

Support and resistance strategies start with the premise that markets are directionless 85% of the time. The strategy attempts to take advantage of this price movement and catch the small swings that take place in sideways or choppy markets.

This type of strategy has a higher number of winning trades, with small profits on each trade. It misses the full trend because it exits early in the trend move as the market becomes quickly overbought or oversold.

An S/R strategy is built on the concept of buying low and selling high. As you are buying when prices are low and selling when prices go up, you are actually trading against the trend. Essentially, you are attempting to pick tops and bottoms. You buy low and sell high, but the market keeps going higher. You keep selling as the market goes higher, and keep taking small losses until the market finally turns down and gives you a profitable trade.

Although an S/R strategy is easier to trade emotionally, many traders don't trade this type of strategy because they miss the big move (by design). The most common indicator used with a support/resistance type of strategy is probably the Stochastic Oscillator.

You can see the Stochastic Indicator on Chart 7 of Caterpillar. I also applied the Stochastic Crossover strategy I created based on this indicator, highlighted in SPF 2.

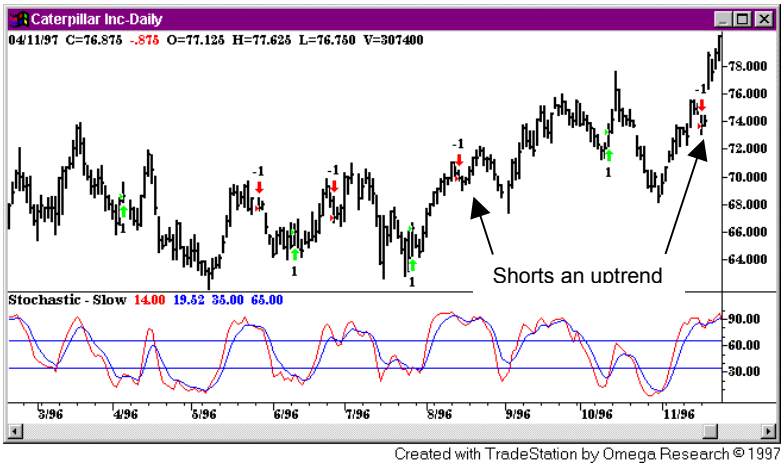


Chart 7

TradeStation EasyLanguage Strategy: Stochastic Cross

Input: Length(10);

IF CurrentBar > 1 and SlowD(Length) < 35 and SlowK(Length) crosses above SlowD(Length) then Buy on Close;

IF CurrentBar > 1 and Slowd(Length) > 65 and SlowK(Length) crosses below SlowD(Length) then Sell on Close;

Notice how the indicator fluctuates between 0 and 100. In this case, I used the 65 line and the 35 line to represent overbought and oversold, respectively. The overbought level for the stochastic is generally between 65 and 90 and the oversold level is between 35 and 10. You can play around with these levels to find the ones that make the most sense for you.

I have designed an S/R strategy so that when the Stochastic (SlowD) is below 35 and the short average (SlowK) moves above the long average (SlowD), the strategy produces a buy signal. The opposite would be true for a short signal, SlowD is above 65 and SlowK crosses below SlowD.

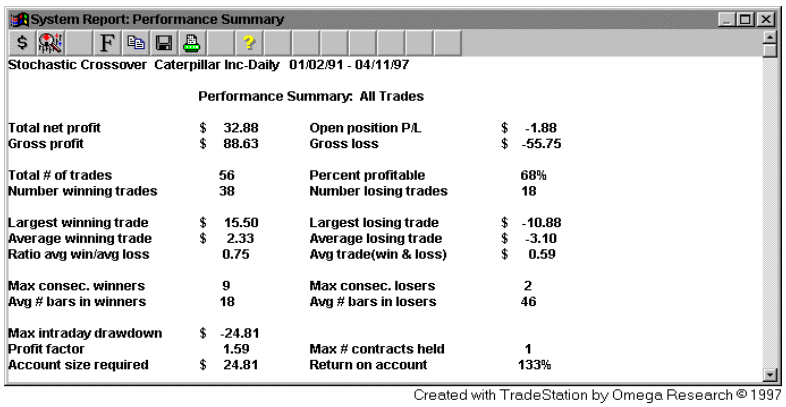
Strategy Parameter File Stochastic Crossover			
Set-Up	SlowD < 35 or SlowD > 65		
Entry	SlowK crosses SlowD		
Stops	None	Exits	None
MaxBarsBack	50	Slippage	0
Margin	None Used	Commission	0
Data Source	(CAT)Caterpillar Stock - Omega Research CD		
Data Duration	1/2/91 to 4/11/97		

SPF 2

Note that in this test I have both a Set-Up and an Entry. Again, the magic of Set-Up and Entry is discussed in the next chapter.

The drawback of support and resistance strategies is that they usually have small profits and larger strings of losses as they lose money when the market trends. By design, the strategy keeps shorting a market that is in an uptrend, or buying a market that is a downtrend.

You can see this happened twice in Chart 7 (previous page). Both times the market was in a sustained up-trend and when the Stochastic set-up reached overbought (above 65), the strategies went short. The market then kept moving up, resulting in losing trades.



PS 2

Note that the average losing trade is greater than the average winning trade. The strategy was ultimately profitable because of the high percentage winners.

As you can see from Performance Summary PS 2, this strategy has a high percentage of profitable trades (68%). This high percentage is needed to be profitable overall because the average losing trade was close to 1/3 larger than the average winning trade. Observe also that the strategy only had two consecutive losses in a row, which makes it much easier to trade from a self-esteem standpoint. The maximum intra-day drawdown (MAXID) was very large as a

percentage of the net profit (76%). This would have to be fixed before this strategy would be ready to trade. I'll show you techniques for fixing problems like this in the following chapters.

Keep in mind that, while strategy development looks easy, it is not. CAT was in a choppy market during this time whereas the stock market was in a strong bull market. If you had traded our moving average crossover trend-following strategy on CAT during this time, you would have lost a significant amount of money thinking that CAT would trend with the overall market.

An S/R strategy is designed to buy low and sell high, which is an easy method psychologically to trade because it makes logical sense. However, these strategies can lose money in the long run. Generally, most successful strategy traders don't trade this type of strategy. If S/R strategies are used at all, it is to complement a group of strategies that includes trending strategies and perhaps a volatility strategy or two.

VOLATILITY EXPANSION STRATEGY

Volatility expansion strategies are designed to do well in volatile markets. The trades generated by this type of strategy are usually short-term, and when trading this type of strategy, you will be out of the market a significant amount of time. Volatility expansion strategies generate a high percentage of winning trades, although these trades usually generate small profits per trade. The S&P futures is a market that I would characterize as "volatile." Neither trend-following strategies nor S/R strategies work particularly well on the S&P.

Chart 8 is a daily S&P futures chart from December of 1996 through March of 1997. Using a ShowMe Study, I had TradeStation highlight the gaps by placing large crosses on the opening price on the day on which the gap occurred.

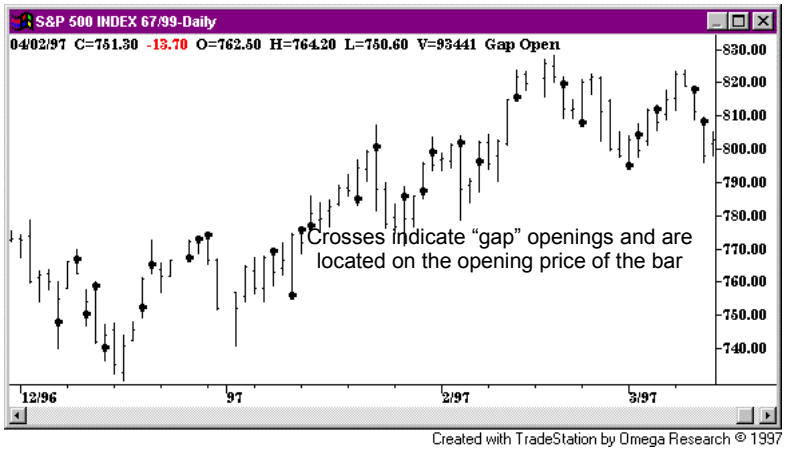


Chart 8

TradeStation EasyLanguage Show Me: Gap Open

```
If Open of this bar > High[1]
then Plot1(Open of this
bar,"Gap Up");

If Open of this bar < Low[1]
then Plot2(Open of this
bar,"Gap Down");
```

One characteristic of a volatile market is gaps. Gaps refer to places in a bar chart where there is no continuity or overlapping of price. In this case, I have defined a gap as existing when today's open is either above the high of yesterday or below yesterday's low. Chart 8A is a small chart with two examples of up gaps.

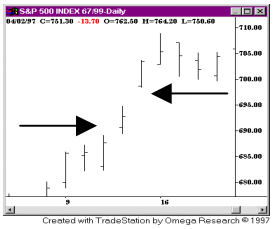


Chart 8A

In both cases, the open gapped up over the high of the previous day, and was unable to fill the gap created between the opening price and the previous day's high. In most cases, as you can see on Chart 8, the prices fill the gap created on the open. In either case (whether the gap is filled or not) this type of chart action usually indicates an increase in volatility, or volatility expansion. A volatility expansion strategy could be designed to take advantage of market movement such as this.

As you can see from the marks on the S&P in Chart 8 (previous page), gaps appear to indicate that the market makes substantial daily moves following an opening gap. Let's try to capture this movement with a strategy that is designed to profit from opening gaps and subsequent movement.

Let's assume that if the market gaps up it is going to continue to go up, and if it gaps down it is going to continue to go down. The up or down gap sets up the trade. We then need to figure out how we are going to enter the market once the set-up occurs. I think we should require that the market move a significant amount away from the opening price before we enter the market.

Strategy Parameter File Gap Up/Down Volatility Increases			
Set-Up	Gap Opening		
Entry	Moves away from yesterday's close an amount equal to yesterday's range		
Stops	None	Exits	Next Day's Open
MaxBarsBack	50	Slippage	None
Margin	None Used	Commission	None
Data Source	S&P Futures - Omega Research CD		
Data Duration	1/1/90 to 4/2/97		

SPF 3

The exit is on the next day's open. If we have a gap day and we get long or short, the strategy holds overnight and exits on the first trade of the following day.

This strategy enters when the price action moves up or down an amount equal to yesterday's close plus or minus yesterday's range. The idea is that in addition to the price gap on the opening, we will require the price to move a distance at least equal to the previous day's range away from the previous day's close. This adds a second condition, assuring that volatility actually does expand. The strategy is applied to a daily S&P futures chart in Chart 9.

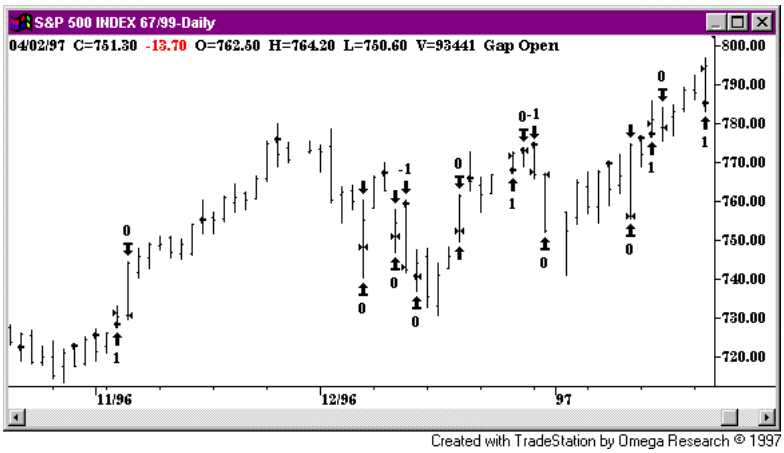


Chart 9

TradeStation EasyLanguage Strategy: Gap Open

IF Open of next bar > High of this bar or Open of next bar < Low of this bar then Buy next bar at Close of this bar + Range of this bar Stop;

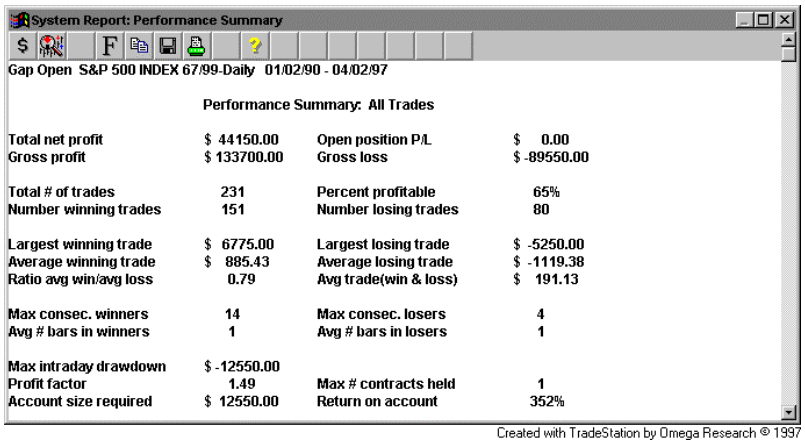
IF Open of next bar < Low of this bar or Open of next bar > High of this bar then Sell next bar at Close of this bar - Range of this bar Stop;

Exitlong next bar at market;
Exitshort next bar at market;

The results of this strategy are pretty good for the first try. This is definitely something that we can work with. There are many additions and variations that could improve the strategy. We might work on different exits, money management stops, and profit targets. We might also work on different ways of entering the market after a gap occurs. The results in PS 3 indicate that this price movement has real potential for creating a viable strategy.

As you can see in PS 3, the profits from a volatility expansion strategy come from a high percentage of profitable trades. Even though the average winning trade was less than the average losing trade, we still had the makings of a profitable strategy.

I hope you also noticed that in this test, as in all the previous tests in this chapter, I did not include any costs for slippage and commission. If, for instance, we included $25 for commission and $75 for slippage, the average trade profit would be $91.13 instead of $191.13. In strategies that have a lot of trades, these costs can make the difference between a strategy you would trade and one you would not.


System Report: Performance Summary

Gap Open S&P 500 INDEX 67/99-Daily 01/02/90 - 04/02/97

Performance Summary: All Trades

Total net profit	$ 44150.00	Open position P/L	$ 0.00
Gross profit	$ 133700.00	Gross loss	$ -89550.00
Total # of trades	231	Percent profitable	65%
Number winning trades	151	Number losing trades	80
Largest winning trade	$ 6775.00	Largest losing trade	$ -5250.00
Average winning trade	$ 885.43	Average losing trade	$ -1119.38
Ratio avg win/avg loss	0.79	Avg trade(win & loss)	$ 191.13
Max consec. winners	14	Max consec. losers	4
Avg # bars in winners	1	Avg # bars in losers	1
Max intraday drawdown	$ -12550.00		
Profit factor	1.49	Max # contracts held	1
Account size required	$ 12550.00	Return on account	352%

PS 3

Note that the high percentage of profitable trades compensates for the higher average losing trade. The largest winning trade is a small percentage of the total profits.

Price explosions of one form or another characterize a volatile market. One way of defining a price explosion would be a "gap" opening, another would be an increase of "range" (high-low). Some indicators have been developed to try to indicate a change in volatility. One of these is actually called "volatility" and is included as a study in TradeStation.

Typical volatility expansion strategies measure current volatility and enter the market when there is an abrupt increase in volatility. This type of strategy makes a quick exit, usually after only a few bars.

Selecting a Market and Strategy Type

You should now have an idea as to the different types of market action and the strategy characteristics that attempt to take advantage of the action and profit from it. Each type of market has unique characteristics and takes a different thought process for strategy design.

In your own thoughts, you should begin to think about what type of market you are most comfortable with and would like to trade. Another consideration is the financial and statistical characteristics of the strategies, with specific regard as to whether you could actually trade the strategy. It is not wise to create a great strategy that would be psychologically impossible for you to trade.

The first step in strategy design is to think about the characteristics of the three market types and the strategies that are effective for each. Then decide what type of trader you are, or want to be: a trend trader, who buys low and sells high, or a volatility trader, who takes selective but high percentage trades.

I don't want to tell you what kind of strategy you should use. Everyone has to decide for him or herself, based on their personality and trading preferences. I think the best way to choose a strategy is to take a look at Table 1.

You should determine what type of strategy is best for your temperament. There are successful strategy traders using each type of strategy, but based on my experience, a higher number of traders use trend-following and volatility expansion strategies than support and resistance strategies.

Table 1	Trend	S /R	Volatility
Time in the market	Always in the market	Not always in the market	A substantial amount of time out of the market
Winning trades	Small percentage of winning trades	Higher percentage of winning trades	High percentage of winning trades
Where is money made	Money is made on big moves	Money is made in sideways markets	Money is made in market explosions
Where is money not made	Money is lost in choppy periods	Money lost in trending periods	Money is not made in quiet markets
Biggest con	Many false signals, long drawdown periods	Difficult to sustain profit over the long term	Never get the big move
Biggest pro	Possibility of high profits	Higher percentage of profitable trades	High percentage of profitable trades
Profit	Average profit per trade high over long term, unlimited	Limited average profit per trade	Small profit per trade, limited
Philosophy	Buy high and exit higher, sell low and exit lower	Buy low and sell high	Very quick and short term trades
Emotional	Long sustained drawdown periods can be difficult	Easier to trade because you are buying low and selling high	Exciting to trade - trades are short-term
Type of Indicators used	Moving Average, ADX, price bands and channels	RSI, %R, Stochastics, Support/Resistance lines	Purely based on price

Choosing a Time Frame

After you select the strategy type you want to use, you need to think about the time frame in which you want to trade, and therefore the type of data you want to collect. There are three general types of data you can collect: intra-day, daily, or weekly. Choosing the time frame that is appropriate for you is almost as important as the type of market action and strategy you want to trade.

The most common chart used by traders is the daily chart, and this is why I use daily charts for most of the examples in this book. Daily charts are the most common for several reasons. Because most traders also have day jobs, they want to keep abreast of the market as much as possible without it intruding into their workday. The daily chart is perfect for this type of trader. You are able to review the markets each night and make your decisions for the next day.

WEEKLY VS. DAILY CHARTS

Weekly charts are much more difficult to trade because it takes more discipline. To trade weekly charts, you must make your decisions on the weekends and not make any changes until the next weekend. For most traders, this is very difficult to do. It is very easy to yield to temptation and move a stop loss or a money management stop, or want to keep your profits and exit the market early.

To discipline yourself not to look at the market during the week is a tough thing to do. Most people don't think of trading weekly charts. My experience is that there is a lot of money to be made trading weekly charts, simply because so few traders are able to do so. To make money in the markets, you have to tread where the average traders do not tread. Weekly charts are one of those places.

Chart 10 shows the weekly S&P futures in the upper box and the daily S&P in the lower.

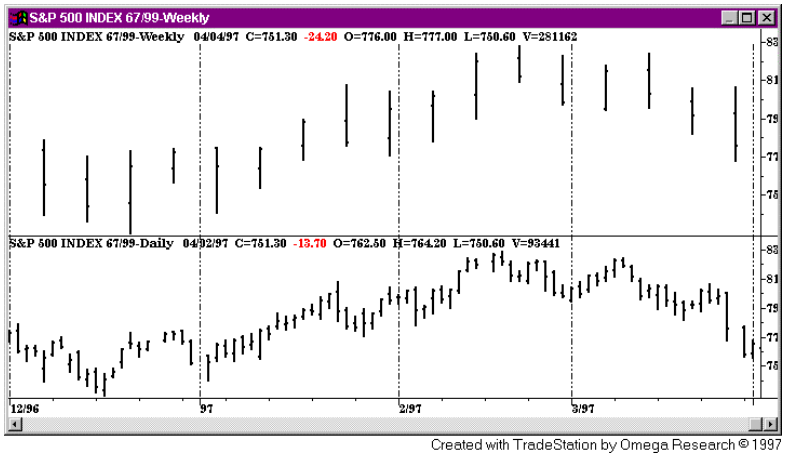


Chart 10

The top chart is a weekly chart and the bottom is a daily chart of the S&P futures.

There is more price detail in the daily chart, but also more price noise. Let's check out a simple strategy on both the daily and weekly charts.

Chart 11 is a daily IBM with a 50-period channel. The 50-period channel marks the highest high of the last 50 bars and the lowest low of the last 50 bars. The strategy would go long if the close of the bar closed above the channel and sell short if the price closed below the lowest low of the last 50 bars.

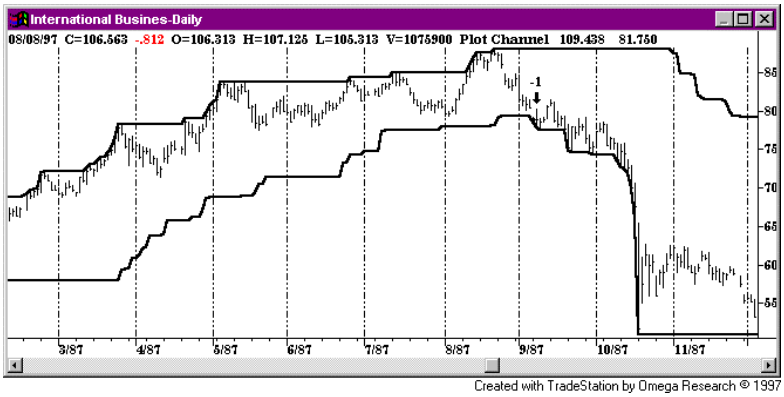


Chart 11

TradeStation EasyLanguage Indicator: Plot Channel

```
Input: Length(50);

Plot1(Highest(High,Length),"Channel");
Plot2(Lowest(Low,Length),"Channel");
```

Chart 11 shows IBM up to and including the crash of 1987. The first thing you should notice is that this strategy is always in the market, i.e., it is either long or short. I arbitrarily chose the 50-period channel for this test. I will then compare the results with the same length channel on a weekly chart.

In these tests, I will assume that 50 days is about equal to 10 weeks. So, to compare a daily strategy with a weekly strategy, we will use the same lengths in time although measuring the length on daily charts in days (50) and on weekly charts in weeks (10).

Let's take a look at how a simple channel breakout strategy works, first on a daily chart, then on a weekly. Our working premise is that the strategy will be more profitable on weekly charts than on daily.

Ask yourself why should a strategy, basically the same strategy, work better on a weekly chart than on a daily. I can come up with several reasons. First, very few people have the patience and the discipline to trade weekly charts. Second, by their very nature weekly charts smooth the price fluctuations of the daily chart. If there is a long trending market, we should be in the trend longer. We might get in the trend a little later than on the daily chart, and out later, but we will probably not get whipsawed as much in the directionless markets.

I chose IBM again arbitrarily because it went through some frustrating choppy periods and some very fine trending periods in its action packed history since 1970. The Strategy Parameter File SPF 4 shows how we would design a strategy to test this theory.

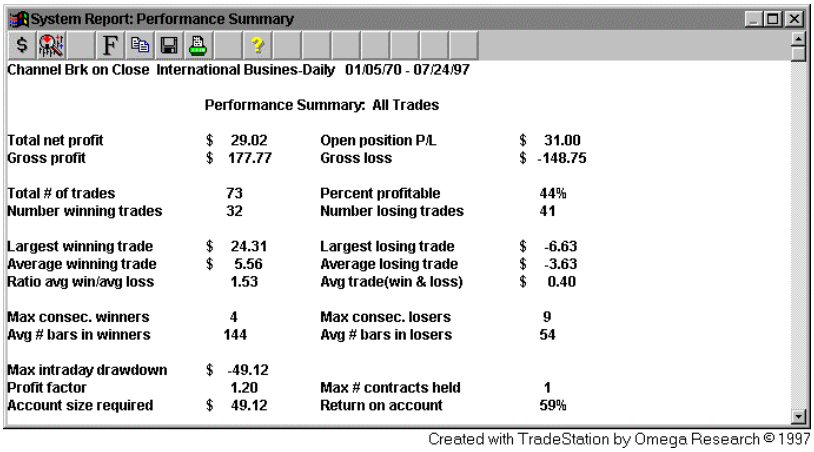
Strategy Parameter File Channel Breakout on Close			
Set-Up	50-Day Highest High and Lowest Low Channel		
Entry	Close above or below channel		
Stops	None	Exits	Reversal
MaxBarsBack	50	Slippage	35 cents/share
Margin	None Used	Commission	15 cents/share
Data Source	IBM Stock Daily – Dial Data		
Data Duration	1/5/70 to 7/24/97		

SPF 4

Note that in this test we have for the first time used a cost for slippage and commission. I assumed you would pay about $0.15 per share in commissions and we would have slippage of $.35 per share.

Slippage is the difference between the price of the order and the actual price at which you get filled.

Let's look at the results for the daily chart, shown in PS 4.



PS 4

TradeStation EasyLanguage Strategy: Channel Breakouts

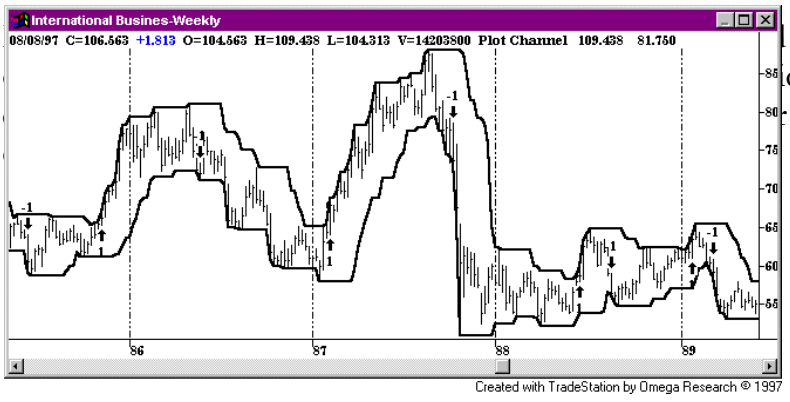
Input: Length(10);

IF CurrentBar > 1 and Close > Highest(High,Length)[1] Then Buy on Close;

IF CurrentBar > 1 and Close < Lowest(Low,Length)[1] Then Sell on Close;

This strategy was profitable over the 27 years. IBM moved from a low of 24 to a high of approximately 110, an 86 point rise. The strategy made $29 per share from 1970 to 1997.

Now let's look at the same indicator and strategy on an IBM weekly chart, Chart 12.



l strategy as the daily
ce that the only

Chart 12

TradeStation EasyLanguage Indicator: Plot Channel

Input: Length(10);

Plot1(Highest(High,Length),"Channel");
Plot2(Lowest(Low,Length),"Channel");

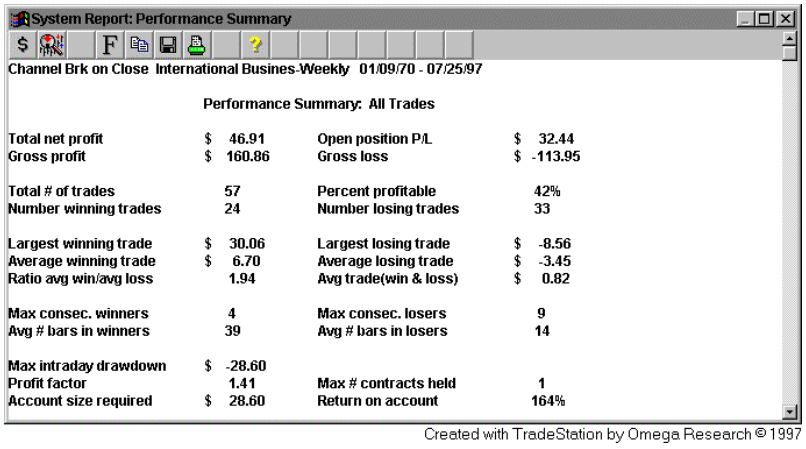
Strategy Parameter File Weekly Channel Breakout on Close			
Set-Up	10-Wk Highest High and Lowest Low Channel		
Entry	Close above or below channel		
Stops	None	Exits	Reversal
MaxBarsBack	10	Slippage	35 cents/share
Margin	None Used	Commission	15 cents/share
Data Source	IBM Stock Weekly – Dial Data		
Data Duration	1/5/70 to 7/24/97		

SPF 5

Note that in this test we have also used a cost for slippage and commission. I assumed you would pay about $0.15 per share in commissions and we would have slippage of $.35 per share.

Slippage is the difference between the price of the order and the actual price at which it is filled.

All else being equal, the strategies should perform about the same. However, as you can see in PS 5, in almost every category the weekly strategy outperformed the daily strategy.



PS 5

Note that there is a large open position profit of $32.44. This is the profit on the current trade and should be considered when comparing the two strategies.

Both strategies took their first trade within two days of April 22, 1970. From that point on, the weekly chart had a greater profit on fewer trades and less drawdown than the daily chart. The rest of the data is about the same. Clearly this data comes down on the side of the weekly chart rather than the daily.

This is just one very simple example of why you should consider weekly charts and not just assume that daily charts are your only option for trading.

INTRA-DAY VS. DAILY CHARTS

Intra-day charts are the 5-, 10-, 30-, and 60-minute charts that are compiled from intra-day tick data. To trade intra-day charts, you must give almost your full attention to the markets during the day.

It is virtually impossible to have a full-time job and trade intra-day charts well. As a percentage of traders, relatively few traders are able to trade during the day. I think it is for this reason that there is significant money to be made trading intra-day. The relative lack of competition has to be in your favor trading intra-day. Chart 13 is an example of a 30-minute S&P futures chart placed on top of a daily chart.

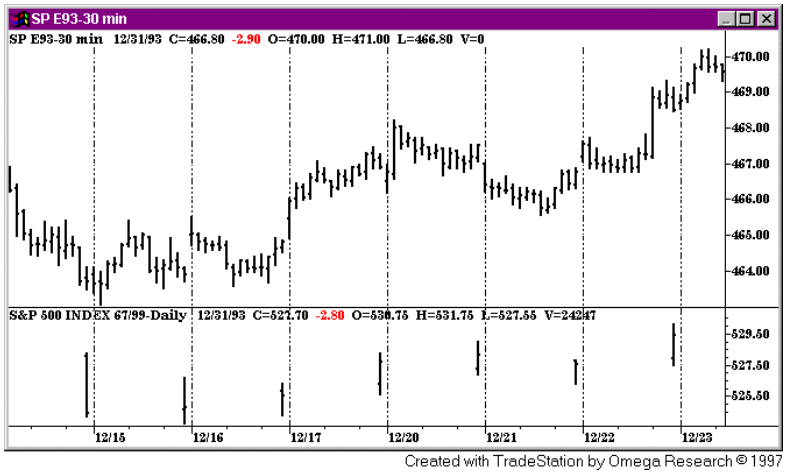


Chart 13

There are 14 intra-day bars in a 30-minute chart. However the last bar is only 15 minutes because it covers the time from 4:00 to 4:15pm (EST).

The top chart is a 30-minute chart and the bottom is a daily chart.

Trading intra-day data permits you to put a microscope on daily activity and filter trades so that you can take advantage of the intra-day timing. I want to show you the benefits of looking at a technique and strategy through the intra-day microscope.

To do so, let's analyze a technique that I taught in my seminars many years ago. I called it a RangeLeader Breakout. A range leader is a special type of bar that has two attributes. The first is that the range of the bar must be greater than the range of the previous bar. Range is defined as the bar's high minus the bar's low.

The second characteristic of a range leader is that the midpoint of the bar must be above the previous bar's high or below the previous bar's low.

Range Leader Bar

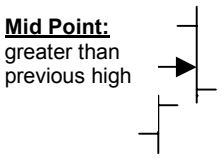
The mid-point is greater than the high of the previous bar

Or

The mid-point is less than the low of the previous bar

And

The range (high - low) is greater than the range of the previous bar



So let's create a strategy using the range leader. And make it simple. If a range leader occurs today, on the current bar, we will buy tomorrow one tick over the high of the range leader, or we will sell one tick below the low of the range leader. That's about as simple as I can conceive it.

The daily chart of the S&P with both the ShowMe Study and the RangeLeader Breakout strategy on TradeStation is shown in Chart 14.

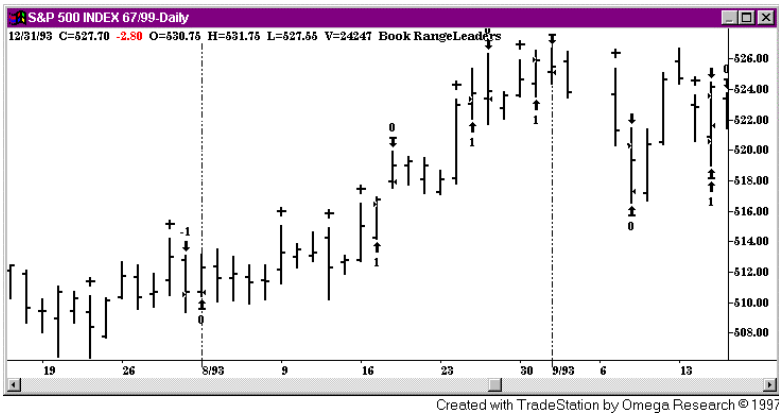


Chart 14

TradeStation EasyLanguage ShowMe: RangeLeaders

```
If RangeLeader = 1 then Plot1(High +
100 points,"RangeLeader");
```

TradeStation EasyLanguage Function: RangeLeader

```
Vars : Value1(0), Cond1(False),
Cond2(False);
Value1 = (High + Low) / 2 ;
Cond1 = Value1 > High[1] OR
Value1 < Low[1] ;
Cond2 = Range[0] > Range[1] ;
If Cond1 and Cond2 then
RangeLeader = 1 else
RangeLeader = 0;
```

What type of a strategy is this? Trend-following, support and resistance, or volatility expansion? This the first question you should ask yourself as you look at this or any other strategy. In this case, since we're looking at a breakout based on the previous bar's range, it is a volatility expansion strategy.

The Strategy Parameter File is shown in SPF 6.

Strategy Parameter File
RangeLeader Breakout

Set-Up	RangeLeader		
Entry	Breakout Next Bar		
Stops	$500 MMS	Exits	Next day on open, $1,500 PT
MaxBarsBack	2	Slippage	$35
Margin	None Used	Commission	$25

SPF 6

TradeStation EasyLanguage Strategy: Daily RL Breakouts

```
If  RangeLeader = 1 then
begin
  Buy at High + 1 point stop;
  Sell at Low - 1 point stop;
end;

Exitlong next bar on Open;
Exitshort next bar on Open;
```

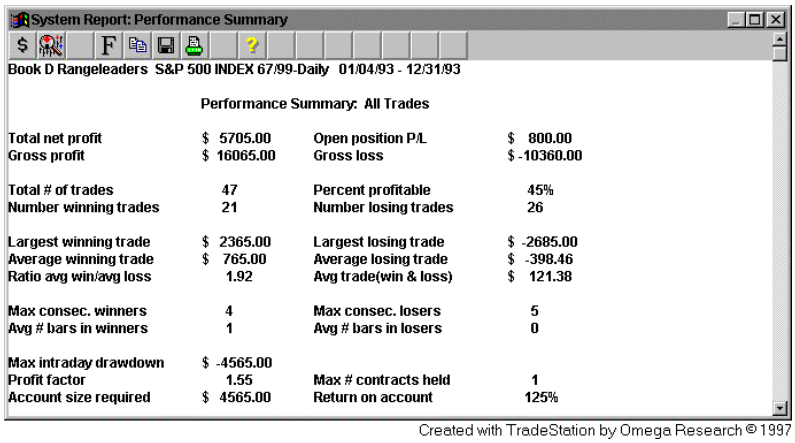
Data Source	S&P Futures Daily – Omega CD
Data Duration	1/1/93 to 12/31/93

Note that this strategy introduces the concept of Money Management Stops ("MMS") and Price Targets ("PT"). An MMS is an order you place in the market to conserve your capital. In this case I decided I did not want to risk more than $500 per trade. The strategy design therefore includes a provision that when it gets filled, it immediately puts a stop loss $500 away from the entry price.

Price targets are placed if you want to exit the market at a particular profit level. This, of course, limits your profit per trade. In this case, I decided that if the price moved $1,500 in my favor, I would take the profit. For this strategy, I arbitrarily decided on the $500 MMS and $1,500 PT amount, but if we want to we can use TradeStation to test for the optimum amount for both of these.

For the exit, if my price target was not hit, that is, I did not make the $1,500, I decided that I would want to get out a soon as possible. I had two choices as to how to exit: on the close of the entry bar or the next day on the open. I chose the next day on the open as I wanted to take advantage of possible gap opens. I could also test other options for exiting the market. So, if I did not make $1,500 on the day the strategy entered the market, I would exit the following day on the open. This strategy was not too bad right out of the box.

The Performance Summary for this strategy is shown in PS 6.



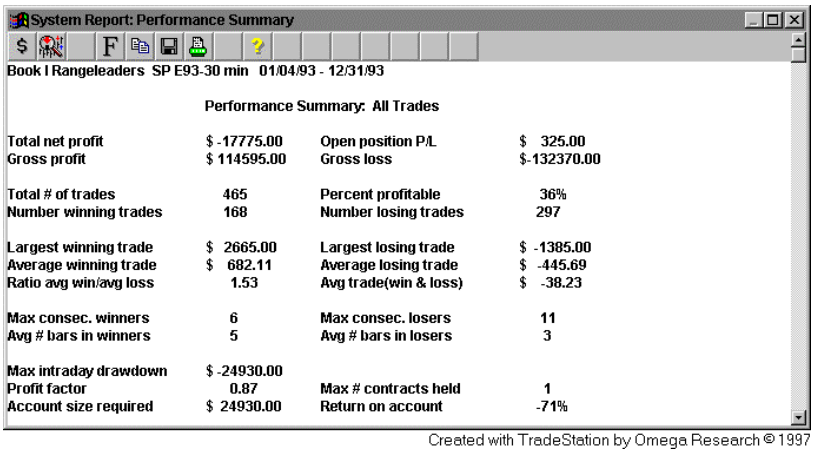
PS 6

Note that our largest winning and losing trades were greater than our money management stop and profit target.

This happened because our stop and target were not always hit. The next day the price gapped and we exited on the open. The gap was beyond either our stop loss or our price target.

We made 125% return on our drawdown in one year. All in all, not a bad first try.

Are we able to improve on this basic strategy by using the microscope of intra-day charts? Let's try using a 30-minute chart and see what we find. The Performance Summary results are shown in PS 7.


System Report: Performance Summary

Book I Rangeleaders SP E93-30 min 01/04/93 - 12/31/93

Performance Summary: All Trades

Total net profit	$ -17775.00	Open position P/L	$ 325.00
Gross profit	$ 114595.00	Gross loss	$-132370.00
Total # of trades	465	Percent profitable	36%
Number winning trades	168	Number losing trades	297
Largest winning trade	$ 2665.00	Largest losing trade	$ -1385.00
Average winning trade	$ 682.11	Average losing trade	$ -445.69
Ratio avg win/avg loss	1.53	Avg trade(win & loss)	$ -38.23
Max consec. winners	6	Max consec. losers	11
Avg # bars in winners	5	Avg # bars in losers	3
Max intraday drawdown	$ -24930.00		
Profit factor	0.87	Max # contracts held	1
Account size required	$ 24930.00	Return on account	-71%

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PS 7

TradeStation EasyLanguage
Strategy: ID RL Breakouts

```
Condition1 = Time <> Sess1StartTime;
Condition2 = Time <> Sess1EndTime;
If Condition1 and Condition2 and
RangeLeader = 1 then begin
   Buy at High + 1 point stop;
   Sell at Low - 1 point stop;
end;
If Time = 1615 then begin
   Exitlong next bar on Open;
   Exitshort next bar on Open;
end;
```

This obviously didn't work. We simply put the same strategy for the daily chart on the 30-minute chart (with one small change). The Strategy Parameter File is shown in SPF 7.

Strategy Parameter File
RangeLeader Intra-Day Breakouts

Set-Up	RangeLeader 30-Minute Breakouts		
Entry	Breakout Next Bar		
Stops	$500 MMS	Exits	Next day on open, $1500 PT
MaxBarsBack	2	Slippage	$35
Margin	None Used	Commission	$25
Data Source	S&P Futures 30-Minute charts – Tick Data		
Data Duration	1/1/93 to 12/31/93		

SPF 7

TradeStation EasyLanguage
Strategy: ID RL Breakouts

```
If RangeLeader = 1 then begin
  Buy at High + 1 point stop;
  Sell at Low - 1 point stop;
end;

If Time = 1615 then begin
   Exitlong next bar on Open;
   Exitshort next bar on Open;
end;
```

Again, the strategy entered on RangeLeader Breakouts with a $1,500 PT and a $500 MMS. This time it lost some money. Let's look at the minor change I made to it and then think for a moment about what went wrong.

An important consideration for this strategy, as with any intra-day strategy, is the first and last bar of the day. If the first bar of the day is a range leader, this means that the range of this bar is greater than the range of yesterday's last 30-minute bar, and that the mid-point of this bar is either greater than the high or less than the low of the last bar yesterday. I have always thought that with the intervening time, this information was meaningless and shouldn't be used to trade.

Therefore, I added a Condition1, which eliminates the first bar from use (Sess1StartTime). Notice that I have also eliminated the last bar of the day (Sess1EndTime). If the last bar of the day is a range leader, the breakout will occur tomorrow during the opening bar. The fact that the last bar of the day is a range leader is irrelevant to tomorrow's first bar, and the breakout is meaningless. Condition1 and Condition2 in the TradeStation EasyLanguage for this strategy deal with these issues.

Now, let's look now at what went wrong. I believe the reason that the strategy lost money on the intra-day chart is because we didn't take advantage of the strengths of using intra-day charts. It stands to reason that there must be certain times of the day when the market moves and other times when it rests. We simply used each 30-minute bar as if it was no different than any other bar. I have always thought that there were different times of the day that are more important.

Perhaps we should test each individual bar for a RangeLeader Breakout and then put in our MMS and PT and exit on tomorrow's opening price if we don't reach our target or get stopped out.

There are 13 30-minute bars during the day, and a 14th bar which is the last 15 minutes between 4:00 and 4:15pm (EST). I changed the strategy to test each bar, designated by its ending time, for a RangeLeader Breakout, using a $1,500 PT and a $500 MMS. If neither the MMS nor the PT is hit, we then exit the next day on the open. A summary of the results for each 30-minute intra-day bar is shown in PS 8.

Time	Profit	Long	Short	Ave Trade

10:00	-1400.00	1205.00	-2605.00	-11.67
10:30	-2625.00	-2160.00	-465.00	-105.00
11:00	4080.00	-1525.00	5605.00	151.11
11:30	-4700.00	-400.00	-4300.00	-156.67
12:00	-2800.00	3750.00	-6550.00	-112.00
12:30	1990.00	-430.00	2420.00	43.26
13:00	-5005.00	-3020.00	-1985.00	-116.40
13:30	-4230.00	-1410.00	-2820.00	-111.32
14:00	-10835.00	-4030.00	-6805.00	-235.54
14:30	-5395.00	-1130.00	-4265.00	-94.65
15:00	**12225.00**	**5070.00**	**7155.00**	**188.08**
15:30	-1910.00	2545.00	-4455.00	-34.11
16:00	-2975.00	-860.00	-2115.00	-74.38

PS 8

TradeStation EasyLanguage Strategy: ID RL Time B/O

```
Input:Bartime(1500);

Condition1 = Time <> Sess1StartTime;
Condition2 = Time <> Sess1EndTime;

If Condition1 and Condition2
and Time = Bartime
and RangeLeader = 1 then begin
  Buy at High + 1 point stop;
  Sell at Low - 1 point stop;
end;

If Time = 1615 then begin
   Exitlong next bar on Open;
   Exitshort next bar on Open;
end;
```

PS 8 shows that there were only three time periods that produced profitable trades, 11:00, 12:30 and 15:00 (3:00pm). Clearly the 15:00 bar was the most profitable. It looks like we can conclude that most of the action in the S&P takes place after 3:00 in the afternoon.

Strategy Parameter File RangeLeader Intra-Day Breakouts			
Set-Up	RangeLeader at 15:00 bar		
Entry	Breakout Next Bar		
Stops	$500 MMS	Exits	Next day on open, $1,500 PT
MaxBarsBack	2	Slippage	$35
Margin	None Used	Commission	$25
Data Source	S&P Futures 30 Minute charts – Tick Data		
Data Duration	1/1/93 to 12/31/93		

SPF 8

TradeStation EasyLanguage Strategy: ID RL Breakouts

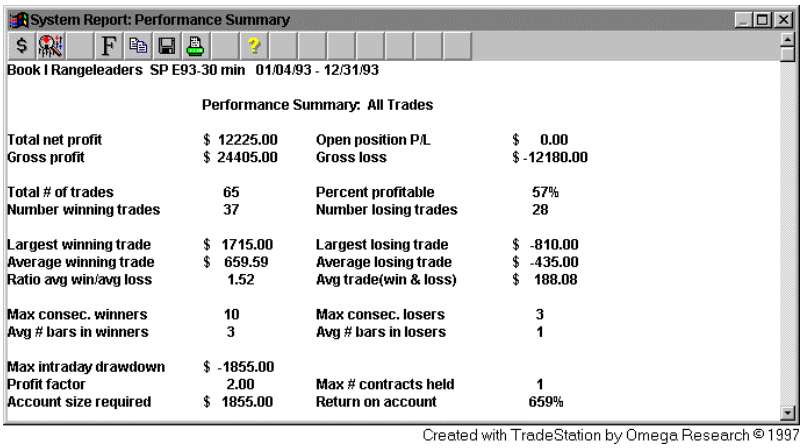
```
Input:Bartime(1500);

If Time = Bartime and
RangeLeader = 1 then begin
  Buy at High + 1 point stop;
  Sell at Low - 1 point stop;
end;

If Time = 1615 then begin
   Exitlong next bar on Open;
   Exitshort next bar on Open;
end;
```

SPF 8 shows a summary of the final design of the 3:00 intra-day RangeLeader Breakout. Key elements of this strategy are the time of day, the $1,500 profit

target, the $500 money management stop, and the exit on the open of the following day if neither of the stops are hit. PS 8A shows the whole Performance Summary using only the 15:00 bar as the RangeLeader Breakout.



System Report: Performance Summary

Book I Rangeleaders SP E93-30 min 01/04/93 - 12/31/93

Performance Summary: All Trades

Total net profit	$ 12225.00	Open position P/L	$ 0.00
Gross profit	$ 24405.00	Gross loss	$ -12180.00
Total # of trades	65	Percent profitable	57%
Number winning trades	37	Number losing trades	28
Largest winning trade	$ 1715.00	Largest losing trade	$ -810.00
Average winning trade	$ 659.59	Average losing trade	$ -435.00
Ratio avg win/avg loss	1.52	Avg trade(win & loss)	$ 188.08
Max consec. winners	10	Max consec. losers	3
Avg # bars in winners	3	Avg # bars in losers	1
Max intraday drawdown	$ -1855.00		
Profit factor	2.00	Max # contracts held	1
Account size required	$ 1855.00	Return on account	659%

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PS 8A

This strategy is a 3:00 RangeLeader breakout on 30-minute charts with a $500 money management stop and a $1500 profit target.

As you can see in PS 8A, the results of using 30-minute bars and only using the 15:00 bar the RangeLeader Breakout strategy were very good. In 1993, it produced a return on maximum intra-day drawdown (MAXID) of 659% with 57% profitable trades. In every category, this strategy outperformed the daily chart.

Keep in mind that this is only for 1993. Before I would get overly excited about this strategy, I would test this in other years as well.

So, after all of this information, what's the point? The point is that intra-day data, if used correctly, can give you a distinct advantage over daily charts. If you have the time and energy, you can take advantage of the microscopic look at the markets using intra-day charts, and you may be able to improve your return.

Summary

Let's recap what we have covered in this chapter. First, we took a look at the three types of markets: trending, directionless and volatile. We noted their individual characteristics and how to recognize each of them.

Next we studied strategies that take advantage of the three different types of market action. First, we looked at trending markets and the trend-following strategies that attempt to profit from this type of market. We saw that this type of strategy tries to catch the big move, and usually loses money while it waits for the trend. Trend-following strategies take trades with a low probability of profit, with

the eventual profitable trade usually being a big winner, covering all of the losses and more.

We then looked at both support and resistance strategies and volatility expansion strategies and noted their characteristics. Generally, these strategies are designed to intentionally miss the big trend. They attempt to make money by entering trades that have a high probability of success, but have limited profits. S/R strategies buy low and sell high. Volatility expansion strategies capture an increase in volatility and profit from this short-term explosion in price.

We then looked at the different time frames available for the strategy trader. I noted that most people instinctively trade daily charts. However, the successful strategy trader looks at the time frames that will maximize profits, not necessarily those that are most convenient. We compared the same strategy on the same data on both a daily chart and a weekly chart, and found that in this case the weekly results were much better than the daily. While this won't be the case for every strategy in every market, it makes the point that using weekly charts is something you should at least consider.

We then turned to intra-day charts. I hoped to show you that the same issue exists for intra-day charts. Are there markets and strategies that would be improved by using intra-day charts rather than daily? We found at least one instance where this was true, using my concept of range leaders for an S&P strategy.

Our first step was to test an indicator, the RangeLeader, and use it to develop a reasonable strategy on a daily chart. We then modified the daily strategy for intra-day data, eliminating the first and last intra-day bar. This didn't work. Undaunted, for the next step we decided to use the 30-minute intra-day data as a microscope to find the periods that did work with intra-day, 30-minute range leaders. For that reason, the last step was to test each of the individual bars to see which bars (if any) produced a viable strategy. We found the 1,500 bar to be very profitable and modified our strategy accordingly.

In this chapter, I hoped to show you that it is not necessary to be locked into trading daily charts. Although daily charts are the most common, and for most people the easiest to use, a case can be made that this is precisely the reason that you should consider trading other time frames. The decision rests on three factors: individual preference, personal discipline, and time.

The move to consider weekly charts involves some self-evaluation. Do you have the discipline to only look at the markets once a week? Can you effectively ignore market action during the week? In many markets, trading weekly charts can be a

big advantage; weekly charts tend to smooth out the price action, reducing many of the daily whipsaws into small insignificant corrections. This can be a distinct advantage for trend traders. I showed you one instance where using a weekly chart for a trend strategy was an advantage.

The intra-day time frame has its own advantages and disadvantages. First, you must have the time to watch the markets during the day. Second, you will probably be entering many more trades, and the cost of commissions becomes a larger factor. And third, the software and data costs are greater.

These are the first issues that you must consider as you begin to develop a strategy and trade it: the type of market, the strategy type and the time frame. Let's now move on to the major elements of creating the strategy itself.

Chapter 4: Profile of a Winning Strategy

At this point in the development of your strategy, you have a clearly defined direction in which you are heading. You've decided on the strategy type and market type you are going to trade, and you have a feel for the types of patterns on which you want to capitalize. Now is the time for a brainstorming session in which you should sit down in front of your computer with TradeStation. This is the point at which you start to develop the set of rules that actually make up your trading strategy.

Many traders at one time or another have become frustrated with strategy development. Not because they don't like it, but because they run out of new ideas to test, or haven't found anything that works for them.

For example, most traders have tested the Dual Moving Average Crossover Strategy sometime in their trading career. The average trader will look at this strategy and believe that the only thing to test is the length of the two averages. New traders will experiment with many different lengths for the averages. When they don't find any that work to their satisfaction, they discard the dual moving average strategy concept entirely, and move on to something else. They keep looking for that Holy Grail indicator that they can instantly make into a strategy. We have all been there, and have all discarded many great ideas.

The discarding of an idea, more often than not, is a mistake. I believe that for the most part, any indicator can be made into a profitable strategy. Yes, I said any indicator. When we discard the moving averages, it is usually a mistake because

the moving averages by themselves only represent one half of the strategy development puzzle. I refer to this half as the "Set-Up" of a strategy.

The second half of a strategy, the half that most traders ignore completely, is what I call the "Entry." In this chapter, I will talk about exactly what these two terms mean, and more important, how using them together can turn something as mundane as a moving average crossover into a promising new trading technique.

The Magic of Set-Up and Entry

My experience is that the secret to successful strategy development is to look at a method, or indicator, in an unconventional manner. The trick is to use it in a different and unique way.

With Set-Up and Entry, you will look at strategy development in a completely different way. As you'll soon see, it can provide you with a whole new world of exciting possibilities and ideas to test. It will lift you out of the rut of simply optimizing standard indicators and give you a method of organizing your creativity.

THE SET-UP

The Set-Up is the condition or set of conditions that are necessary prior to considering taking a position in the market. It is the indicator or group of indicators that tell you to *get ready* to buy or sell. Set-ups don't get you in the market, they simply make you aware that a trade is in the making.

Examples of set-ups for a trend-following strategy:

- A fast moving average crossing a slow moving average
- The ADX indicator in an up-trend
- Prices moving outside of a price channel

Examples of set-ups for a support and resistance strategy:

- The RSI moving into oversold territory (below 20) or into overbought territory (above 80)
- SlowD crossing SlowK when using the Stochastic Indicator
- Prices reaching the upper or lower line of a moving average envelope

Examples of set-ups for a volatility expansion strategy:

- An opening price gap over the high of the previous bar
- The current bar's range is greater than the average range of the last three bars
- The difference between two moving averages on the current bar is greater than the average difference of the last 10 bars

There are countless other indicators and conditions that could be used as set-ups. In the final analysis, you are limited only by your creativity. There is only one constraint that you should impose upon yourself. It is essential to recognize the type of strategy you are trying to develop and use the different indicators accordingly. You do not want to use a moving average crossover for a support and resistance strategy unless you are using it in a unique way. You would not choose to use the Stochastic Indicator for a trend-following strategy unless you had completely re-configured how it is used.

Most strategy traders do not recognize that these indicators only set up the trade. They are unaware that there are a multitude of ways to actually get in the market once the set-up has occurred. They are not aware that set-ups are only part of the equation and are not particularly profitable in and of themselves.

Beginning strategy developers get discouraged when they try to develop profitable strategies from set-ups only. They quickly run out of ideas to test, because they use up all their ideas as set-ups without trying to combine them with various complementary entries.

By trading only set-ups, you lose the added precision, accuracy and increased profitability of a strategy that uses both set-up and entry. If trading set-ups by themselves worked, and was profitable, trading would be easy and all traders would be rich.

THE ENTRY

An entry is the signal by which the strategy purchases the contract in the market. It is the technique that I use to take a market position once the rules for the set-up have been met.

Entry selection is dependent on the type of set-up you've designed. You may choose to trade a trend-following strategy, an S/R strategy, or a volatility

expansion strategy. The entries are designed differently depending on the type of strategy you choose to trade.

Many beginning traders devise strategies that only trade entries. These are not as effective and are usually less profitable than strategies that utilize both a set-up and an entry. Strategies based only on entries tend to have too many trades and a low percentage of profitable trades. There are two rules to which all entries must adhere:

Entry Rules:

1. **Prices should confirm the direction indicated by the Set-Up before a taking a position**
2. **The Entry should guarantee that a strategy will capture every price move for which it is designed**

Entry Rule #1 requires prices to move in the expected direction before entering the market. If our set-up indicates a long position, we would require the price action to move up in some specified manner before we would be comfortable taking a position. We want the price action to confirm the set-up and force us into taking a position.

For instance, let's assume that on today's close our set-up has given us a long signal. We might require a breakout above the high of today's bar to confirm that the market is in bullish mode. With this breakout as a condition of entry, we have now required specific market action in the direction of the set-up before we risk taking a market position.

Some examples of buy entries are:

- A buy stop on tick above the current bar's high
- A buy stop over the highest high of the last three bars
- Buy at market after several consecutive up closes
- Buy at market after a close over the previous bar's high
- Buy on a close that is greater than the open
- Buy on a stop, one tick above the last swing high
- Buy at the market on the close of a key reversal bar

Note: *Key reversals are a common and intriguing pattern. In an up key reversal the low of the current bar is lower than the previous bar's low and the close of the current bar is greater than the previous bar's close. In a down key reversal is the opposite. The theory is that this bar*

indicates an attempt by prices to continue lower but instead they have reversed and closed higher, which denotes a change in trend.

When deciding on what type of signal to use as your entry, it is important to keep in mind the type of strategy you are trying to create. There are certain types of entries you don't want to use with set-ups because they have basic flaws that may allow the strategy to miss the big move.

Entry Rule #2 is to make sure that our entry guarantees that we will be in on every move that the strategy was designed to catch. The strength of this guarantee is the criteria by which I judge the viability of all entries. I consider an entry flawed if there is even a slight chance that there could be a big move that the entry would miss. This is a very important strategy development principle that you should think about.

For example, you do not want to use a key reversal signal as the only entry for a trend-following strategy. There is absolutely no assurance that once the trend set-up has occurred that a key reversal will follow. It is possible that after the moving averages have crossed, giving us a buy set-up, the market may very well embark on a long up-trend without as much as once having a key reversal bar. Without the key reversal bar, we would not enter the market even though the trend set-up has given us a signal. Without the key reversal bar, we will miss the big move. And as you now know, missing the big move is the worst outcome for the trend trader.

Another example of a faulty entry is an entry that consists of three consecutive up or down closes. There is no guarantee that given a set-up, this pattern will occur. The market may embark on a long trend without having three consecutive up or down closes in a row. It is possible that a trend-following strategy with this entry could miss the big move, and this possibility is a flaw in the strategy design that should be avoided.

That is not to say however that key reversals or consecutive closes should not be used. You could compensate for their shortcomings as entries by including an additional entry or entries in the strategy that would serve as a backup. The entry or combination of entries must guarantee that the strategy will be in the market should any large trend develop.

TYPES OF ORDERS

The only limit to creating viable entries is your creativity. There are potentially many techniques that make interesting entries. However, entries are also dependent on the type of order used. There are four basic orders that are

commonly used for entries: Market orders, Stop Close Only orders, Stop orders, and Limit orders. Not all of these orders are available on every exchange. You should check the exchange you will be trading on for a list of the available order types.

Market Orders

A market order is used to enter the market without any restrictions on what the price should be. This order is commonly placed on the open of the day (market on open) or close of the day (market on close). However, market orders may also be placed anytime during the day by calling your broker and either buying or selling "at market." Although market orders fulfill the criteria for Entry Rule #2, they are deficient because they violate Entry Rule #1.

It is my view that market orders (market on close, market on open) are not entries at all. They are simply the obvious and easiest way to put on a trade.

Market orders may be turned into viable entries by adding another condition to them that will signal an implied direction. For example, an effective use of a market order would be to "buy tomorrow at market if the open tomorrow is greater than the high of today." This forces the market to indicate a direction, presumably in the direction of the set-up (in this case up) before we enter the market.

A market order may be used to enter the market, but should always be used with at least one more condition in order to fulfill Entry Rule #1.

Stop Close Only Orders

Stop Close Only (SCO) orders are market orders with an important twist. The twist is that to enter long, the market must close above a price that we have pre-selected. For a sell, the market must close below our pre-selected price.

An example is to buy a contract on the close at 856.30 SCO. This means that if the price closes at or above 856.30, the market will fill your order at the market. The idea is that with an SCO order, you have placed an important restriction on the market order, making it a viable entry. This forces the strategy developer to find a price that the market must close above (or below) before the strategy takes a position. By placing this restriction on a market order, we have turned it into a valid type of entry.

Stop Orders

The easiest way to create a valid entry is to use a stop order. By its nature, a stop requires the market to pass through a certain pre-selected price before a contract is bought or sold. Using a non-removable stop order is the best way to create innovative entries and confirm the entry rules.

The reason stop orders are generally superior to SCO orders is that they guarantee that your strategy will enter the market regardless of when during the day the price is hit. You will not have to wait for the close and you may catch a big intra-day move that would be lost if you waited for an SCO.

An example of using a stop order as an entry is the bar breakout entry. If today our set-up turns bearish, we would place a sell order one tick below today's low. Unless prices move below this price, forcing a confirmation of the set-up, the strategy would not take a short position in the market. The same mechanics would hold true for a long signal.

Stop orders that are not removed are also the best guarantee that the strategy will be in for the big move. Placing a permanent sell stop (good until cancelled) below the current price provides the best assurance that you will be in on any move beyond that price. The floor brokers must fill your order as soon as they can once that price is hit. This guarantees you will be in on the move, although there is no guarantee as to the exact price (this difference between the stop and the fill price is slippage, which will be discussed in detail in a later chapter).

Limit Orders

Limit orders are the opposite of stop orders. By their nature, limit orders require prices to be traveling in a direction opposite the set-up.

The primary intent of the limit order is to place a resting buy order somewhere below the present market price. This is an attempt to pick off a lower and better price than where the market is currently. You may also place a resting sell order above the current price to sell at better than current prices. Limit orders are primarily used in support and resistance strategies and are generally not effective.

Assume that the market is now trading at 258.00. The mechanics of a limit order are to place an order to buy a contract or share at 256.50 limit (or better) or sell at 258.50 or better (limit). This means that the floor brokers who are filling your order will only attempt to sell your contract at a price equal to or above 258.50. If the broker cannot sell the contract at or above the price, you will not be in the market. The same strategy is used with the limit buy order.

The limit order does not conform to Entry Rule #1 because it does not force prices to move in the direction of the set-up before entry. There could be a case in which a lower limit price was not reached before the market took off in a big up move.

Even if the market by chance should hit this price, there still is no guarantee that the broker will be able to fill the price. Unlike a stop, which becomes a market order at the prescribed price, a limit order must be filled at or better than the prescribed price. The market may trade at that price for only one or two trades, and then move away quickly. If your broker is not the fastest broker, you may not get filled even though the market traded at your prescribed price.

Limit orders violate both Entry Rule #1 and Entry Rule #2, therefore, I do not recommend them for use as an entry.

Testing the Set-Up

Let's pick a set-up and test it, and then see if we can't improve on it by adding an entry. The simplest set-up I can think of is a simple one-line moving average. Let's make it very simple and buy when the moving average turns up and sell when the moving average turns down.

In TradeStation terms, a moving average has turned up if today's moving average is greater than yesterday's moving average, and the average is giving a sell signal if the current bar's moving average is less than the previous bar's moving average.

Take a look at Chart 1. It is a weekly chart of Coca-Cola (KO) from 1992 to 1996. I've included the 30-period moving average on the chart.

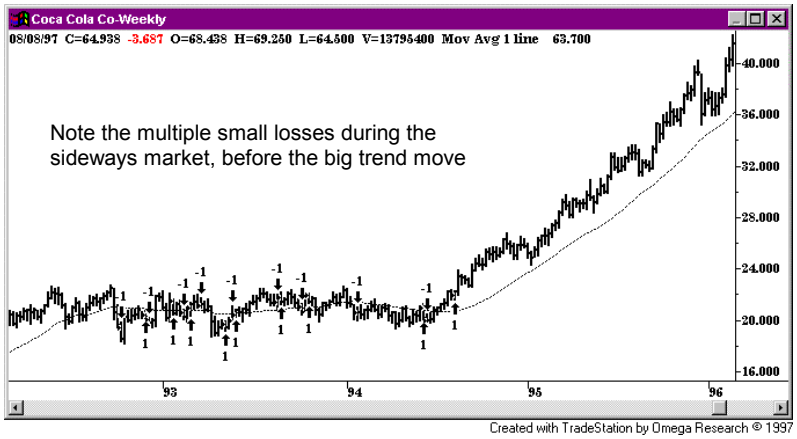


Chart 1

TradeStation EasyLanguage Indicator: Moving Ave Plot

```
Input: Price(Close),Length(30);

Plot1(Average(Price,Length),"SimpAvg");
```

The strategy I've included buys when this moving average turns up and sells when this moving average turns down. Note in Chart 1 that KO went through a directionless period in 1993 to mid-94 and then took off on a trend in mid-1994. This is characteristic of a trend-following strategy, losing money in the choppy period then making it back in the trend.

Strategy Parameter File Moving Average Turns			
Set-Up	30-Period Moving Average Turns		
Entry	None (market order)		
Stops	None	Exits	None
MaxBarsBack	50	Slippage	0
Margin	None Used	Commission	0
Data Source	(KO) Coca Cola Stock – Omega Research		
Data Duration	1/9/70 to 8/8/97		

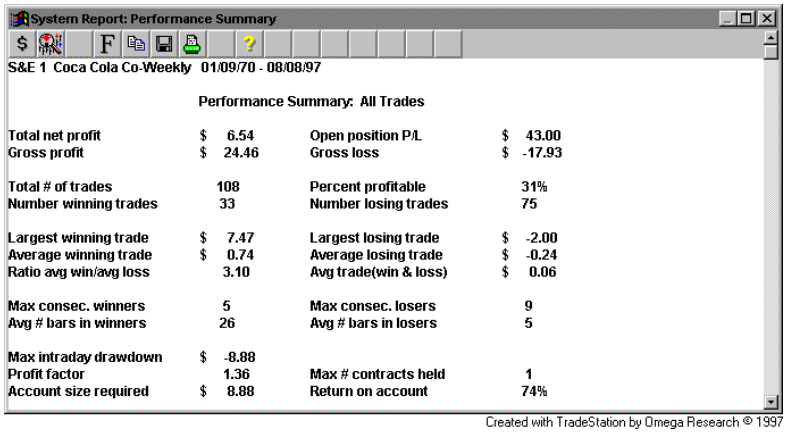
SPF 1

TradeStation EasyLanguage Strategy: S&E 1

```
Input: AvgLen(30);

IncludeStrategy:"Exit on 8/1/97";

IF CurrentBar > 1 and
Average(Close,AvgLen) >
Average(Close,AvgLen)[1]
Then Buy at market;

IF CurrentBar > 1 and
Average(Close,AvgLen) <
Average(Close,AvgLen)[1]
Then Sell at market;
```

There is one important aspect of these tests that you should note. I have included a different line in the strategy, **Include Strategy: "Exit on 8/1/97."** As 8/1/97 is the last data point on my chart, I wanted the strategy to exit on that day. If it doesn't, the strategy results may include a large open position. A large open position on any test makes it very difficult to compare results from different strategies because the open trade equity is not included in the Performance Summary results.

Look at PS 1. It is a Performance Summary of the 30-period moving average strategy, *without* the Include Strategy line.



PS 1

TradeStation EasyLanguage Strategy: S&E 1

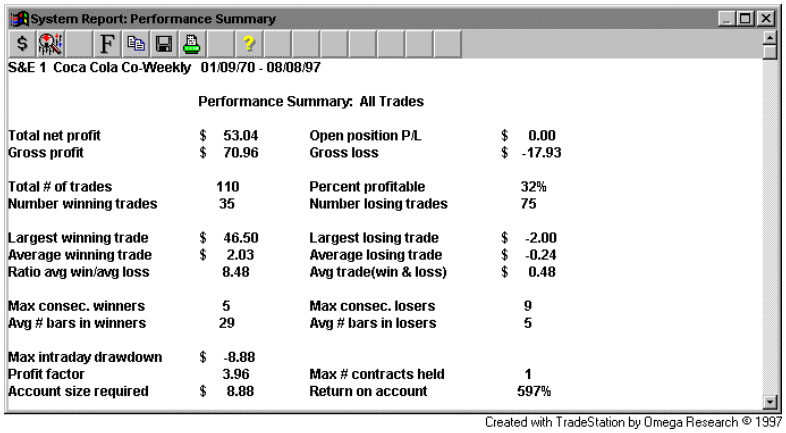
```
Input: AvgLen(30);

IF CurrentBar > 1 and
Average(Close,AvgLen) >
Average(Close,AvgLen)[1]
Then Buy at market;

IF CurrentBar > 1 and
Average(Close,AvgLen) <
Average(Close,AvgLen)[1]
Then Sell at market;
```

You can see that the last trade has a very large profit of $43 per share compared to the results from the last 27 years of $6.54 per share. This was the last long trade from 8/12/94, which you can see in Chart 1.

If we run another test of a strategy that had all trades closed since 8/12/94, it would be hard to compare the two strategies' performance because one would have a large open trade and the other may or may not. The summaries would not be comparing apples to apples.

To remedy the situation, I wrote the small additional strategy that simply exits the market on the last data point (8/1/97). If I include this strategy in all comparable tests, every strategy will be flat on the last date, which ensures that all of the performance data will be comparable.

If you look at PS 1A, which *includes* the strategy, you can see that there is no open position. The Performance Summary is created with the last trade exiting on the last date in the test.



System Report: Performance Summary

S&E 1 Coca Cola Co-Weekly 01/09/70 - 08/08/97

Performance Summary: All Trades

Total net profit	$ 53.04	Open position P/L	$ 0.00
Gross profit	$ 70.96	Gross loss	$ -17.93
Total # of trades	110	Percent profitable	32%
Number winning trades	35	Number losing trades	75
Largest winning trade	$ 46.50	Largest losing trade	$ -2.00
Average winning trade	$ 2.03	Average losing trade	$ -0.24
Ratio avg win/avg loss	8.48	Avg trade(win & loss)	$ 0.48
Max consec. winners	5	Max consec. losers	9
Avg # bars in winners	29	Avg # bars in losers	5
Max intraday drawdown	$ -8.88		
Profit factor	3.96	Max # contracts held	1
Account size required	$ 8.88	Return on account	597%

Created with TradeStation by Omega Research © 1997

PS 1A

TradeStation EasyLanguage Strategy: Exit on 8/1/97

If Date = 970801 then Exitlong at market;
If Date = 970801 then Exitshort at market;

(This strategy is included in the S&E 1 strategy. Notice that there is no open position)

The remainder of the tests in this chapter will include this code so that we can compare all of the strategies as if they had exited on the last day.

How did this strategy do? Well, not so great. As you can see in PS 1A, $.48 a trade is not a great average, especially considering that we did not include our usual slippage and commission of $.50 per share. If we had, the strategy would have lost money. I have previously noted that the last trade was a $43 profit. Without the last trade the strategy would have looked like PS 1. This is even worse. So we should just throw this out and look at something else, right? Wrong!

The problem with this strategy is that it only trades the set-up. There is no entry, or what I would formally call an entry. A market order, for me, is not a valid entry. Unless a market order has any other conditions attached to it, it should not

be used as an entry. The flaw in this strategy is that it does not use a valid entry technique.

If you recall, there are many different ways of creating an entry. The most common is to use some sort of bar breakout technique. I have also mentioned several times that the best way to create a strategy is to use indicators in ways that are unconventional. For me, that means using indicators as entries when they are commonly used as set-ups, or as a set-up when they are commonly used as entries.

In this case, I was looking at an indicator called %R. This is an overbought/oversold indicator that is commonly used as the set-up in support and resistance strategies. Chart 2 shows %R at the bottom of the chart.

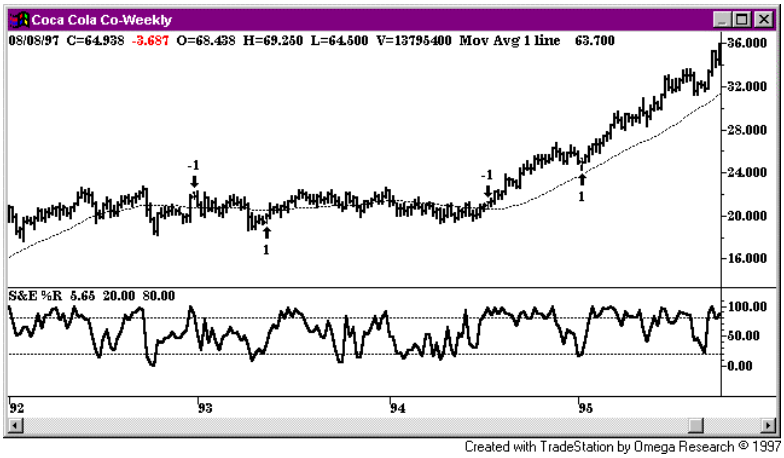


Chart 2

TradeStation EasyLanguage Function : PercentR

```
Input : Length(10);
Value1 = Highest(High,Length)
- Lowest(Low,Length);
If Value1 <> 0 then
PercentR = 100 -
((Highest(High,Length)
- Close) / Value1) * 100 else
PercentR = 0;
```

Indicator: S&E %R Plot

```
Plot1(PercentR(10),"%R");
Plot2(20,"BuyLevel");
Plot3(80,"SellLevel");
```

PercentR tells you where the current price is in relation to the designated range. In this case, we find the highest high of the last 10 bars and the lowest low of the last ten bars. We then calculate the percentage of the current price as compared to the range of the last 10 bars. If the highest high was 20 and the lowest low was 10 and the current price is 16, PercentR would be 60%. If the current price were 14, PercentR would be 40%.

Conventional usage of PercentR would suggest its use as a set-up in support and resistance strategies, similar to how we used the Stochastic Indicator as a set-up in Chapter 3, Markets, Strategies & Time Frames. The buy set-up occurs when %R gets below 20 and the sell set-up occurs when %R is above 80. SPF 2 shows the parameters of this strategy.

Strategy Parameter File Moving Average Direction with %R			
Set-Up	30-Period Moving Average Direction		
Entry	%R below 20% or above 80%, then at market		
Stops	None	Exits	None
MaxBarsBack	50	Slippage	0
Margin	None Used	Commission	0
Data Source	(KO) Coca Cola Stock – Omega Research		
Data Duration	1/9/70 to 8/8/97		

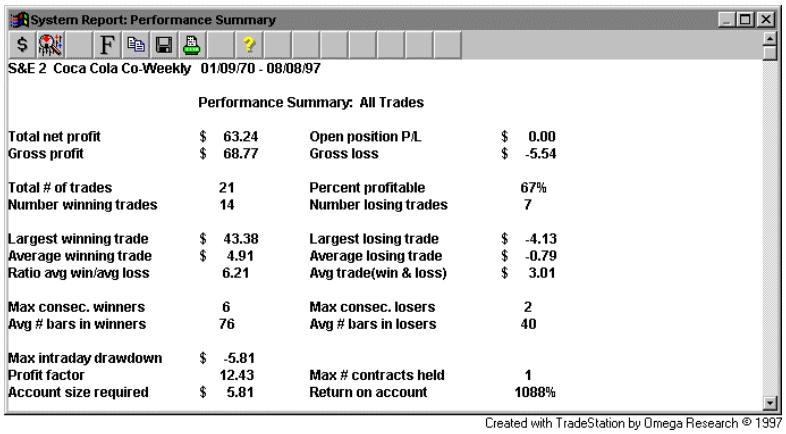
SPF 2

Tradestation EasyLanguage Strategy : S&E 2

```
Input: AvgLen(30),PrctRLen(10),
BuyLvl(20),SellLvl(80);

IncludeStrategy:"Exit on 8/1/97";

IF CurrentBar > 1 and
Average(Close,AvgLen) >
Average(Close,AvgLen)[1] and
PercentR(PrctRLen) < BuyLvl Then
Buy at market;
IF CurrentBar > 1 and
Average(Close,AvgLen) <
Average(Close,AvgLen)[1] and
PercentR(PrctRLen) > SellLvl Then
Sell at market;
```

However, as I was looking at this chart, I thought that instead of using %R as a set-up, I would try to be creative and use it as an entry. Therefore, our long set-up would be the 30-period moving average moving up, and the entry would be %R being below 20%. The short set-up would be the 30-period moving average moving down, with %R being above 80%. Chart 2 has this strategy applied.

If you compare Chart 2 to Chart 1, you can see that the number of trades taken during the sideways market was reduced dramatically by the addition of the entry. This is very positive. The one thing we want to do with trend-following strategies is reduce our cost of trading through the choppy market. The Performance Summary for Chart 2 is shown in PS 2.



PS 2

Note that even though we have no amount for slippage and commision in this strategy, this sytstem would have covered a significant amount.

I use $.50 per share as a ballpark figure for stocks and with an average trade of $3.01 we have a lot of room for S&C. We need to feel comfortable that even if the S&C is greater than $.50 we would be OK.

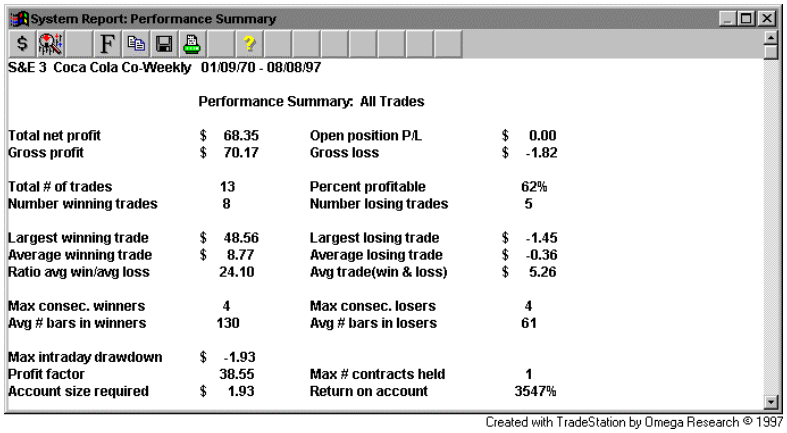
In this case we would be fine.

In addition, as you can see from comparing PS 2 to PS 1A, the results were significantly improved. The profit increased from $53 to $64, percent profitable increased from 32% to 67%, the average profit per trade increased from $.48 to

$3.01, MAXID (maximum intra-day drawdown) down from $8.88 to $5.81 and the ROMID (return on MAXID) went up from 587% to 1088%.

Even though the performance is improved, is this a good entry? Does it confirm the direction of the set-up? No, %R being low goes against the trend, and a market order does not confirm the direction of the set-up. So it violates Entry Rule #1.

Does it guarantee that the strategy will catch every big move? No. It is possible that a big trend move could occur without %R ever getting in the buy or sell range. Thus, it also violates Entry Rule #2. Knowing this, I always check a strategy to see if the bar breakout entry I mentioned earlier, in place of the market order, improves the strategy. I did so here as well. The results can be seen in PS 3.



PS 3

TradeStation EasyLanguage Strategy: S&E 3

```
Input: AvgLen(30),PrctRLen(10),
       BuyLvl(20),SellLvl(80);
IncludeStrategy:"Exit on 8/1/97";
IF CurrentBar > 1 and
Average(Close,AvgLen) >
Average(Close,AvgLen)[1] and
PercentR(PrctRLen) < BuyLvl Then
Buy at high + 1 point stop;
IF CurrentBar > 1 and
Average(Close,AvgLen) <
Average(Close,AvgLen)[1] and
PercentR(PrctRLen) > SellLvl Then
Sell at low - 1 point stop;
```

Compare PS 3 with PS 2. You will notice that the MAXID has all but disappeared. As such, the ROMID has moved up to over 3,500% and we have moved the average trade up to over $5. All this improvement with just changing the entry from a market order to a bar breakout. The SPF is exactly the same as SPF 2 except that we use a bar breakout rather in place of a market order.

Now we have three conditions that must be met in order to get into a long trade. The first is the 30-period moving average being in an up-trend, the second is PercentR is below 20%, and the third is that the price breaks above the high of the previous bar while PercentR is below 20%. Looks great, we're done, and we have a great strategy. Right?

Not quite! As I looked over the TradeStation chart of the entries and exits of the strategy, I noticed something that bothered me about it.

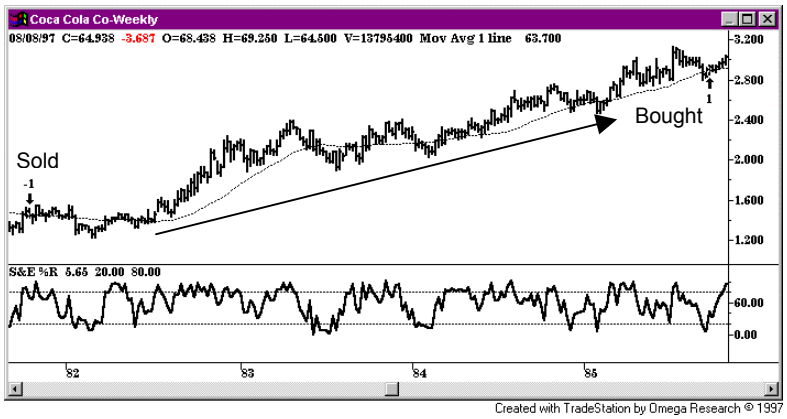


Chart 3

We missed a big move!

As you look at Chart 3, you will see a short trade in late 1981 that loses a significant amount of money as the bull move starts. The strategy sells short at around $1.40 and reverses to long at $2.80. This is a 100% loss! The loss is masked in the Performance Summary by the fact that after adjusting the back data for splits, the stock price was very low so the loss per share looks minor. The key is that while it is minor on a per share basis, it is huge on a percentage basis.

But there is something even more important. We missed the big move! Here is a situation where the price of KO doubled and we were not in. In fact, we not only missed the move, we were on the wrong side of the move, short the whole way up! We must conclude that this entry still violates Entry Rule #2.

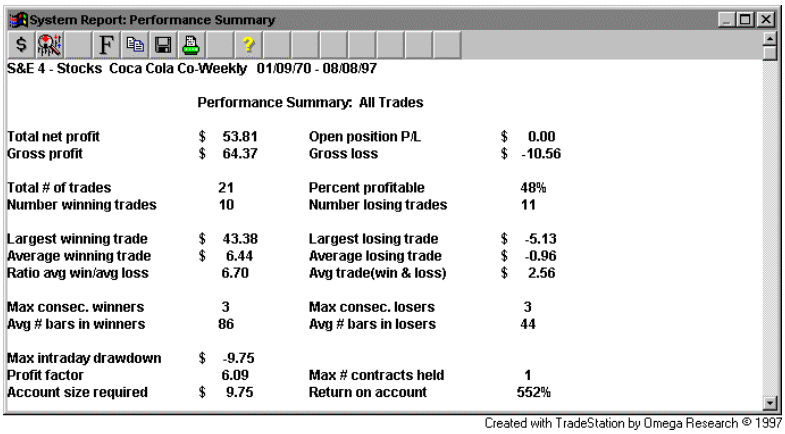
This is a major flaw in a strategy that looks great when you only look at the Performance Summary. Since we missed a big move, and we were creating a trend-following strategy, we know that we are not done. Even though the numbers look great, we have found a major flaw.

I recommend that you use TradeStation to scroll through the chart with the strategy on it, looking at the entries and exits. You will be amazed at what you will find and what you will learn about how indicators, set-ups and entries work and the flaws in your current design.

It is clear from looking at this trade that there is a real possibility that the set-up moving average could be moving up, %R could be below 20%, and we would never get a bar breakout on the upside. Then, when %R moves back above 20%, our orders are cancelled, as the bar breakout would only be in force while %R is below 20%. We need to fix this.

As it currently exists, TradeStation only permits the bar breakout to occur while %R is below 20%. If PercentR moves above 20%, the bar breakout order is

cancelled. This is what causes us to miss this big move. One way to fix this is to direct TradeStation to enter the market if %R moves above 20% once it has been below. This would ensure that every time %R was below 20%, we would enter long when it moves above 20%. The results of this change are shown in PS 4.



PS 4

TradeStation EasyLanguage Strategy: S&E 4

```
Input:AvgLen(30),PrctRLen(10),
      BuyLvl(20),SellLvl(80);
IncludeStrategy:"Exit on 8/1/97";
IF CurrentBar > 1 and
Average(Close,AvgLen) >
Average(Close,AvgLen)[1] and
PercentR(PrctRLen) crosses
above 20 Then Buy at market;
IF CurrentBar > 1 and
Average(Close,AvgLen) <
Average(Close,AvgLen)[1] and
PercentR(PrctRLen) crosses
below 80 Then Sell at market;
```

When we compare PS 4 to PS 3, we find some improvement. Profit is about the same, the percent profitable improves, and the average trade improves. However, the MAXID increases, which makes the ROMID about the same for either strategy. In my view, the performance is about a wash, but the strategy is dramatically improved and my confidence level has gone up. We have corrected a major flaw in the strategy, which caused us to miss a big move.

Look at Chart 4, which represents PS 4. The trend move depicted between the two arrows was so strong that %R never got oversold. If it doesn't get below 20, we will never get long, and as in the above example, would again miss the big move. We need to fix this problem as well.

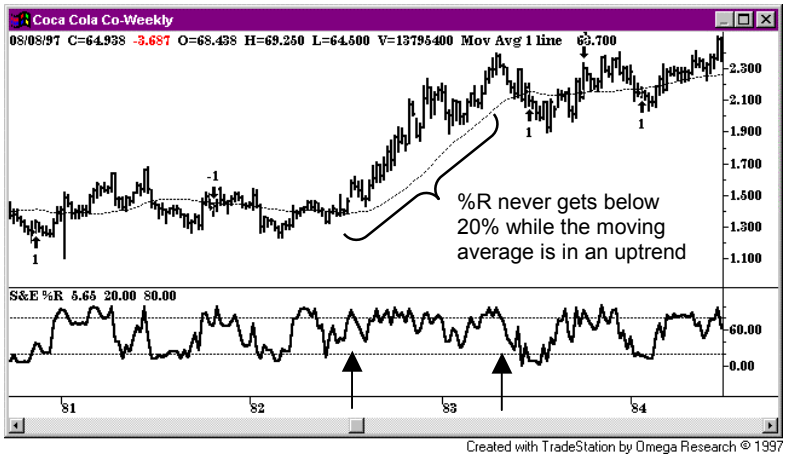


Chart 4

Note that there was a significant amount of time (almost a year) where %R did not get below 20% while the moving average was in an up-trend.

The problem is that when the trend is so strong, %R may never get below 20%, or the reverse could be true, that a downtrend might be so strong that %R never gets above 80%. In either of these scenarios, if we use %R as the entry, we will miss the big move.

The solution is to try to be creative again. But this time instead of fooling around with %R, let's try adding another entry. So, in addition to %R let's put in another entry that will ensure that we will never miss a big move, but will be far enough away that it will not interfere with the %R entries.

When in this situation, the first thing I try is simply inserting a failsafe buy point above the highest high of the last year, and a failsafe sell point below the lowest low of the last year. This would ensure that no mater what happens with the moving average and %R, I will get long if the prices make a new yearly high, or get short if the prices make a new yearly low.

In this case, I chose the last 50 bars, which on a weekly chart is close enough to a year for me. This entry will definitely guarantee that we will not miss the big move, which meets the criteria for Entry Rule #2. The resulting strategy is shown in SPF 3.

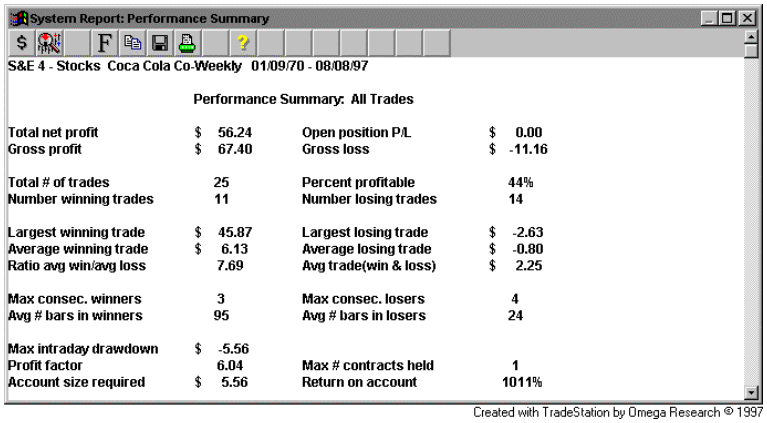
Strategy Parameter File M/A Turns - %R or 50-Wk High or Low			
Set-Up	30 Period Moving Average Direction		
Entry	(1) %R crosses above 20% or below 80% (2) Makes a 50 week new high or low		
Stops	None	Exits	None
MaxBarsBack	50	Slippage	0
Margin	None Used	Commission	0
Data Source	(KO) Coca Cola Stock – Omega Research		
Data Duration	1/9/70 to 8/8/97		

SPF 3

TradeStation EasyLanguage Strategy: S&E 4 modified

```
Input:AvgLen(30),PrctRLen(10),
      BuyLvl(20),SellLvl(80);
IncludeStrategy:"Exit on 8/1/97";
IF CurrentBar > 1 and
Average(Close,AvgLen) >
Average(Close,AvgLen)[1] and
PercentR(PrctRLen) crosses above 20
Then Buy("%R Buy") at market;
IF CurrentBar > 1 and
Average(Close,AvgLen) <
Average(Close,AvgLen)[1] and
PercentR(PrctRLen) crosses below 80
Then Sell("%R Sell") at market;
Sell("LL") at Lowest(low,50)
- 1 point stop;
Buy("HH") at Highest(high,50)
+ 1 point stop;
```

We have come a long way with this strategy, making the entry meet the two entry rules. Let's see the results with the additional entry; they're shown in PS 5.



PS 5
Now that we have added another Entry, compare the results with PS 2 and see if it is an improvement.

The results are much better. We should compare this Performance Summary with PS 2 as all of the interim tests had flaws in them that have been corrected.

The MAXID is reduced, and the ROMID is back over 1000% and close to where we started at 1088%. The largest winning trade is still a majority of the profits, but no worse than the original. The profit factor and average trade are both worse than the original but still respectable. Is this an improvement over PS 2? Yes, all in all this looks like it could be the beginnings of a winning strategy.

But let's look one more time at the chart (Chart 5) to make sure that we fixed the problem that has plagued us, that is, missing the big move. We want to make sure that we have corrected this problem once and for all.

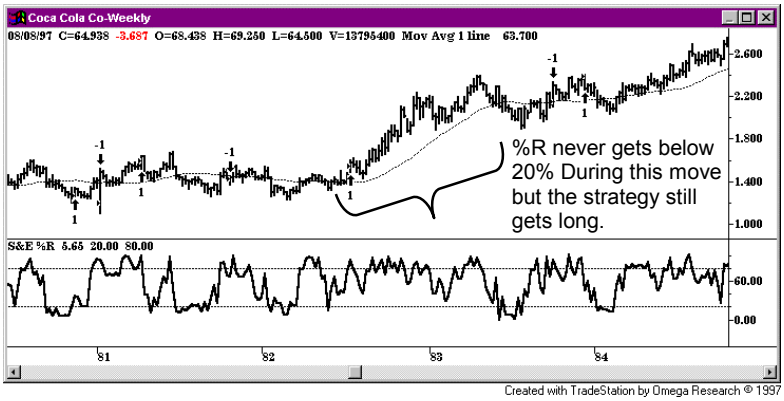


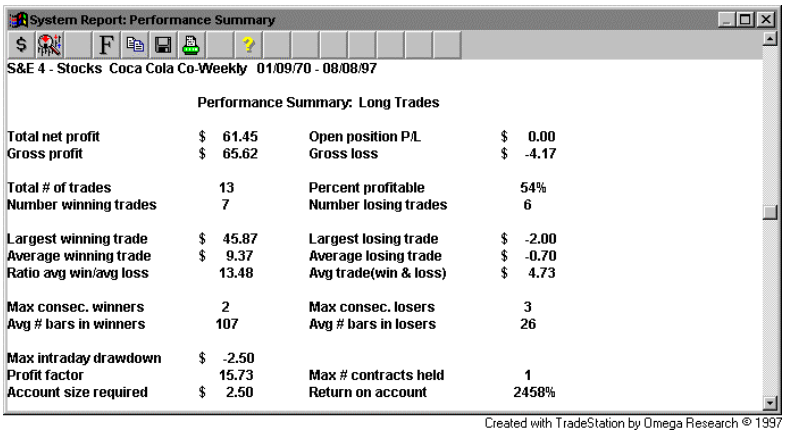
Chart 5

Even though %R never gets below 20 the strategy gets long. It gets long because of the new Entry, the breakout over the 50 week high. Thus we don't miss the big move.

When we scroll through the chart with TradeStation, we see that we didn't miss any of the big moves. The failsafe entry over the 50-week high and below the 50-week low worked.

Is this really a good strategy? Let's leave that for a more detailed discussion in Chapter 8, The Science of Strategy Evaluation. For now let's just look at PS 6,

which is a Performance Summary of the long trades only. How would the strategy look if we take out this trade?



System Report: Performance Summary

S&E 4 - Stocks Coca Cola Co-Weekly 01/09/70 - 08/08/97

Performance Summary: Long Trades

Total net profit	$ 61.45	Open position P/L	$ 0.00
Gross profit	$ 65.62	Gross loss	$ -4.17
Total # of trades	13	Percent profitable	54%
Number winning trades	7	Number losing trades	6
Largest winning trade	$ 45.87	Largest losing trade	$ -2.00
Average winning trade	$ 9.37	Average losing trade	$ -0.70
Ratio avg win/avg loss	13.48	Avg trade(win & loss)	$ 4.73
Max consec. winners	2	Max consec. losers	3
Avg # bars in winners	107	Avg # bars in losers	26
Max intraday drawdown	$ -2.50		
Profit factor	15.73	Max # contracts held	1
Account size required	$ 2.50	Return on account	2458%

Created with TradeStation by Omega Research © 1997

PS 6

The final version of the strategy with all of the flaws removed.

First of all, we notice that most of the losses come from short trades, as does most of the drawdown. This would stand to reason, as the biggest trade is one of the most recent trades, coming from the big bull market of the mid-90s.

One way of testing the robustness of a strategy is to eliminate its biggest winning trade. PS 1 is very close to what this strategy would look like without the largest trade and if you don't include the open trade profit. It doesn't look very good until you realize that the largest trade also occurred during the biggest bull market in history.

Remember that trend traders try to minimize losses in directionless markets until the big bull market comes. If we use this principle to measure the effectiveness of this strategy, it did quite well. The strategy held its own until the big move came, and then it made the big money on the big move. The strategy performed as it was designed. However, we would have needed a lot of patience since it took 20 years for the huge move to come!

Evaluating each Component

In this chapter I introduced the concept of set-up and entry. The basic premise is that most new strategy developers do not organize their strategies in this manner. They use either set-ups or entries, but not both. Using a set-up or entry on its own generally does not work. The power comes when you combine the two. I also introduced two rules for ensuring that entries were effective.

One of the summaries I always like to look at is a short table of each of the components of a strategy and the final strategy itself. I like to look at how the set-up performs on its own, and the profitability of the entry or entries by themselves. Table 1 is that comparison.

The table is a summary of the performance of the different indicators and techniques that I used to construct our strategy for trading Coca-Cola. With this table we are able to gauge what the different characteristics are of each and what they add to the mix. Is the whole greater than the sum of the parts?

Field	Set-Up 30MA	Entry 1 %R	Entry 2 50wk H/L	Combined
Net Profit	53.04	-5.33	63.98	56.24
% Profit Trades	32 %	62 %	45 %	44 %
# Trades	108	87	11	25
Average Trade	$0.48	$-0.06	$5.82	$2.25
Largest Trade	$46.50	$9.94	$62.89	$45.87
MAXID	$-8.88	$-23.13	$-2.17	$-5.56
ROMID	507 %	-23 %	2943 %	1011 %

Table 1

The item that stands out most in Table 1 is the profitability of buying the 50-week highs and lows on their own. What a great return! Unfortunately it all came from the last trade. Without that trade, there would have been almost no profits for twenty years and then one profitable trade. Also, I like to have at least 25 and optimally greater than 30 trades to ensure that the statistics are meaningful. Although our final strategy only has 25, that is within my range of acceptability. It is far better than the 11 from the 50-week breakout entry, which is not acceptable.

When I am working on a strategy and see something that is interesting but doesn't meet my expectations, like this 50-week breakout entry, I make a note to explore it at a later date. I expected that the results of the three strategies would be worse than the combined, and they were. But the results of the 50-week breakouts were

so interesting, even with only 11 trades, that we should pack this technique away for further exploration.

Except for the last trade, the combined set-up and entry strategy is the most reasonable of the four. It has the most reasonable average trade because it is the least dependent on only one trade. The MAXID is also in the acceptable range. The ROMID is in the middle of the range as well, but I don't give ROMID as much weight as the other characteristics because the MAXIDs are so low to begin with.

All in all, for actual trading I would have more confidence in the strategy we developed than the three components. In this case, set-up and entry, and its rules, worked its magic with these indicators and gave us a better strategy than any of the components could deliver. By a better strategy, I mean one that I could trade with confidence.

Ultimately, the question you have to ask yourself is could you trade this strategy? Could you trade and stick with the strategy we have designed? Just because the strategy is profitable and meets our strategy development criteria does not mean it is one we could or would want to trade. Just because it is profitable does not mean that you are emotionally able to trade it. I know so many traders that create or purchase very profitable strategies, but because their personality doesn't match the strategy, they still lose money, all the while lamenting the fact that they can't stick to the strategy.

Summary

Trading the set-up and entry concept and making sure that you follow the rules gives far superior results when compared to trading either set-ups or entries by themselves. Using both a set-up and an entry together enhances the performance and profitability of a strategy. Here's how I like to summarize how you should think about set-ups and entries:

AIM WITH THE SET-UP
PULL THE TRIGGER WITH THE ENTRY

I always use the concept of set-up and entry to develop strategies. There are two distinct parts to strategy writing and keeping these two components in mind will help you to organize your thoughts and design a sound strategy. Above all, this blueprint for strategy development opens up a whole new range of possibilities for us to test.

Chapter 5: The Art of Strategy Design – In Theory

I have refined a standard procedure that I use to work my way through the process of creating a strategy. We will start with the big picture and make increasingly more detailed decisions about the strategy. We will begin with the major assessment of what type market action we want to trade and what kind of trader we want to be. We will end up with making decisions on exits, and how far away to put our money management stops.

Pick the Market Type

Again, the first decision you must face is what type of market action you want to trade. Although on the surface this may look like an easy decision, in fact, it is a difficult judgment. The reason it is difficult is because most new traders only consider one aspect, profits. They simply try to pick the strategy that makes the most money. Unfortunately, focusing on the money will probably lead you to make the wrong decision. It is the psychological aspect of trading each of the market types that is the most important consideration. Keep in mind that it does not make any sense to create a very profitable strategy that you are unable to trade psychologically.

HUMAN NATURE

I always tell traders who are having difficulties that to trade well you have to trade against your human nature. You must buy when everyone is selling and sell when

everyone else is buying. If you think about it, the market is simply the sum total of all actions made by millions of human decisions. These decisions reflect human nature.

Researchers have found that 95% of all traders lose money. If we accept this to be true, then almost all of those millions of decisions will ultimately be wrong. As these decisions move the market, the market reflects human nature, and if 95% of the traders are losing money, it is clear that to make money you cannot trade like everyone else. If everyone else is trading as human nature demands they must, to be successful you have to trade against human nature, your human nature.

The most profitable trades I make usually feel like losers when I put them on. Taking these trades always goes against my human nature. For instance, many years ago I used to day-trade the S&P futures. On one particular day I had suffered a string of six losing trades in a row and had experienced a drawdown in excess of $11,000. This was an extremely difficult day and I was ready to quit when with 45 minutes to go in the day I got another signal. What I really wanted to do was to throw my computer out the window and go home. There was no reason to put on another losing trade. Why throw more money after bad? I was not a masochist! The market was choppy all day and I surely was not going to make any money on another useless trade.

At this point however, I decided that if I did nothing else for the day, at least I would take all of the trades my strategy gave me. If the strategy lost money, then I would have to change the strategy, but I never wanted to say that I did not have enough discipline and stamina to implement the strategy I had developed, even though my instincts told me this next trade would be financially stupid.

So I took the trade, and vowed to take every subsequent trade until the market closed. I was not going to follow my inclination and quit. I would assess the strategy after the markets closed, not during market hours. During market hours, my only job was to implement the trades.

Well, the market exploded into one of those end-of-the-day moves that lasted until the closing bell. Not only did I made back all of the day's losses, I ended up with an $8,000 profit for the day!

Many people were trading the trend this particular day. Trend traders had built up large losses in a very choppy market and most of us simply gave up. Just when we were ready to give up, the market moved. Those who gave up missed the big move. The human thing to do, the financially conservative thing to do was to quit and preserve money for another day. The people that made money traded against

their human nature and stuck it out. It was a very difficult thing to do, but I learned a great lesson on that day.

I learned that to trade the trend effectively you must be able to make the hard trades. The market will push you to your psychological limit before it gives you the profit. It will make sure that all the weak players are gone before it gives those that remain the big move. You need to make sure that you are not one of the weak traders.

The other lesson is, don't try to trade a market type that is impossible for you to implement. If you can't see yourself trading through a situation I just described, or you have been in one or several just like it and had trouble or quit, then trend trading probably is not for you. It is better to recognize early what type of markets you are capable of trading and accept it rather than to lose a lot of money finding out.

THE THREE TYPES

If you recall from Chapter 3, there are three types of market action: trending, directionless and volatile. The first decision you should make is which type of market action you will chose to trade. You might want to review Table 1 in Chapter 3, which sets out the characteristics of each of the three types of strategies.

Whether you are a new trader or an experienced trader, I would suggest either a trend strategy or a volatility strategy. Either you choose a trend strategy, with the knowledge that you are going to have to trade through extended periods of drawdown in the directionless phase, or you choose a volatility strategy that will give you extended periods of doing nothing while you wait for the next trade. Which one is for you?

Choose Your Trading Time Frame

Now that you have made the decision as to what type of market action you will trade, you now face the decision as to what time frame you will trade. This decision is important because the answer has financial implications as well as life-style ramifications.

FULL TIME OR PART TIME

The first decision you need to make is whether you will trade intra-day. For most people this is a decision that means trading full time. It is very difficult to have a day job and trade intra-day. It is not totally impossible, just very difficult. Generally, I would recommend that you not trade intra-day unless you can devote your full attention to the task.

Most people want to trade part time and still hold down a day job. If you want to do this, it is better to trade daily or weekly charts. You will only be able to look at the market after hours, and your strategy design will have to take this into account. The strategy should not require you to check the market during the day.

The financial implications of time frames are harder to get your arms around. I believe that there is only a certain amount of money that you can get from the markets. This money, if you trade correctly, can be understood as profit per bar. That is, there is only so much money to make per bar. Thus, the more bars you can trade, the more money you can potentially make.

Taking this concept one step further, trading intra-day is potentially more profitable as there are more bars condensed into a unit of time. For instance, in a month on the S&P futures, there are 280 30-minute bars, 20 daily bars, and 4 weekly bars. There is potentially more money in the 30-minute charts than the daily charts, and potentially more money in the daily charts than the weekly.

Financially then, to make $10,000, it should take less time on the 30-minute chart (perhaps two weeks), than the daily chart (perhaps one month) than the weekly chart (perhaps 4 months). When trend trading on 30-minute charts, you may trade through 5 or 10 days of directionless market before the relatively big move occurs, on a daily chart, the chop may last six months or longer, and on the weekly charts the sideways market could last for years.

The risk per trade is generally greater with the longer time frames as well. Most entries and exit orders are based on market action. If you are putting an exit order below the low of the previous bar, this could be 50 points on a 30-minute chart, 600 points on a daily chart and 2000 points on a weekly chart. The difference in risk is substantial, but the reward should be proportionally as large.

Time frame choice is a personal decision, and of course there are no right answers. The ultimate decision is personal preference influenced by financial considerations. But make this decision before you start looking for indicators, as the choice of indicators is influenced by the time frame selection.

Design and Chart Your Indicator(s)

WHERE TO GET IDEAS

Where do you get ideas for strategies? There are numerous sources, including seminars, books, newsletters, friends, and strategy purchases. I've found that most good trading ideas are counter-intuitive. The techniques that usually make money seem to go against basic human nature, just like managing a strategy forces you to keep trading against your usual judgement and human nature to be successful. The reason for this is that most people look for ideas that feel good and make sense. If the ideas that made sense and felt good to trade worked, everyone would make money, and we know they don't. It is finding unique ideas and using common techniques in different and creative ways that will make you a successful trader.

BOOKS AND MAGAZINES

Trading books are a good source of ideas. There are always books available that describe a bunch of new or improved indicators and show how to use them. I am always skeptical about the "how to" part of the book, but it is a great place to start. I like to use indicators in my own way, but I usually chart the indicator and test it as the author has suggested. This inevitably gives me a starting point for a whole slew of ideas from which to do my own research.

Magazines are another great place to find ideas. There are several good magazines for commodity traders and some for stock traders.

THE INTERNET

There is a lot of information about trading both stocks and futures on the Internet. If you are not hooked up to the Internet, you should be. If it isn't already, the Internet will soon be the most extensive resource for trading information.

PURCHASE A STRATEGY

Yes, you also can purchase a strategy. They are always available. You can find them in the magazine classifieds, and if you have been trading for any length of time, get pitches for strategies in direct mail. And of course there are the Omega Research Solution Providers, who provide strategies and indicators specifically for TradeStation. So how do we sort through these?

Strategy purchases are a valid way to get ideas, if, and only if, the strategy code itself is disclosed. If the code is not disclosed, you really are at the mercy of the strategy designer.

The important thing to remember about purchasing another person's strategy is that you are also buying all of that person's personal decisions about risk. You are buying a strategy designed to take into account all of another person's psychological quirks and decisions about how trades should be made. They have made decisions as to how many losers in a row are acceptable, how big a drawdown is reasonable, what percentage profitable trades are acceptable to him, not you. You are buying his strategy type and his decisions about what is the best way to trade it.

Unless you are positive that your psychological make-up is very similar to that of the individual who designed the strategy, you are bound to have a problem trading that strategy. I have talked to many traders who have purchased profitable strategies but have been unable to trade them.

I purchase strategies for ideas. If the strategy itself is a black box, that is the strategy and its code is not disclosed, I simply refuse to buy it unless the developer can give me enough information so that I can be sure it meets my criteria. For instance, is it possible that this strategy could miss a big move? I also insist on seeing a historical track record in TradeStation format before I will consider buying a strategy. I want to make sure the Performance Summary reflects something that I will be able to trade. I will not trade anything that I do not completely, totally and thoroughly understand.

SEMINARS

Going to seminars given by individuals or even to the mega-seminars with a whole group of gurus is always fun. One or two good ideas are worth the price of admission. Seminars are also fun because you get to meet other traders and bounce ideas around with them. Many traders I know go to seminars more for the camaraderie and discussions with other traders than for the seminar itself.

One of my favorite places to get ideas is a Larry Williams[4] seminar. They are loaded with TradeStation code and strategy ideas. The idea per dollar ratio is the highest that I have found anywhere.

DESIGN THE INDICATOR

One major source of ideas for your strategy will be indicators. Indicators are the backbone of any strategy. In TradeStation, you will find indicators in the Indicator

Library. Many of the standard industry indicators are found here, and you should plot them on a chart and look for yourself.

What you will find is that, while not all, most indicators are price based. What I mean by price based is that most indicators are calculated by using some number from a price bar: the open, high or low, but most likely the close. If you look at them on the same chart, they look very similar. Take a look at Chart 1.

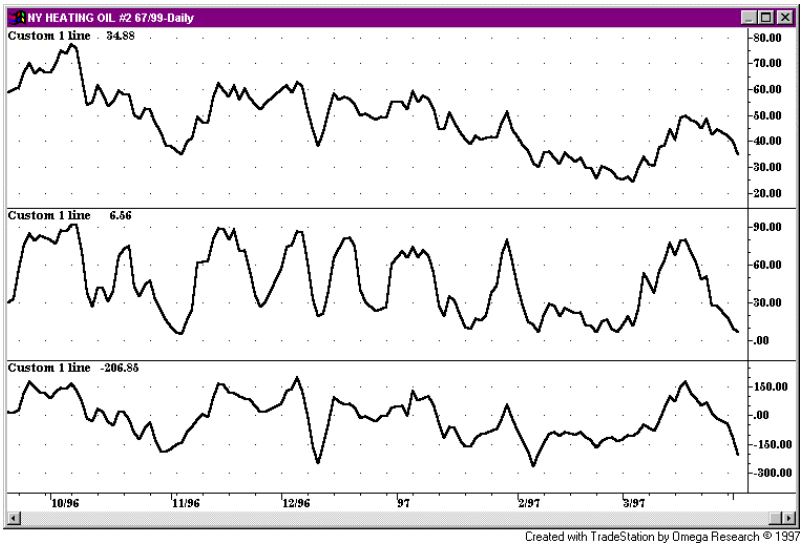


Chart 1

Top:RSI

Middle:Stochastic

Bottom: CCI

Chart 1 shows three indicators that are based on price. There are obvious differences but for the most part they all look about the same, don't they? These indicators are plotted straight from the TradeStation Indicator Library.

What I want you to understand from Chart 1 is that most indicators that are based on the same prices, in this case the close, look about the same. Many new traders try to combine indicators that are based on the same data. This leads to unnecessary redundancy and duplication.

When you consider combining and using multiple indicators in a strategy, try to combine indicators that are based on different prices. For instance, you might combine an indicator based on the close with an indicator based on volume, or with one based on volatility.

Almost any price activity can ultimately be made into an indicator. All you need to do is create a line with quantifiable data and give it a name.

OSCILLATORS

Oscillators are simply the difference between two indicators, most likely different lengths of the same basic indicator. The easiest oscillator to understand is the difference between two moving averages.

The procedure to make two moving averages into an oscillator is to calculate and plot the difference between the two moving averages. The oscillator will "oscillate" over and above the zero line, which represents the price at which the two moving averages are equal.

The top of Chart 2 shows the two moving averages, with the short moving average moving above and below the long. The bottom of Chart 2 shows the same data but as an oscillator rather than the averages.

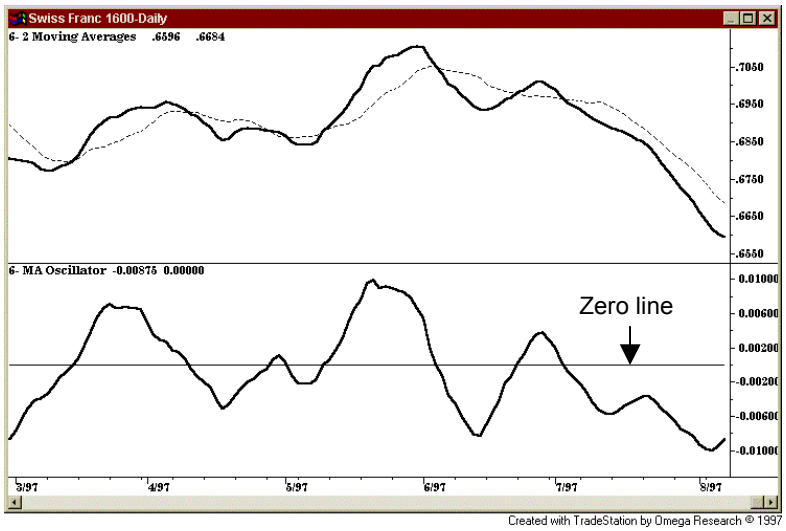


Chart 2

TradeStation EasyLanguage
Indicator: 2 Moving Averages

```
Input: Price(Close),Length1(9),
Length2(18);
Plot1(Average(Price,Length1),
"SimpAvg1");
Plot2(Average(Price,Length2),
"SimpAvg2");
```

Indicator: MA Oscillator

```
Input:Price(Close),Length1(9),
Length2(18);
Value1 = Average(Price,Length1)
- Average(Price,Length2);
Plot1(Value1,"MA Osc");
Plot2(0,"0");
```

If you imagine taking the long moving average and stretching it out so it is straight, and then plotting the short moving average "oscillating" above and below the straight long moving average, you produce the lower chart. In fact the zero line is actually the long moving average.

In Chart 2, if you were to buy the market when the short average crossed the long in the top graph, it would be the same as buying the market when the oscillator crossed above the zero line in the bottom graph.

You can make any indicator into an oscillator by producing a moving average of the indicator and calculating and plotting the difference. For instance, we could make the RSI an oscillator by calculating the RSI and a moving average of the RSI and plotting the difference.

PRICE PATTERNS

In addition to indicators and oscillators, there is a third type of trading idea that is commonly used and that is price patterns. The idea is that you identify specific price patterns and trade them. An easy pattern to understand is consecutive closes. You might want to test buying the market after three consecutive up closes and sell after three consecutive down closes.

This is a simple pattern, but you can make them as complex as your imagination will allow. For instance, we could formulate a buy signal after an up-down-up pattern. That is: today's close > yesterday's close, yesterday's close < the close of the day before, and that close is greater than the previous close.

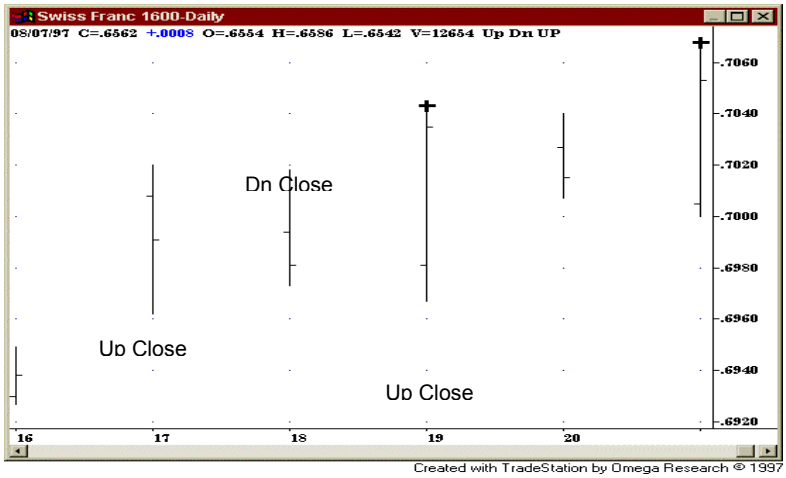


Chart 3

TradeStation EasyLanguage ShowMe: Up Dn Up

```
Condition1 = Close > Close[1];
Condition2 = Close[1] < Close[2];
Condition3 = Close[2] > Close[3];

If Condition1 and Condition2 and
Condition3 then
        Plot1(High,"UDU");
```

I wrote this chart pattern as a TradeStation ShowMe study and applied it to a chart. Chart 3 shows where the ShowMe study has marked two occurrences of this pattern; the marks are the little crosses on the high of the bars. This pattern is a potential set-up. Or, given another set-up, this pattern could be used as an entry.

I have talked to experienced traders who spend a lot of time trying to find profitable patterns (Larry Williams used to teach this in his seminars). They are constantly devising new patterns and testing them in TradeStation. The patterns are generally used as the set-up and they then use either a market order, if the close is in the direction of the trade, or a stop order if it is not. But we know that no matter what we use as an entry, it must meet our two entry rules.

UNCONVENTIONAL THINKING

If I can give you only one piece of advice for using indicators, it would be to use them in unconventional ways. I always try to devise unusual and different ways to use conventional indicators. Remember, if the common indicators made money when used in conventional ways, everyone would be making money. And we know that most people are not making money. Your greatest ally in strategy development will be to devise new and creative ways to use indicators, ways that go against human nature. If you are able to do this, you will have moved a long way towards developing a winning strategy.

Write the Criteria as a ShowMe Study

Once you have found your indicator, oscillator or pattern, the next thing you should do is write it as a ShowMe study in Easy Language and plot it. I do this for several reasons. First, it is much easier to see a situation graphically than it is to simply describe it. Second, we tend to overlook the negative occurrences of a situation and focus only on the positive. Let's talk about each of these.

VISUALIZATION IS THE KEY

When I first started developing strategies, there was nothing like TradeStation available. I had to do it all by hand. I literally would mark ShowMe studies by hand on charts. This was to get a visual look at what I had conceptualized. Many times, just one look would cause me to reject the idea as unworkable. Other times however, the indicator or pattern would look good or would spawn a whole new round of ideas once I saw what my idea actually looked like.

In this case, a picture is really worth a thousand words. There have been countless cases where I have fixed poor strategies with changes that I have found using ShowMe studies. If you look at Chart 3, you can see that it is much easier to visualize the pattern when marked, and assess its strengths and weaknesses then, than it is to write this immediately into a strategy and test it.

THE MIND PLAYS TRICKS

Generally, the way I start with ideas is to look at charts and find examples of what I want to do. Invariably, my mind will pick out all of the situations that work but inevitably it will miss the same exact pattern in situations where the pattern failed. Whether this is wishful thinking or just missing the obvious is irrelevant, and it happens more than I would like to admit.

Producing a ShowMe study is a good means of protection. It saves me from making mistakes, helps me to develop new ideas, and helps me keep my mind from playing tricks on me.

Let's look at an example and you'll see what I mean. In Chapter 4, Profile of a Winning Strategy, I mentioned a chart pattern called a key reversal. If you recall, an up key reversal is a bar in which the low of the current bar is lower than the low of the previous bar, but the close of the current bar is higher than the close of the previous bar. The theory is that this bar indicates an attempt by prices to continue lower but instead they have reversed and closed higher, which denotes a change in trend. If we take a look at some charts, we can see that almost every big bottom occurs on a key reversal. Chart 4 shows an S&P futures chart. I have noted some important up key reversals on this chart.

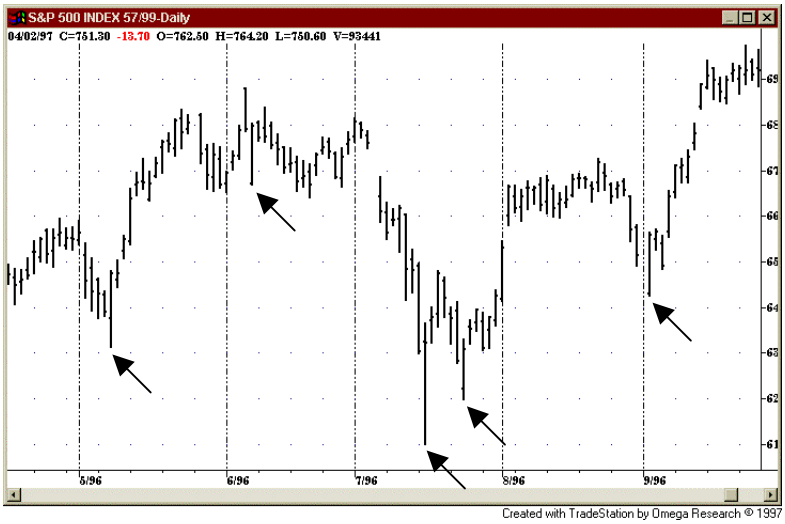
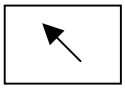


Chart 4

Up Key Reversal ("UKR")



If you look at the marked up key reversals, you will see that they occur at each of the three major bottoms on this chart. It is easy to conclude that we should figure out some way to buy the market at up key reversals. It would get us in at the major bottoms.

To check our market savvy, let's write a ShowMe study marking all of the up key reversals on this chart. Chart 5 shows this ShowMe study applied to a chart.

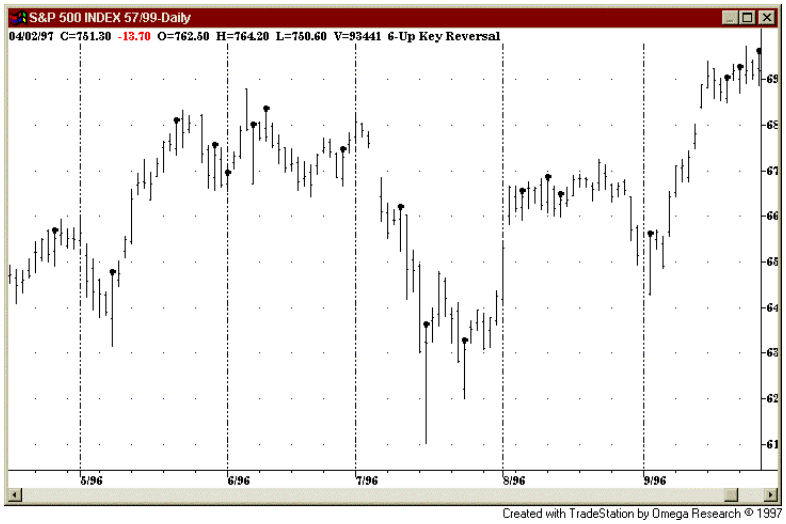


Chart 5

TradeStation EasyLanguage Show-Me: Up Key Reversals

```
If Low < Low[1] and Close > Close[1] then
        Plot1(High,"UKR");
```

In addition to the up key reversals I marked in Chart 4, there are many more that I missed. In fact, some of the ones I missed were potential big losers if you used them for buy signals. I was right about one thing: that up key reversals generally appeared at major bottoms. However, I made another assumption that was wrong. I assumed that the presence of an up key reversal means that a major bottom is occurring. We now know from the ShowMe study that while up key reversals can occur at bottoms, bottoms don't necessarily occur at every up key reversal.

Modify Ideas based on ShowMe Study

Now that we know that ShowMe studies can help us find indicator and strategy idea design flaws, we can refine our idea by modifying the ShowMe study. We can brainstorm for new ideas by changing the ShowMe criteria to better meet our initial idea. You will be able to let your imagination and creativity loose to try all of your ideas. TradeStation will plot your ideas with the objective view of an unbiased observer.

For instance, in the case of the up key reversal, we might want to make sure that the market is in a downtrend or at a bottom area before we consider the up key reversal as a set-up. We might use an indicator such as the RSI or Stochastic to filter out up key reversals that occur in up-trends. Or, we might require the low of the up key reversal bar itself to be lower than the last 6 to 10 bars before we use it. There are so many different ways you can modify this technique that I can't even begin to list them.

The main idea here is to use the ShowMe studies to modify the indicator or pattern, even before you start writing the strategy. We want to make sure that the indicator is producing the signal as we had it in mind and not something else. Many times we will get something else. I would estimate that more than half of the time, the way that I have originally written my idea in EasyLanguage does not produce exactly what I had in mind. It usually takes me several iterations before I get it right. I would rather go through this process with a ShowMe study. Then, when I start writing the strategy, I already have the EasyLanguage instructions for my idea.

Write Alerts to Simulate Trading

The next step, particularly if you are trading intra-day, is to write an alert that has TradeStation tell you when your pattern or indicator has generated a signal. I then monitor this pattern in real time to see if I still think, at the exact moment it occurs, that it is a valid signal. It is one thing to view a signal with the dispassionate eye of historical data and totally another to see it live and try to trade it.

On daily charts, I recommend scrolling through the chart and looking at the signals on the day that they occur and try a little "paper trading." I always find this process fascinating, and if you know yourself well enough to be honest about how you would trade, this can be invaluable. The strategy is to try to get as close to market conditions as possible without actually placing money on the line.

Design the Strategy

Now we have created our indicator or ShowMe study (pattern), have used an alert to see how it works real time, and simulated some market positions to see how we might trade it. It is now time to make this indicator or ShowMe study into a real strategy.

DEFINING YOUR SET-UP AND ENTRY

The first step is to make sure that the indicator or ShowMe study (pattern) and how we use it to enter the market meets all of the criteria of set-up and entry. We know that the set-up should indicate the direction that we want to trade, and should start to define the type of market activity we are trying to trade. Remember that there are different ways to treat set-ups if we are going to trade a trend-following strategy versus a volatility expansion strategy.

Once we have the set-up, we then create the entry using our two entry rules. This is to make sure that the entry confirms the direction of the set-up and also guarantees that we will get in on every move for which the set-up and entry are designed.

USING EXITS

Most trading strategies start with a signal to take a position in the market, both on the long side and the short side. We use set-up and entry to design this signal. A common procedure for trend-following strategies is to test the strategy when it is in the market all the time, reversing with each signal. Then, if you find an indicator or signal that tests well, you can improve on it by using various exit strategies.

There are various reasons to use an exit rather than just reverse a position. The most common is to simply take a profit at a predetermined price level or indicator level. This would be a profit objective and is commonly called scalping the market with a price target.

A second reason would be if you determined that there are certain conditions under which you want the strategy to be flat, rather than short or long. For instance, if the price closes below a short moving average, but is still above the long moving average, you may not want the strategy to go short, but you may not want it to go long either. So you would design the strategy to be out, neither long nor short, waiting for the next signal.

The third reason to use exits is when you are writing a strategy that is based on several indicators (perhaps two set-ups and an entry) that must be in agreement before a position is taken. When one or two of the indicators turns against the position, the strategy exits the market, waiting for the three indicators to agree again.

One of the most common errors in strategy design occurs when the individual uses either the set-up or the entry as an exit. As I have shown you in Chapter 4, Profile of a Winning Strategy, trading just set-ups or just entries is not effective. The use of an exit is less important if you focus on the concept of set-up and entry because the set-up and entry technique is very effective by itself. In some instances, it is very important to know what not to do rather than what to do. In this case, it is much more instructive to know that using either set-ups or entries as exits is not the recommended way to go.

Exits must be based on market activity, and should be used only if there are specific logical market reasons for you to be out of the market. Exits should not be designed to save you money or protect your capital. They should be used to increase your profits. And although this may sound like double talk, it isn't. Protecting your capital is the role of money management stops.

Exits are more appropriate for volatility expansion strategies and support and resistance strategies than for trend-following strategies. By their nature, both of these strategy types have short-term trades that take advantage of short-term market conditions. For instance, in a volatility expansion strategy, we wait for the next increase in volatility and then enter the market. We would then devise an exit that would get us out of the market when the volatility increase had run its course. Or, when we had achieved our profit objective.

With trend-following strategies, we must be sure that if the exit rule gets us out of the market, the entry makes sure that we are back in for the big move for which the strategy is designed. Sometimes using an exit signal prevents a timely entry back into the market, and the strategy misses the next move. This can be checked in the way I described earlier, by using ShowMe studies and scrolling through the chart.

USING A STOP LOSS

Stops are used for one purpose only, and that is to protect your capital. They are placed either to limit losses or to protect profits. Stops are usually based on some dollar figure rather than a market indicator or price pattern.

Stops share one characteristic with exits in that they are an interim step between entries. They force the strategy out of the market, which then requires a re-entry. You should give this re-entry the same thought and attention that you would give a re-entry for exits.

The first stop you should consider is a **money management stop**. This is simply the maximum amount of money that you are willing to risk on any one trade. It is placed after the initial entry and is usually not moved. The decision to place this stop is dependent on the strategy. If your set-up and entry techniques are sound, the strategy may not need a money management stop. The next entry would reverse positions before any money management stop would be hit.

The only rule for money management stops is that they must not interfere with market action. If the money management stop is hit before the exit or the reversal, then it is too close to the entry price and is interfering with the strategy's ability to interact with market action. As a general rule, I recommend that money management stops not be hit more than 10% of the time. If you scroll through the trade by trade record of your strategy and notice that the money management stop is being hit regularly, you should consider changing the stop.

Another thing to remember is that the volatility of markets changes over time, and what has been a good money management stop for the last few years may not be appropriate now. For instance, the stock market has risen substantially in the 1980s and 1990s. If you designed a strategy in 1988 for the S&P, when it was trading about 300, the money management stop is probably too small for the market that is trading at 800. So keep in mind that if you use money management stops, you should keep testing for the appropriate level. You will know that your stop is not appropriate when you get stopped out of a move too early because your stop interferes with market action.

Another stop you should consider is the **profit protection stop**. This strategy consists of what is called a trailing stop, which protects profits once the trade has moved into profitable territory. A trailing stop keeps moving with the profits. For example, in a long trade, you might decide that you only want to risk $1,000. Each night, after noting the close, if the price has moved up in your direction, you would also move the stop up so that it would be $1,000 away from the close. This type of stop may also be redundant if you have developed a viable set-up and entry.

Money management and trailing stops can also be combined to limit the total risk of any one trade. For instance, the initial money management stop might be $2,000 away from the entry price. This limits your total exposure in the worst case scenario to $2,000. Once the strategy moves into profitability, a trailing stop is placed $2,000 away from each day's closing price. When the profit reaches $2,000, your trailing stop ($2,000 below the close) would be at breakeven. If the price continues up, each successive new high would result in the trailing stop being moved up to protect even more profit.

Stops can take many forms, and in the final analysis, which to use is an individual's prerogative. The use of a stop depends on your trading style and risk aversion. As with exits, stops are less important if you have spent the time and energy to develop a sound set-up and entry strategy. The use of stops will not make a poor set-up and entry strategy sound, but a viable set-up and entry may make conservative stops unnecessary. Remember the following statements.

STOPS ARE USED TO PROTECT YOUR CAPITAL

EXITS ARE USED TO RESPOND TO SPECIFIC MARKET CONDITIONS

Test and Optimize the Strategy

Once you have conceptualized and written all of the components of the strategy, you will then want to test it. I always recommend that you test each part as you add it to the strategy, to see if there is improvement and, if so, how much.

I would first test the set-up and see how profitable it is on its own. Then add the entry and see what the improvement is. This is the backbone of the strategy. For trend-following strategies, I require that the set-up and entry be profitable on its own without adding any exits or stops. For volatility expansion strategies, I don't require initial profitability, but I am more comfortable if it is profitable right away. I have always thought that if a set-up and entry for a volatility expansion strategy also makes money as a trend entry, it is more robust and I would have more confidence in it.

When you have proven to yourself that you have a viable set-up and entry, you can then move on to test exits, and then money management stops. If your strategy isn't profitable at this point, you have either picked the wrong indicators or still have some design flaws that need to be fixed.

Many new traders think that they can fix a strategy through optimization. They rationalize that even if a strategy has a solid set-up and entry, good exits and stops, but loses money, they can fix it by optimizing the lengths of the indicators. I will talk about optimization at length in Chapter 7, Optimization, The Double-Edged Sword, but suffice it to say that optimization should never be used to make an unprofitable strategy viable.

The major point that you should understand for optimization is that optimization should make a profitable strategy more profitable. It is only a method for tweaking the profits. Optimization should never be used to make a bad strategy good.

Optimization is used appropriately if it makes a viable and profitable strategy more robust.

Implement and Trade the Strategy

At this point, we have created a viable strategy and improved it through optimization. We are now ready to trade it. TradeStation is ready to give you your orders automatically.

I heartily recommend that you use this aspect of TradeStation. It is the ultimate aid to self-discipline. There are many possible distractions during the trading day, phone calls, unusual market action, and important breaking news, just to name a few. We know that to reproduce the strategy in real time we have to trade it exactly as it has been written and tested in the past. The distractions during the day may make it difficult to implement the strategy exactly as it was designed.

One of the major traps is to try and second-guess the strategy; to personally filter the trades based on your own ideas. I call it playing "beat the strategy." I really don't recommend playing beat the strategy.

If we are truly going to run our trading like a business, we have to implement the strategy as designed. If the strategy doesn't make money, we need to change the strategy. To corrupt the strategy through filtering trades with personal bias is a major problem that new traders face.

Using TradeStation to put on the trades for you is the best tool for discipline that I can recommend, short of having someone else do it for you. If you take every trade as the Strategy Tracking Control Center (STCC) dictates, you will be well on your way to successful trading.

The STCC does two things for you. First, it is unbiased and won't misinterpret signals that could lead to mistakes. Before TradeStation, on occasion, I would be distracted and put in an order that I shouldn't have or put it in wrong. It is human nature not to pay attention all the time.

The second benefit of the STCC is that you can use it to force you to take all of the trades when they should be taken. If you commit to putting in every order the STCC gives you, your trading discipline will be sound. I can't tell you how many traders have trouble implementing trades, even with the STCC. With TradeStation actually beeping at them, providing the correct orders, they are still unable to implement the strategy. I believe that the reason this occurs is because the strategy has not truly been designed to the personality of the trader.

If you have trouble putting on your trades, even while using TradeStation's STCC, you should make sure that the characteristics of the strategy fit your own trading style, that you can accept the risk and drawdown and comfortably take all of the losing trades. If you can't take the losses and drawdown, you must either fix the strategy or find a new one that is more in harmony with your personality.

Modify the Strategy based on Trading Experience

It is not reasonable to expect that you could have thought of everything about the strategy before it is actually traded. I usually end up tweaking a strategy once I start to trade it. There is nothing like actually putting on the trades to give you that direct insight into the viability of a strategy. The point here is to realize that the chances are good that you will want to change the strategy once you gain some experience trading it.

The only caveat I will give you is not to modify the strategy during trading hours. This is best left to the calm peaceful moments when the markets are closed. As you are trading, write down your potential modifications, note any peculiarities of the strategy, and notice the personal difficulties you are having actually implementing the trades. Then, after market hours, you can take a detached view as to how the strategy traded and how you would have liked it to trade.

Understand that there is no Holy Grail

There is no Holy Grail in trading. There is no single indicator that will produce 100% profitable trades. There is no technique that will make trading a breeze and making money an easy task. This is reality.

Choosing an indicator, therefore, becomes a decision of personal choice, rather than right or wrong, or of good or bad. I have always believed that you could give a successful trader a poor indicator and that they will soon figure out how to trade it profitably even with the odds stacked against them. But give a good indicator to an inexperienced trader and he or she will most likely lose money, even with the odds in their favor.

So how do you go about choosing your indicator? How do you sort through all of the books, strategies for sale, seminars, and the Internet? How do you know when a trading guru promises you instant wealth whether his or her trading material is sound? The answer is not as hard to find as it may seem.

There are literally thousands of indicators to choose from. Just look at those available in the TradeStation Indicator Library and you'll be overwhelmed with the choices. When you couple all of the standard indicators with the ability of using TradeStation to make your own, you are literally approaching infinity.

The place to begin to filter through all of these choices is to first make a decision as to the type of strategy that you are going to trade. Once you make this decision, it will probably eliminate half of the alternatives. The indicator you choose should be designed for the type of strategy you are going to trade. This decision will also force you to decide what type of trader you will be. Remember it is very important that you make some decisions on the big picture, the overall strategy, before you get to the details.

The indicator should not be totally derived from price. Traders, particularly novice traders, that lose money consistently are inevitably using price-derived indicators. The more removed you can be from direct price correlation, the more reliable and profitable your indicator is going to be. While I have not seen any studies proving this hypothesis, it has been a rule that I have lived by for many years.

I try to use or design indicators that are either not directly related to price, or are several derivatives away from price. If you can use volume, range, advances and declines, new highs or new lows or open interest to modify the price-based indicator, it should become more effective.

Another way to deal with this issue is to combine non-price indicators with those that are price derived. This way you can start to filter your price-derived indicators with other types of data.

If you decide to use a standard indicator, its performance will improve if you use it in a different manner than it was originally intended. For instance, one of my favorite techniques is to use a support and resistance indicator for trend trading. Remember that if 95% of all traders lose money, chances are they are also using standard indicators in conventional ways. If you want to trade profitably, you must trade differently than the other 95%. That means using standard indicators in unique ways.

The indicator and the way it is calculated should make sense. While this may sound obvious, it always amazes me that so many people trade indicators that they don't understand.

First you should know how it is calculated. Study the formula and see if it is logical. Try to understand why this indicator is supposed to work and what market action it is supposed to represent.

The logical part is the most important. If the theory and computations do not make sense to you, chances are it doesn't make sense at all. There are a lot of trading methods and indicators floating around that don't make a lot of sense, and they probably won't make money either. The indicator should be simple. As a general rule I believe that the complexity of the indicator is inversely proportional to its usefulness and profitability.

The indicator you choose should be profitable or close to breakeven in its pure state, that is without optimization or money management improvements. Starting with an indicator that loses money and trying to fix it is a much more difficult task than starting with a poor but profitable indicator. If you start with a profitable base indicator, the chances of developing something that you would actually want to trade are greatly increased.

Become an expert on one indicator. Most people make random attempts at finding an indicator and a market to trade it. When the most recent choice begins to fail, they start another random walk down the indicator/market road. You should avoid this trap. Pick your indicator because you understand what type of market action it is trying to capture, and you believe that you can trade this type of market action. Become an expert on this indicator. Learn its personality and its little quirks. And again, use set-up and entry. This is the basic format for all of our strategy development.

Summary

The Art of Strategy Design consists of 10 steps. If you follow these steps, your chances if developing a sound strategy will increase dramatically.

The 10 Steps of Strategy Design	
1.	Pick the Market Type (trending, directionless, volatile)
2.	Choose your Trading Time Frame
3.	Design and Chart your Indicator(s)
4.	Write the Criteria as a ShowMe Study
5.	Modify Ideas with ShowMe Study
6.	Write Alerts to Simulate Trading
7.	Design the Strategy
8.	Test and Optimize the Strategy
9.	Implement the and Trade the Strategy
10.	Modify based on Trading Experience

Now let's go on and actually create a strategy using these steps.

Chapter 6: The Art of Strategy Design – In Practice

Let's walk through the process of creating a strategy discussing the steps along the way. I think we should be able to develop a strategy using the up key reversals (UKR) that I pointed out in the last chapter. If you recall, we had looked at a full chart of UKRs and realized that there was more substance there than we had originally thought. UKRs were not only at bottoms but occurred all over the chart. I have reproduced the chart as Chart 1 below.

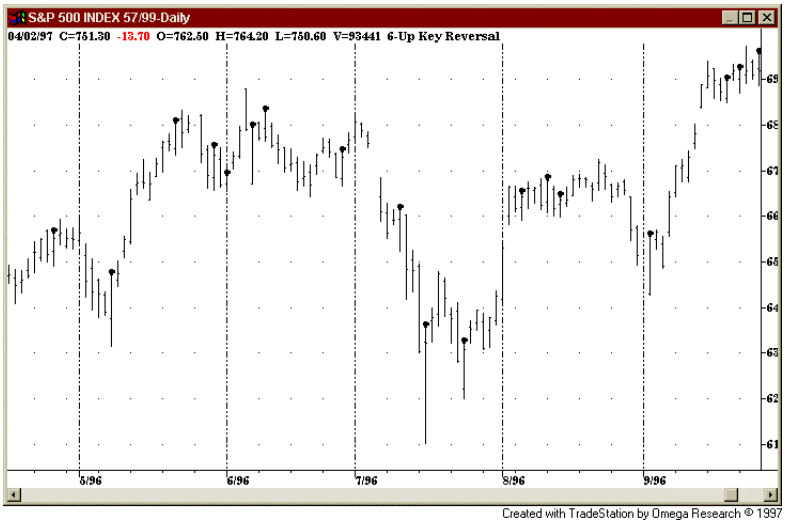


Chart 1

This is the same as Chart 5 in Chapter 5. It includes a ShowMe Study marking every up key reversal ("UKR").

The first question we will ask ourselves is what type of strategy are we trying to create? Will it be a trend-following, support and resistance, or volatility expansion strategy? In this case, I will choose to create a volatility expansion strategy, making

the assumption that with a UKR will come an increase in volatility that will last for a few days. We could also try to create a trend-following strategy based on the UKR as the long entry and a down key reversal as the short entry, but you can try that on your own. For this example, we will stick to a volatility expansion strategy based only on the up key reversal.

So at this point we have chosen the market type: volatile. For our time frame we'll choose daily charts. We have designed and charted the indicator (UKR) and written the criteria as a ShowMe study (Chart 1) and have started to modify our thinking based on what we saw in the ShowMe study.

Now let's test the UKRs knowing that there might be some problems we will find along the way. Our set-up will be the UKR itself. The current bar's low lower than the previous bar, and the close higher than the close of the previous bar.

For the entry, we want to start with something that meets our two entry rules. First, our entry must force prices to move in the direction of the set-up (in this case up). Second, our entry must guarantee that we get in the market after a UKR (we won't miss a move after an UKR). We could justify a market on close order because the close is in the direction of the set-up, but I always try to use a breakout entry with a stop order. So I chose to force prices to get us long with a buy stop one tick above the high of the UKR.

I write this signal so that the breakout must occur on the day following the UKR, reasoning that if it did not, the volatility has diminished and that I didn't want to be in the trade. The result is that if we are not filled on the following day, we will have to cancel the order, and wait for the next signal.

We also need an exit for this strategy. A volatility expansion strategy is not in the market all the time, and it is not a reversal strategy, so an exit is necessary. As I view Chart 1, it looks as if we might make a profit by exiting the market on the entry day at the close. A significant number of these trades look as if they will make money. SPF 1 outlines the parameters of this strategy.

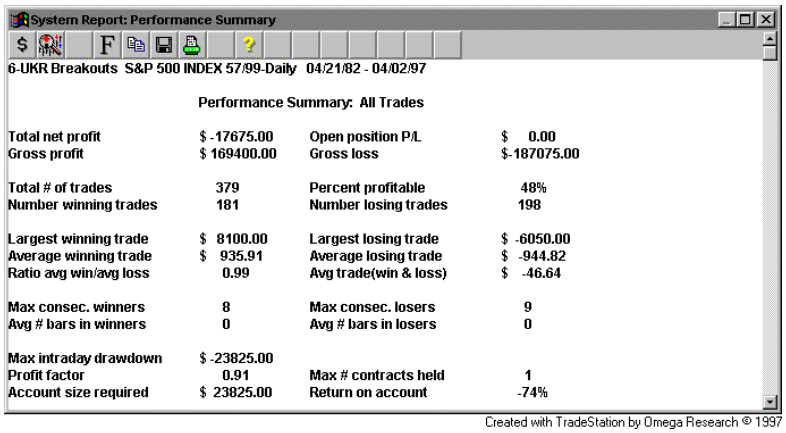
Strategy Parameter File Up Key Reversal Breakout			
Set-Up	Up Key Reversal ("UKR")		
Entry	Breakout over High of UKR		
Stops	None	Exits	Entry day on Close
MaxBarsBack	50	Slippage	0
Margin	None Used	Commission	0
Data Source	S&P Futures – Omega Research CD		
Data Duration	4/21/82 to 4/2/97		

SPF 1

TradeStation EasyLanguage Strategy: Up Key Reversal

```
Condition1 = Low < Low[1];
Condition2 = Close > Close[1];

If Currentbar > 1 and Condition1
and Condition2 then Buy at High
+ 1 point stop;
```

At this point, we will test this on the S&P futures. I have not used any slippage and commission, although please note that I always recommend at least $100 for this cost. I keep an eye on this cost by watching the profit per trade results on the Performance Summary, and I always put it in the last test of the strategy. PS 1 shows the results of this strategy.



System Report: Performance Summary

6-UKR Breakouts S&P 500 INDEX 57/99-Daily 04/21/82 - 04/02/97

Performance Summary: All Trades

Total net profit	$ -17675.00	Open position P/L	$ 0.00
Gross profit	$ 169400.00	Gross loss	$-187075.00
Total # of trades	379	Percent profitable	48%
Number winning trades	181	Number losing trades	198
Largest winning trade	$ 8100.00	Largest losing trade	$ -6050.00
Average winning trade	$ 935.91	Average losing trade	$ -944.82
Ratio avg win/avg loss	0.99	Avg trade(win & loss)	$ -46.64
Max consec. winners	8	Max consec. losers	9
Avg # bars in winners	0	Avg # bars in losers	0
Max intraday drawdown	$ -23825.00		
Profit factor	0.91	Max # contracts held	1
Account size required	$ 23825.00	Return on account	-74%

Created with TradeStation by Omega Research © 1997

PS 1

Note that 48% of the trades were profitable.

The important statistic here is that the average losing trade was greater than the average winning trade.

This obviously was unsuccessful. The only way we are going to find out what went wrong is to look at the chart. We need to scroll through the trades and look at the execution to see what is going on.

Out of the ten trades shown on Chart 2, I count four winners, with only one being very profitable (mid-February). In several cases, had we held on for a few more days, we would have made more money. It looks like the exit may be the problem. Also, remember from our previous discussion that we were concerned about taking all of the trades, that we wanted some sort of filter to ensure that the market was in a downtrend before we used the UKR.

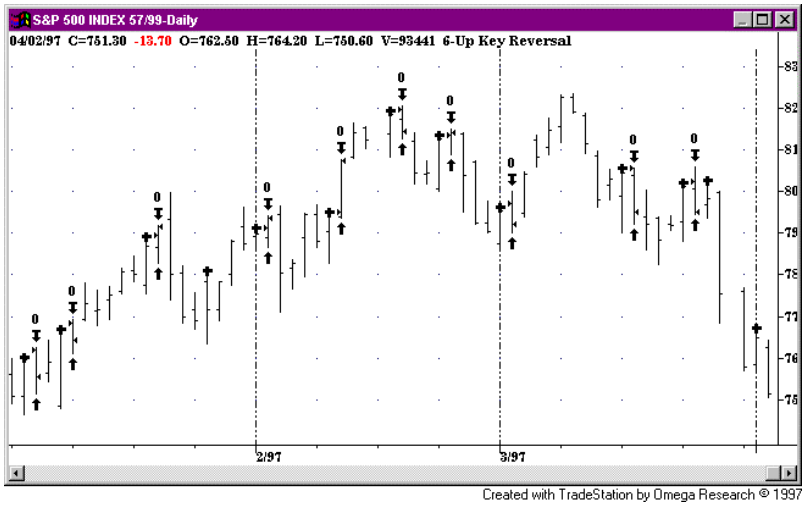


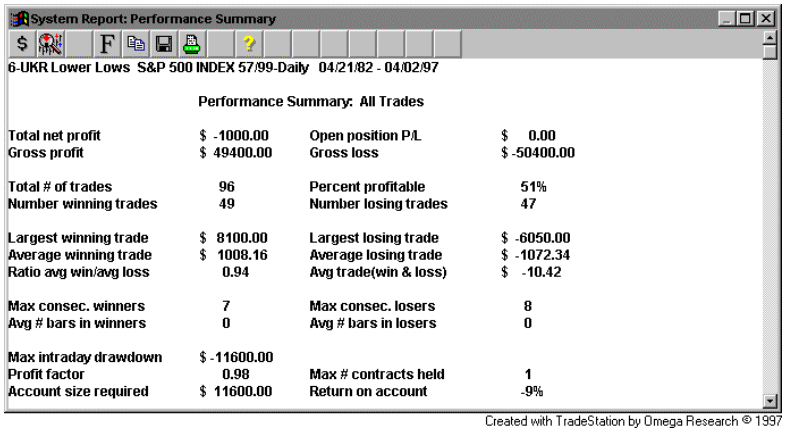
Chart 2

The key reversals are still marked with the cross on the high.

The entries and exits from the strategy test are marked as well.

So we now have two things to try as we attempt to improve the strategy. The first is varying the length of the holding period, and the second is filtering the signals themselves so that the market is in more of a downtrend before we use a UKR.

First, let's look at making sure that the market is in a downtrend before we take a UKR. To do this we require that instead of the low being lower than the previous low, we will require that the low be lower than the last 10 lows. Using a two-week low rather than only the previous day's low should make sure that the market is in a downtrend.



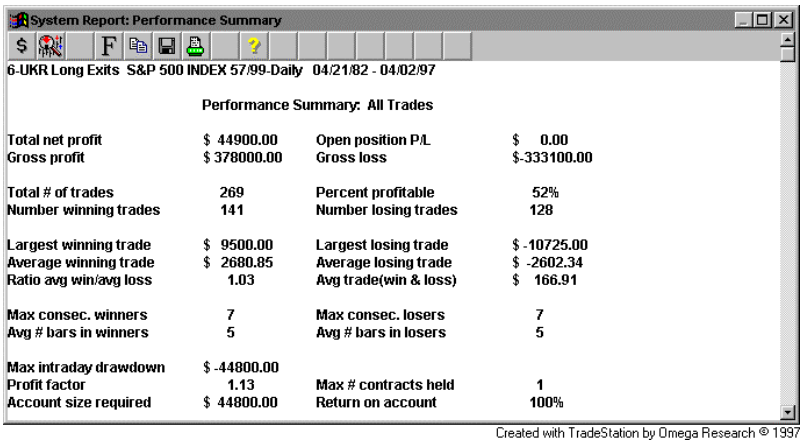
PS 2
TradeStation EasyLanguage Strategy:UKR Ten Lows

```
Condition1 = Low < Lowest(Low,10)[1];
Condition2 = Close > Close[1];

If Currentbar > 1 and Condition1 and
Condition2 then
        Buy at High + 1 point stop;
```

As PS 2 shows, this change resulted in substantial improvement even though overall it was still a loss. We will keep in mind that there probably is an optimal number of lows before entry, but remember, we want the strategy to be profitable without optimization.

Since this was a major improvement, let's move on to testing the holding period. We'll change the low back to the low of the previous day so that we are only testing one change at a time.

From looking at the Chart 1, I think holding for 5 days instead of exiting on the day of entry should be interesting. PS 3 shows the results, a major improvement over PS 1. In fact, we actually moved into profitability. The average winning trade has finally become greater than the average losing trade, and this, coupled with the 52% profitable trades, has put us into the black.



PS 3

TradeStation EasyLanguage Strategy: UKR Long Exits

Condition1 = Low < Low[1];
Condition2 = Close > Close[1];

If Currentbar > 1 and Condition1 and Condition2 then Buy at High + 1 point stop;

IF BarsSinceEntry(0) = 5 then Exitlong on Close;

At least now we know that we have something to work with and we don't have to throw out the whole concept. If this had not worked, I probably would have started over with a new idea.

Now its time to add the two improvements at the same time and run a test. We will call this test UKR Breakouts 2. The Strategy Parameter File is shown in SPF 2.

Strategy Parameter File Up Key Reversal Breakout			
Set-Up	UKR – 10 day low		
Entry	Breakout over High of UKR		
Stops	None	Exits	5 day Close
MaxBarsBack	50	Slippage	0
Margin	None Used	Commission	0
Data Source	S&P Futures – Omega Research CD		

SPF 2

TradeStation EasyLanguage Strategy: UKR Breakouts 2

Inputs:BSI(5),LL(10);

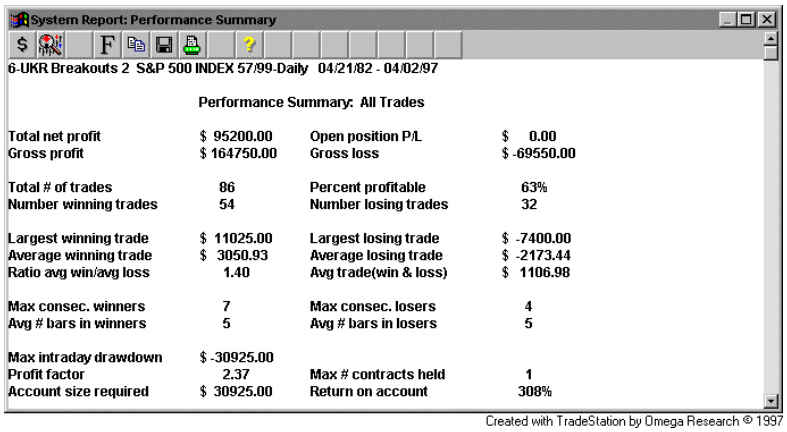
Condition1 = Low < Lowest(Low,LL)[1];
Condition2 = Close > Close[1];

If Currentbar > 1 and Condition1 and Condition2 then Buy at High + 1 point stop;

IF BarsSinceEntry(0) = BSI then Exitlong on Close;

Data Duration	4/21/82 to 4/2/97

The results of this test combining the two were surprising, as you can see in PS 4. I did not expect the improvement to be so good.


System Report: Performance Summary

6-UKR Breakouts 2 S&P 500 INDEX 57/99-Daily 04/21/82 - 04/02/97

Performance Summary: All Trades

Total net profit	$ 95200.00	Open position P/L	$ 0.00
Gross profit	$ 164750.00	Gross loss	$ -69550.00
Total # of trades	86	Percent profitable	63%
Number winning trades	54	Number losing trades	32
Largest winning trade	$ 11025.00	Largest losing trade	$ -7400.00
Average winning trade	$ 3050.93	Average losing trade	$ -2173.44
Ratio avg win/avg loss	1.40	Avg trade(win & loss)	$ 1106.98
Max consec. winners	7	Max consec. losers	4
Avg # bars in winners	5	Avg # bars in losers	5
Max intraday drawdown	$ -30925.00		
Profit factor	2.37	Max # contracts held	1
Account size required	$ 30925.00	Return on account	308%

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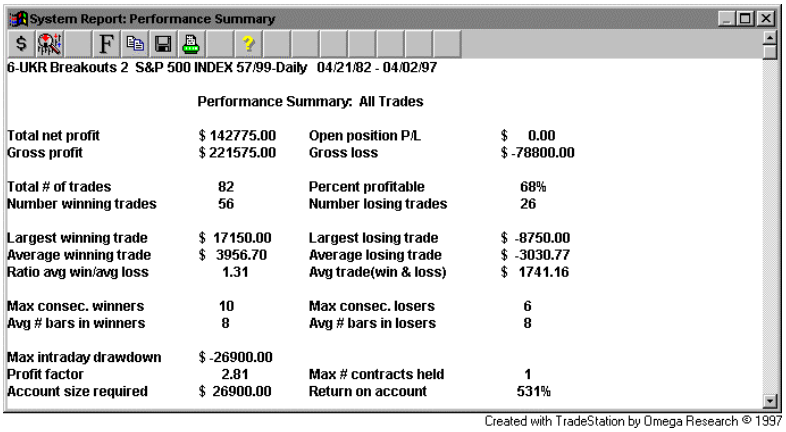
PS 4

There are substantial improvements in every category of this strategy. Clearly there is synergy between the two improvements that we used.

This strategy is actually getting to where we might consider trading it. Now we have several things to consider as we go forward. First, we might want to optimize the parameters, both the number of days that we should hold the trade and the number of days we should go back for the lowest low. Second, we might want to work on the largest losing trade and the drawdown, as both are a little steep for my blood. Let's work on the optimization first.


System Report: Performance Summary

6-UKR Breakouts 2 S&P 500 INDEX 57/99-Daily 04/21/82 - 04/02/97

Performance Summary: All Trades

Total net profit	$ 142775.00	Open position P/L	$ 0.00
Gross profit	$ 221575.00	Gross loss	$ -78800.00
Total # of trades	82	Percent profitable	68%
Number winning trades	56	Number losing trades	26
Largest winning trade	$ 17150.00	Largest losing trade	$ -8750.00
Average winning trade	$ 3956.70	Average losing trade	$ -3030.77
Ratio avg win/avg loss	1.31	Avg trade(win & loss)	$ 1741.16
Max consec. winners	10	Max consec. losers	6
Avg # bars in winners	8	Avg # bars in losers	8
Max intraday drawdown	$ -26900.00		
Profit factor	2.81	Max # contracts held	1
Account size required	$ 26900.00	Return on account	531%

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PS 5

The two best parameters are the low of today being lower than the lowest low of the last 10 days; coupled with holding the trade for 8 days.

The results after optimization, shown in PS 5, clearly show that we are on to something here. We improved a strategy that already was profitable, which fits our criteria for optimization. We also made improvements overall on the strategy. What still bugs me about this strategy is the $8,750 largest losing trade. I don't know if would want to be exposed to that big a trade.

When you scroll through the chart, you can see that the losses are uncontrolled. See Chart 3. The strategy currently does not have any stop loss to limit the risk; the strategy simply exits the market after eight days. This leaves us exposed to the market with no downside protection. For my own trading, I usually want some sort of protection, if only for my peace of mind.

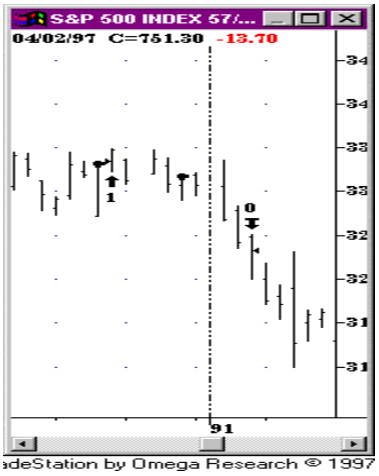


Chart 3

You can see from this chart that there is no stop loss to get us out if the market goes against us. We must simply wait for the eight days.

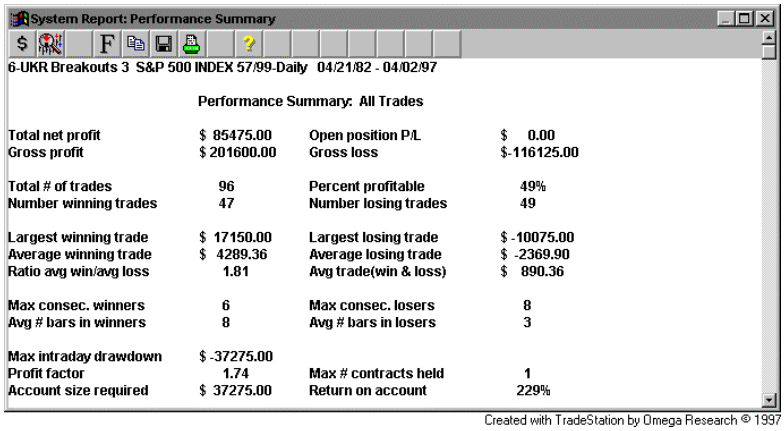
We need to try to fix this because it could be difficult to trade; having a position on with no stop can be very painful.

This is where the money management stops come in. I always recommend that, if possible, you design a money management stop to reflect market action. Usually I try to place money management stops one tick below some recent low. It is only when I haven't been able to find some market action that works, that I try the plain old dollar amount stop. The dollar amount money management stop is always my last resort.

The problem with money management stops is that they invariably interfere with market action. If they are too close, we end up getting stopped out of profitable trades that take a little more room to develop. If they are too far away, you might as well not have one at all. In the end, I just look for a balance. I always know that the performance of the strategy is going to get worse using a money management stop. However, using a stop may permit me to trade a strategy that I would not otherwise feel comfortable trading. This is the tradeoff that you will be forced to make.

In our UKR strategy, the logical thing to try first is to put a stop below the low of the UKR. We know that the UKR represents a volatility type signal that we want to use to take a long trade. It is my first thought that if the low of the bar is violated, the signal is then invalid. Let's see whether the additional stop helps the strategy or makes it worse.

If you look as PS 6, you will note that it pretty much came out as we had expected. The profit was down as we took more losing trades because of the stop. The percentage profitable was also down. Clearly we have made some winners into losers by using the stop. The largest losing trade increased, which is the opposite of what we had wanted, and the drawdown also increased, which is counter to what we had expected. For the most part this was not a great idea.



System Report: Performance Summary

6-UKR Breakouts 3 S&P 500 INDEX 57/99-Daily 04/21/82 - 04/02/97

Performance Summary: All Trades

Total net profit	$ 85475.00	Open position P/L	$ 0.00
Gross profit	$ 201600.00	Gross loss	$-116125.00
Total # of trades	96	Percent profitable	49%
Number winning trades	47	Number losing trades	49
Largest winning trade	$ 17150.00	Largest losing trade	$ -10075.00
Average winning trade	$ 4289.36	Average losing trade	$ -2369.90
Ratio avg win/avg loss	1.81	Avg trade(win & loss)	$ 890.36
Max consec. winners	6	Max consec. losers	8
Avg # bars in winners	8	Avg # bars in losers	3
Max intraday drawdown	$ -37275.00		
Profit factor	1.74	Max # contracts held	1
Account size required	$ 37275.00	Return on account	229%

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PS 6

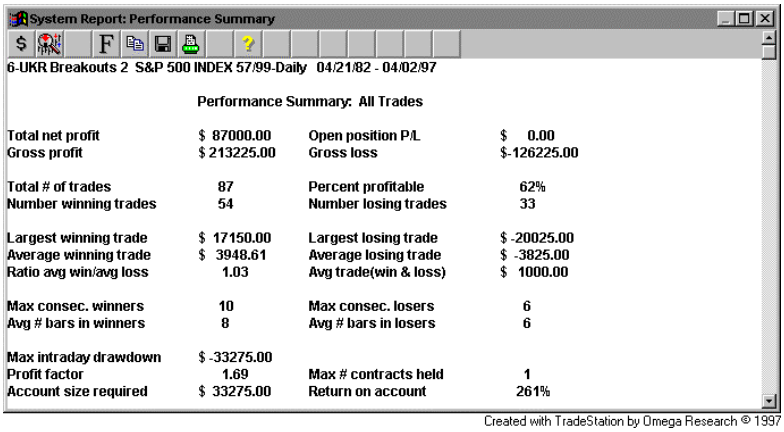
TradeStation EasyLanguage Strategy: UKR Breakouts 3

```
Inputs: BSI(8), LL(10);
Condition1 = Low < Lowest(Low,LL)[1];
Condition2 = Close > Close[1];
If CurrentBar > 1 and Condition1 and
Condition2 then begin
    Buy at high + 1 point Stop;
End;
If BarsSinceEntry(0) = BSI then
Exitlong on Close;
Exitlong("UKR Low") at Value1 - 1 point
Stop;
```

One thing to understand is the details on how testing a stop alters a strategy. If TradeStation is long on an UKR breakout, it will ignore any subsequent signals until it is flat. Even though there may be another UKR breakout two bars after an entry, the strategy will not take it if it is already long.

If, because of placing a stop, as we did in PS 6, the strategy gets prematurely flat, TradeStation will take the next UKR Breakout. This could be a signal that was overlooked in the previous test. Thus we incurred additional trades. We can conclude that using this stop really altered the strategy more than we had wanted. It forced us to take signals that were not taken in the original test.

Since this didn't work, let's try using a straight dollar amount money management stop instead. Since we know from PS 5 that our largest loss is $8,750, reducing that to $5,000 is a reasonable goal, so we'll add a $5,000 money management stop.


System Report: Performance Summary

6-UKR Breakouts 2 S&P 500 INDEX 57/99-Daily 04/21/82 - 04/02/97

Performance Summary: All Trades

Total net profit	$ 87000.00	Open position P/L	$ 0.00
Gross profit	$ 213225.00	Gross loss	$-126225.00
Total # of trades	87	Percent profitable	62%
Number winning trades	54	Number losing trades	33
Largest winning trade	$ 17150.00	Largest losing trade	$ -20025.00
Average winning trade	$ 3948.61	Average losing trade	$ -3825.00
Ratio avg win/avg loss	1.03	Avg trade(win & loss)	$ 1000.00
Max consec. winners	10	Max consec. losers	6
Avg # bars in winners	8	Avg # bars in losers	6
Max intraday drawdown	$ -33275.00		
Profit factor	1.69	Max # contracts held	1
Account size required	$ 33275.00	Return on account	261%

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PS 7

This is the same strategy as in SPF 2 (UKR Breakouts 2) but with a $5,000 Money Management Stop.

If you look at PS 7, you will see that we took another step backward. The most troubling is the largest losing trade moved up to over $20,000. When I see something like this, I have to check it out and find it on the chart. Here's what I found.

As you can see from Chart 4, the strategy got long two days after the crash in 1987. This day in fact was a huge UKR. After getting long and closing at 258.25 on the 21st the market gapped down and opened at 202.00. That's a 56-point loss. And with my luck there probably would have been slippage!

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Chart 4

The day of the 1987 Crash and for a good period of time afterward the stock index future market was very illiquid and volatile. When I test an S&P strategy, or stocks for that matter, I always check and see what would have happened on October 19th and several months after.

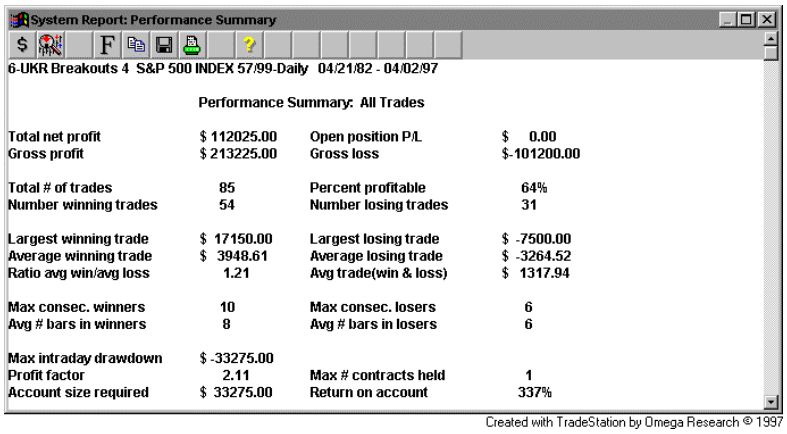
I did not want to trade for several months after the crash, because of the craziness of the market. One way I deal with this is to simply write out the day of the crash and a subsequesnt length of time. For me, I did not feel like getting back in the market until after the first of December.

The TradeStation code for this is:
Condition1 = Date < 871019 or Date > 871201;

The reality is that any stop loss would have been hit on the open as the market opened so much lower. There are two considerations for this trade. First, it is

highly unlikely that you would have put on this trade given the emotions that were bubbling up at this time. The S&P pit itself was in chaos. I personally did not put on any trades for the last few weeks of October, and all of November. Let's see what removing these dates does to the strategy.

PS 8 show the results of eliminating the days after the crash. There is substantial improvement by eliminating just that one trade. This is why you should take a look at the important trades in a Performance Summary. Scroll through the chart and look at the worst couple of trades and the best trades to see if there is anything unusual there. I also look at the periods of the largest drawdown to see if I can learn anything from that period as well. And, be careful when testing the S&P and stocks around the crash of 1987.



PS 8

TradeStation Easy Language Strategy:UKR Breakouts 4

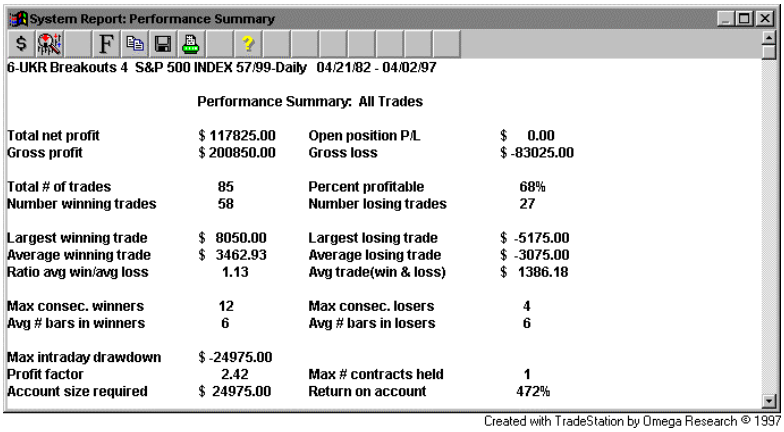
```
Inputs:BSI(8),LL(10);

Condition1 = Low < Lowest(Low,LL)[1];
Condition2 = Close > Close[1];
Condition3 = Date < 871019 or
   Date > 871201;
If Currentbar > 1 and Condition1
and Condition2 and Condition3
then Buy at High + 1 point Stop;

IF BarsSinceEntry(0) = BSI then
Exitlong on Close;
```

The last thing I try before wrapping up a test series is a profit target. There is just something appealing about having a price target in the market and getting out with some money on a short-term basis. When I can get the percentage profitable trades up over 60%, I begin to think in terms of a 1-to-1 risk/reward ratio with a high percentage chance that I will win. So in this case I opted to try a $5,000 price target. This means that when I have $5,000 profit, I will take it.

As you can see from PS 9, there is substantial improvement again. We have moved up to 68% winners with the price target. In this version of the strategy, if I don't hit the target I will either get stopped out with a $5,000 loss or get out 8 days after the entry. The drawdown has come down substantially as we have worked on this strategy.


System Report: Performance Summary

6-UKR Breakouts 4 S&P 500 INDEX 57/99-Daily 04/21/82 - 04/02/97

Performance Summary: All Trades

Total net profit	$ 117825.00	Open position P/L	$ 0.00
Gross profit	$ 200850.00	Gross loss	$ -83025.00
Total # of trades	85	Percent profitable	68%
Number winning trades	58	Number losing trades	27
Largest winning trade	$ 8050.00	Largest losing trade	$ -5175.00
Average winning trade	$ 3462.93	Average losing trade	$ -3075.00
Ratio avg win/avg loss	1.13	Avg trade(win & loss)	$ 1386.18
Max consec. winners	12	Max consec. losers	4
Avg # bars in winners	6	Avg # bars in losers	6
Max intraday drawdown	$ -24975.00		
Profit factor	2.42	Max # contracts held	1
Account size required	$ 24975.00	Return on account	472%

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PS 9

This is Strategy:UKR Breakouts 4 with a $5,000 money management stop and a $5,000 price target.

However, if you look at PS 5, we have done all of this work and have really made only slight improvements. PS 5 was the original version of the strategy with no stops and not targets, just a simple UKR breakout entry with an 8-day exit. All of the work we have done to soothe our psychological problems associated with risk (no stop), largest losing trades and drawdown have not really made us that much more money.

However, we could and should argue that with a $5,000 stop loss and profit target, UKR Breakout 4 in PS 9 is much easier to trade than UKR Breakout 2 in PS 5. We could argue that giving up the profit advantage would be worth the ability to sleep better at night.

And finally, when I get a strategy that looks pretty good, I like to test the final version without any stops. SPF 3 reflects this strategy. I really want to see the financial price I am paying for being unable to trade without stops.

Strategy Parameter File Up Key Reversal Breakout			
Set-Up	UKR – 10 day low		
Entry	Breakout over High of UKR		
Stops	None	Exits	8 day Close & $5,000 Target
MaxBarsBack	50	Slippage	0
Margin	None Used	Commission	0
Data Source	S&P Futures – Omega Research CD		
Data Duration	4/21/82 to 4/2/97		

SPF 3

TradeStation Easy Language Strategy: UKR Breakouts 4

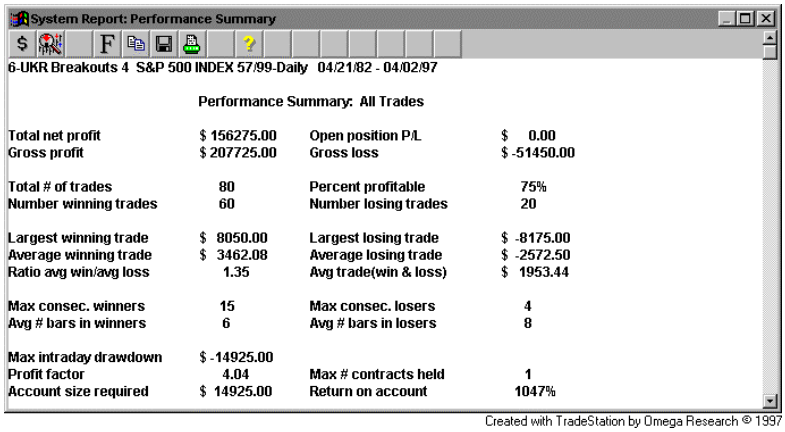
```
Inputs:BSI(8),LL(10);

Condition1 = Low < Lowest(Low,LL)[1];
Condition2 = Close > Close[1];
Condition3 = Date < 871019 or
Date > 871201;

If Currentbar > 1 and Condition1
and Condition2 and Condition3 then
      Buy at High + 1 point Stop;

IF BarsSinceEntry(0) = BSI then
     Exitlong on Close;
```

The results for our last test in this run are shown in PS 10.



System Report: Performance Summary

6-UKR Breakouts 4 S&P 500 INDEX 57/99-Daily 04/21/82 - 04/02/97

Performance Summary: All Trades

Total net profit	$ 156275.00	Open position P/L	$ 0.00
Gross profit	$ 207725.00	Gross loss	$ -51450.00
Total # of trades	80	Percent profitable	75%
Number winning trades	60	Number losing trades	20
Largest winning trade	$ 8050.00	Largest losing trade	$ -8175.00
Average winning trade	$ 3462.08	Average losing trade	$ -2572.50
Ratio avg win/avg loss	1.35	Avg trade(win & loss)	$ 1953.44
Max consec. winners	15	Max consec. losers	4
Avg # bars in winners	6	Avg # bars in losers	8
Max intraday drawdown	$ -14925.00		
Profit factor	4.04	Max # contracts held	1
Account size required	$ 14925.00	Return on account	1047%

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PS 10

These results are from the UKR Breakout 4 Strategy with a $5,000 price target and no stop.

Here is a strategy that is profitable 75% of the time, the drawdown below $15,000 and almost a $2,000 average profit per trade. The price we have to pay for these characteristics is trading with no stop.

Frankly, this is a good strategy. It has all of the performance characteristics that you would want to have behind you to actually trade it. Even if you take out the largest winner, the strategy performance is hardly affected.

Summary

In this chapter, we followed the steps previously outlined to create a strategy. I tried to give you some of the thought process that I go through as I look at the results of each of my design moves. Sometimes there are improvements, sometimes there are none. Bit if you follow the principles, you will stay on the right track.

Conventional wisdom tells us that to make money you have to cut your losses short and let your profits run. This is human nature. This is what we all strive to do, because it is easy to take small losses and big profits. However, as I have said previously, in order to make money trading you have to trade against your human nature.

If we want to trade against conventional wisdom we would actually trade the strategy in PS 10. Why? Because the strategy is designed to manage trades in opposition to our human nature. It limits profits to $5,000 and lets it's losses run for eight days without any stops. After what I have told you, it shouldn't be a surprise that the most profitable version of the strategy is the hardest to trade.

One more caveat. This is a strategy that only takes long trades. The market we tested, the S&P futures, had been in a bull market since its inception in 1982. It is not surprising that we could find a strategy that made money with long trades. The real challenge would be to take the down key reversal and see if we could find a strategy to short this market. Finding a strategy that made money shorting the biggest bull market in history would be a challenge worth taking.

What should we do next? Well, we could keep working on the strategy or add the short signals. We could try other exits, other money management strategies, and other stops. You could literally keep on fiddling with this strategy indefinitely. What I like to do is to take all of the performance summaries, get a cup of tea, put on some Mozart, and contemplate which strategy I could trade and how to make it better.

Could I trade without stops? Note that the drawdown is actually less without any stops. If not, and if I insist on having a stop, how much of a stop? What price am I willing to pay for my human nature?

Next, I would wait for some signals and get a feel for how the strategy works. I would paper trade a few signals to see if they in fact work as I have imagined. I would then trade one or two to get a live feel for the strategy. There is no substitute for putting your money on the line to get a feel for whether or not you could trade the strategy.

After all of the testing and all of the analysis, trading is still a visual undertaking. We still need to get a feel for the market and the strategy in real time. Once we get that feel, we will know which of the versions we should trade and how we might alter the strategy to make it easier to trade.

Chapter 7: Optimization, The Double-Edged Sword

The issue of optimization, or to be more exact over-optimization, has taken on greater importance in the last ten years with the advent of personal computers and software such as TradeStation.

Optimization is the process of using historical data to test the effects of slight changes in indicator or strategy criteria. The goal of optimization is to uncover the most profitable or optimal setting for a particular indicator or price pattern traded on a particular security. If, for instance, we want to trade a moving average strategy on Coffee futures, we might arbitrarily pick the 18-period moving average and design a strategy around it. Or, we could test all the moving averages between 1 and 50 and pick the most profitable. This latter process is what is called optimization.

Ever since I have been trading, there has been a continuing debate as to whether optimization is a valid process. There are strong opinions on both sides. The basic controversy centers on the argument that the results of a historical test are not valid because the market never does the exact same thing twice. The market prices will never exactly move in the future as they have in the past.

One side of the argument says that because prices will never move exactly the same, optimization is really fitting the strategy to historical data and is therefore a useless process that simply serves to give historical performance data that is irrelevant in the future. The anti-optimization argument goes on to say that if the trading method has been exactly "fitted" to the historical data, it stands to reason that the technique will not work in the future because future data has no relation

to past data. The traders that take this position usually opt for "soft" trading methods such as the Elliott Wave, Gann techniques, the Market Profile or other generally intuitive approaches to trading.

The irony is that the individuals who decry the perils of optimization also use a type of historical testing to see if their techniques have worked in the past. These soft techniques are "back-tested" by looking at historical charts and estimating where and under what circumstances they would have made a trade. It is very easy to curve-fit the Elliott Wave theory and Gann techniques to historical data, but very difficult to trade them in real time.

I have never seen any performance statistics for those who trade the Elliott Wave or other soft techniques that are superior to the average, statistically sound (and optimized!) trading strategy. Ponder this very important point.

Check out the Commodity Traders Consumer Report, the Hulbert Digest or other trading and investing rating services. What you will find is that all of these trading advisors have trading statistics that are no better than an average trading strategy.

Most of those who argue in favor of optimization do realize that there is a risk of over-optimizing. But our solution is to minimize the chances of over-optimization and curve fitting rather than not use it altogether. Just because over-optimization is a risk does not mean that you should throw the baby out with the bath water and not optimize at all. Just because there is a risk of an accident does not meant you should not drive a car. You just have to know the risks and be careful.

We have to start with the assumption that back testing using quantifiable historical data is a valid method for analyzing price activity and projecting trading profits for stocks and futures, despite the risk of curve-fitting. The reason we make this assumption is that historical data is all we have to go by.

If you think about it, all investments are bought and sold based on some type of historical record. Before we make any investment, we want to see an historical track record. We want to know what return the particular investment advisor has achieved over the last few years in relation to the Dow Jones Average. We want to see how the venture capital fund's investments have performed over the last few years, or the history of the fund. We want to know how real estate has fared in the area we are buying, and whether the developer has achieved profits on the last few projects.

Sales pitches for common stocks point out the average 15% or so annual return over the last *x* number of years. The perennial futures strategy seller promotes the

strategy based on the historical track record, either an actual or simulated performance history. And the arguments are similar for numismatic coins and precious metals, bonds and asset allocation strategies, etc.

The sales pitch for all investments is either the trend argument, that the trend is up and will continue up and you should purchase the investment, or the long-term support argument, that the price is at an historic low and the item is so cheap you should buy it now. Both of these arguments reference historical data. You simply can't get away from it.

The reason historical data is used for investment analysis is that there really is no other way to analyze an investment. You find quantifiable historical data and simulate how you would have done if you had taken trades or made investments based on certain techniques. Even those traders who rely solely on fundamentals for trading and investing do so after analyzing how certain fundamentals have affected markets in the past.

In the final analysis, a trading strategy is just another investment, another place to put your money to work with the expectation of above average returns. But there is no logical reason to single out strategy testing and development simply because it tests the return on investment over historical data. All investment analysis uses historical data projected into the future.

I always assume that the market will never move in exactly the same manner twice. If markets were predictable, it would be a simple exercise to find historical patterns and trade them. More people would be successful traders. More traders would make money.

We do not conclude, however, that because of this reality historical testing, optimization, and strategy trading become invalid. Just because the market will not move in exactly the same manner as it has in the past, does not mean that historical testing and strategy trading becomes unsupportable.

Just as a five-year plan for a manufacturing business is undoubtedly not going to unfold exactly as projected, neither is your trading strategy going to unfold exactly as it has in the past.

But even with the risks of over-optimization, the advantages of strategy trading significantly outweigh spending your time learning and trading "soft" techniques. Strategy testing gives you the framework for planning cash flows, projecting

profits, and doing some planning for your trading business. "Soft" techniques do not allow for any planning or projections because their results are not only unpredictable, but also based on non-objective trading judgements.

Your banker would not lend you money for a business without a projection of future cash flow. You would project those cash flows based on either the past history of your company's cash flow or standard cash flow statistics of similar businesses. You would actually base the cash flow projections on history, and they would be "optimized" into the future making best case assumptions about sales and expenses.

If you went to a banker without projections based on past history, and without "optimistic" projections, he would probably think something was wrong with you and not lend you the money. All of the arguments about the dangers of "over projecting" would probably not sway him to give you the money. And if you told him you would repay him because you can project the cash flow of your company using the Elliot Wave Cash flow theory and Fibonacci retracements of your sales figures, he would probably show you the door.

The point is that financial projections based on historical data and optimization of cash flow is a standard and required business procedure. Most successful business people understand the risks of these projections, and understand that this doesn't make them useless or irrelevant.

The real issue then is how do you know if a strategy is over-optimized? What are the signs of a curve-fitted strategy?

You know that a strategy is over-optimized and curve-fitted if it misses the move for which it was designed. If you are trading a trend-following strategy and it misses a big move, the strategy is probably curve-fitted to past data. The excess curve- fitting caused the strategy to miss a big move that did not occur exactly as it had in the past.

Unfortunately, this is the only real way of knowing whether your strategy is over-optimized. You must trade it into the future and monitor its performance to make sure it is doing what you designed it to do. It is important to minimize the problem by understanding the role of optimization in strategy testing and the best ways to avoid it, as outlined in this chapter.

Strategy Refinement not Creation

Optimization is one of the last steps in developing your trading strategy. It can be thought of as using a computer to manipulate the parameters of your strategy and then comparing the results of these different parameters.

During strategy development, you are not ready to optimize unless you have a strategy that makes money in its crude form. If your strategy has been tested and you are happy with it, but you feel that altering inputs a bit could make it more powerful, then you are ready to optimize. Optimization is a process used to refine a sound strategy.

Before you start the optimization process, your strategy should be very close to being finished. Many people make the mistake of taking an unfinished strategy and trying to optimize it to complete it. Even more people try to optimize a strategy as their first step! This will only cause you frustration, because optimization will not give you new ideas about what your strategy needs to make it profitable. Optimizing will only take what you already have, and then tell you what parameters will work best with that strategy. In order for optimization to be effective, your strategy should already be making money on your test data when you start the optimization process.

Optimize your strategy in the same manner in which you back-tested your strategy. The optimization should be performed on the same data groups that you used for testing. To get an accurate picture of how changes affect your strategy, change only one parameter or setting in your strategy at a time. For example, change the length of the fast moving-average and see what the results are. When you find an acceptable value, then change the length of the slow moving-average and do the same tests. Generally, when you optimize, adhere to the same standards that you found were important in your historical back testing.

Really, the only difference between historical back testing and optimization is the state of your strategy when you begin each step. When you started testing, your strategy was in its infant stages, and when you optimize, your strategy should be near completion.

Minimize the Dangers of Over-Optimization

There are some steps you can take to minimize the chances that your strategy will be over-optimized. I use this checklist for each strategy that I create to remind myself that curve fitting is a real danger and I have to be cautious while optimizing a strategy.

DEVELOP YOUR STRATEGY BASED ON A MARKET THEORY OR IDEA

Think through the rationale behind every technique and make sure it makes market sense. You should always be able to explain to someone how this indicator works and why this strategy makes money. You must be able to describe the rationale behind the indicator, the entries, and the strategy itself.

This is in direct opposition to simply taking a few moving averages (or some other indicator) and searching for the best parameters. To pick an indicator that you don't understand and does not make market sense and optimize for the best parameters is a real prescription for failure. Make sure your indicators and signals are logical and are designed to capture the market activity that you intend.

KEEP THE STRATEGY SIMPLE

One of my observations over years of strategy development is that profitability of a strategy is inversely proportional to its complexity. Keeping this rule in mind, you should avoid too many signals.

Each additional signal you add to the strategy increases the possibility that all of the signals together, in combination, are curve-fitted for the particular historical data. So keep the number of signals in your strategy to a minimum to assure that in combination they are not over-optimized on the data.

USE THE CONCEPT OF SET-UP AND ENTRY

As I have stressed throughout this book, your chances of producing a sound profitable strategy are dramatically improved by using the concept of set-up and entry. This is the one technique that will help to ensure that you are not making major mental mistakes.

MAKE SURE THE STRATEGY WORKS ON A VARIETY OF SECURITIES

You should be suspicious of a strategy that works well on only one stock or one futures contract. Having said that, there are two schools of thought about this.

The first school is convinced that for any strategy to be valid it must work on a wide variety of futures contracts and stocks, and if it does not, it is not a valid strategy.

The second school of thought believes that each commodity family or stock industry group has a unique personality, and that a strategy can be specific to that particular group. For instance, a strategy that works well with the currencies may justifiably have different parameters than one that works on the grains. But it must work well on most of the currencies.

I think it is best to take a practical approach to this problem and not get all caught up in the theory. That's why I suggest a course of action that should help you develop a strategy specific to your own needs, rather than force you to take a position on either side of this issue.

I recommend that your strategy should be profitable in a wide variety of commodities or stocks, but it does not have to be the optimal strategy for all of them. An example would be if you have developed a trend-following strategy that works well for the Swiss Franc. First, you would want to make sure that it works for other currencies, for example, the Japanese Yen, the Deutsche Mark, and the British Pound. You would also want to ensure the robustness of the strategy by testing it on Crude Oil, or T-Bonds, and maybe a metal or grain.

That is not to say however that the strategy has to be the optimal for each stock or commodity, or that it has to be profitable on all securities. The goal is to test in on a wide enough variety of commodities or stocks so that you feel comfortable that the strategy design is good enough to transcend the commodity or stock industry group.

LOOK AT SURROUNDING PARAMETERS

This is a consideration that is very important and a trap into which many new strategy designers fall.

Let's say that you have come up with a strategy for the software industry that not only works on the index, but also works on most of the stocks. The optimal length for the indicator turns out to be 17. The first thing you should look at is if the surrounding parameters are also profitable. Check the 14,15 and 16 lengths.

Are they also profitable? What about the 18,19 and 20 lengths? These should be profitable as well.

If any of the close parameters on either side of the optimum is not profitable, this should be major red flag that you have over-optimized or that there is a significant flaw in the strategy. If the length of 17 was the only profitable parameter out of the lengths on either side, there are probably one or two trades that were taken that caused this anomaly. This strategy is extremely suspect and a great deal more investigation should be done.

If, on the other hand, all surrounding parameters are profitable, although admittedly not as profitable, you can be reasonably assured that you have not curve-fitted the strategy and that it is robust.

DO SOME FORWARD AND BACKWARD TESTING

Forward testing takes the optimal parameters form the past and carries them forward into the more recent past. For example, you could find the optimal parameters from 1982 to 1992, and then test these parameters from 1992 to the present. If the strategy was profitable when carried forward, you have increased the reliability of the historical results.

I also back test. I optimize for the most recent 7 to 10 years and then test these parameters in the 10 years before that. For example, I might do an optimization for 1990 to 1995 and then back test it from 1985 to 1990.

The third part of this technique is to be creative and literally mix it up. Optimize for 3 or 5 years here and then test it there. The more mixing up you can do, the more information as to the best parameters you will get, and the more confidence you will have in your strategy.

Table 1 is a summary of the steps for minimizing the dangers of over-optimization. The first three are mental concepts that you should use as you intellectually organize and develop your strategy. The second three are practical considerations to keep in mind as you test your strategy. If you use all of these techniques, you should greatly reduce the chances of over optimizing your strategy.

Minimize the Dangers of Curve Fitting
1. Base strategy on market theory and observation
2. Avoid too many entries and exits
3. Use set-up and entry
4. Test a variety of markets/stock industry groups
5. Forward and backward test
6. Look at surrounding parameters

Optimization can move your strategy from being profitable to being extremely profitable. It is a valuable tool that allows you to play with the parameters of your strategy without changing its core functions. Optimization can answer such questions as, "What is the best fast moving-average length to use?" Many people mistakenly use optimization to force an incoherent strategy towards completion. When used correctly to fine-tune a sound, profitable strategy, optimization is an important step that is necessary to prepare your strategy for real-time trading.

The Optimization Process

Let's look at the process of optimization. Before we optimize, we need a trading idea. Then we need to design a sound, profitable strategy. Once we have tested the strategy and are sure it is profitable, then and only then will we consider optimization.

TRADING IDEAS

The strategy creation process itself is a wonderful source for ideas. It is not unusual for me to accidentally fall into something that works as I am working on some other idea.

In Chapter 4, we were working on set-up and entry, and we ended up using the highest high of the last 50 bars and the lowest low of the last 50 bars to guarantee that we would always be in for the big move. When we looked at the summary in Table 1 in Chapter 4, we found that this component of the strategy performed very well on its own. We then put this in our arsenal of ideas to test in future. And here we are.

The appeal of using the highest high and the lowest low is that this technique is very simple trend-following technique, and it meets all of our set-up and entry criteria.

First we find the highest high of the last 50 bars. Then we put a buy stop one tick above that price. When the prices move through that particular price, we enter into a long position. We use the same procedure in reverse for the short side.

The set-up for our strategy is the designation of the actual highest high (or lowest low) of the last 50 bars. We assume that if the price moves through either of these prices, the trend has changed.

The entry is a price move through this price point. This breakout entry fits both our entry rules. The price movement confirms the direction of the set-up (Entry Rule #1) and since it is a reversal order and we are in the market at all times, it also ensures that we will never miss the big move (Entry Rule #2).

Chart 1 is a weekly chart of the Dow Jones Industrial Average with the highest high ("HH") of the last 50 bars and the lowest low ("LL") of the last 50 bars as a price channel. The entries are flagged where the strategy took a long position as it passed through the upper channel line and went short as it passed through the lower channel line.

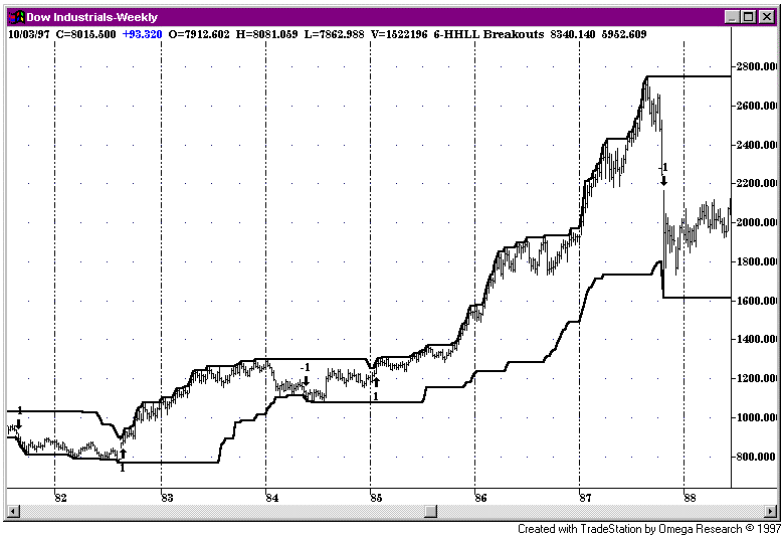


Chart 1

TradeStation Easy Language Inidcator: HHLL Breakouts

```
inputs:HH(50),LL(50);

Plot1(Highest(High,HH)[1],"HH");
Plot2(Lowest(Low,LL)[1],"LL");
```

As you can see in Chart 1, each time the price of the Dow moved through the highest high channel or lowest low channel we had a change in position. Also, you will notice that the strategy gets in for all of the big moves. It was long from 1982 through mid-1984 and again from early 1985 through the crash of 1987.

To enter the market, the price only has to reach one tick above the 50-week high, or one tick below the 50-week low. Once either of these prices is hit, which is technically on a stop order, we would be long or short. This strategy is always in the market. We will never miss a big move.

SPF 1 is the Strategy Parameter File for this strategy. I have arbitrarily picked 50 weeks as the length for the highest high and the lowest low. But this may not be the optimum length. I picked 50 periods because I happened to remember that I read somewhere that a breakout to a new annual high is significant in the stock market. Remember, I thought that 50 periods was close enough to a year so I just arbitrarily went with that number.

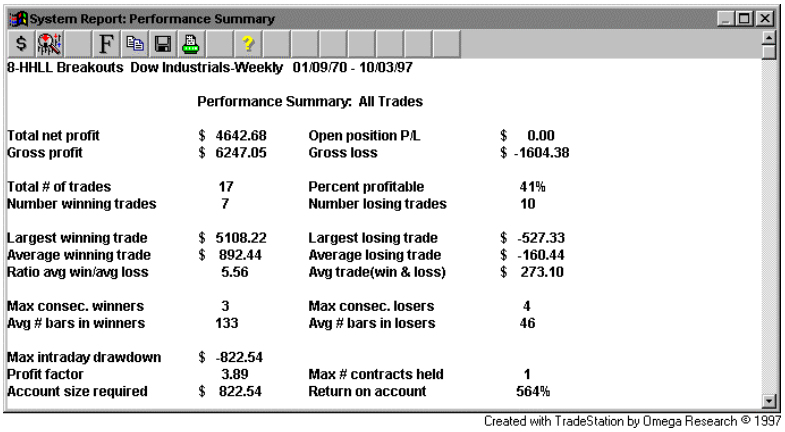
Strategy Parameter File HH LL Breakouts			
Set-Up	50-Period Highest High or Lowest Low		
Entry	Breakout over HH or under LL		
Stops	None	Exits	None
MaxBarsBack	50	Slippage	0
Margin	None Used	Commission	0
Data Source	Dow Jones Industrials – Dial Data		
Data Duration	1/9/70 to 8/8/97		

SPF 1

Obviously you are not able to trade the Dow Jones Industiral Average. In this case we would use this as a proxy to either buy or sell stocks or mutual funds, or to buy or sell a basket of stocks.

You would be long stocks when the strategy was bullish. You would be short or out of the market when the strategy was bearish.

The performance results of this strategy are in PS 1. As you can see, this strategy performed reasonably well.


System Report: Performance Summary

8-HHLL Breakouts Dow Industrials-Weekly 01/09/70 - 10/03/97

Performance Summary: All Trades

Total net profit	$ 4642.68	Open position P/L	$ 0.00
Gross profit	$ 6247.05	Gross loss	$ -1604.38
Total # of trades	17	Percent profitable	41%
Number winning trades	7	Number losing trades	10
Largest winning trade	$ 5108.22	Largest losing trade	$ -527.33
Average winning trade	$ 892.44	Average losing trade	$ -160.44
Ratio avg win/avg loss	5.56	Avg trade(win & loss)	$ 273.10
Max consec. winners	3	Max consec. losers	4
Avg # bars in winners	133	Avg # bars in losers	46
Max intraday drawdown	$ -822.54		
Profit factor	3.89	Max # contracts held	1
Account size required	$ 822.54	Return on account	564%

Created with TradeStation by Omega Research © 1997

PS 1

TradeStation EasyLanguage Strategy: HHLL Breakouts

```
Inputs:HH(50),LL(50);
IncludeStrategy:"Exit on 8/8/97";

Buy("hh") at Highest(High,HH)
+ 1 point Stop;
Sell("ll") at Lowest(Low,LL)
- 1 point Stop;
```

Although the performance is OK, I have a couple of concerns. First, from 1970 to 1997 the Dow gained 7,200 points, moving from roughly 800 to approximately 8,000. The strategy captured 4642 points or almost 65% of the move. I would like to see more. Nevertheless, the trend trader's goal is to capture most of the middle of the move, and this strategy accomplished that goal.

Second, if you look at Chart 1, you will see that the strategy got short right at the bottom of the 1987 crash. Even though it was a profitable trade, I would have preferred an earlier exit. This is a problem we will need to deal with. There was nothing else that concerned me when I scrolled through the strategy looking at the entries and exits with TradeStation.

Now, we need to see if optimizing the lengths of the highest high and lowest low would improve the performance. Our first concern is that the strategy in its raw form is profitable and that we not optimize to make a strategy profitable, but to improve its profitability. We are OK because this strategy is pretty good as it is.

Another major strategy consideration for me is trying different lengths for the buy side and the sell side. You might be tempted, as I have been, to keep the buy length and the sell length the same. However, over the years I have found that generally it is much more profitable to separate the two.

In most cases, you will find that the more profitable strategies have shorter lengths for the long side. I have pondered this phenomenon for many years and have concluded that it just takes markets longer to go through the topping process than to make a bottom. In almost every strategy I have tested, the optimal parameters for the sell side were longer than those for the buy side. Let's see how it works with the HHLL strategy.

The Strategy Parameter File is exactly the same as in SPF 1 except that we put in a range of values for the HH and the LL. For this test, I used from a length of 5 to 50 with an increment of 5, for both the HH and the LL. The results are in Opt Table 1.

HHLL 1/1/70 to 8/8/97									
HH	LL	Net	Long	Short	P-Fact	ROA	MAXD	#	% Prof
5.00	50.00	6285.12	6793.35	-508.23	5.91	1338.74	-469.48	31	39
5.00	45.00	6201.21	6751.39	-550.18	5.64	1280.62	-484.23	33	36
20.00	50.00	6146.20	6723.89	-577.68	7.20	1094.61	-561.50	17	53
15.00	50.00	6117.93	6709.75	-591.82	7.02	1247.99	-490.22	19	53
5.00	40.00	6067.82	6684.69	-616.88	4.91	1193.58	-508.37	39	31
20.00	45.00	5928.84	6615.21	-686.37	6.20	1055.90	-561.50	19	42
15.00	45.00	5917.21	6609.39	-692.18	6.15	1207.04	-490.22	21	43
15.00	40.00	5902.99	6602.28	-699.29	5.77	1204.14	-490.22	23	39
10.00	50.00	5894.49	6598.03	-703.54	5.30	1171.13	-503.32	27	37
20.00	40.00	5887.66	6594.62	-706.96	5.69	1048.56	-561.50	21	38

Opt Table 1
TradeStation Optimization Strategy: HHLL Breakouts

Buy: 5 to 50 by 5
Sell: 5 to 50 by 5

Note: None of the parameters on the short side were profitable. This makes sense since we have been in a bull market for at least the last 15 years.

The best lengths for the HHLL breakouts were 5 on the buy side and 50 on the sell side. That means that you would buy at the Highest High of the last 5 bars and sell at the lowest low of the last 50 bars. I have printed out as Opt Table 1 some of the performance data. It is sorted for the best Net Profit, but we could have sorted it for any of the performance criteria

The next best parameters are the 5/45 but this is so close to the 5/50 that I basically would just throw it out. The third best parameter is the 20/50. This is a real possibility. So I would at this point just focus on these two options.

One major note, at this point we can conclude that since all of the top ten parameter choices are very close, we have met the criteria that the surrounding parameters are profitable. If we wanted to, we could do a more detailed test for this, but I don't feel it would be necessary at this point.

Another major observation is the number of trades and the % profitable. The 5/50 parameters have 31 trades with 39% profitable. The 20/50 parameters have 17 trades with 53% profitable. Which of these would be easier to trade? The profits, $6,285 and $6,146 respectively, are close enough to be indifferent. So, if we conclude that the profits are close enough, I would prefer a 53% shot with less trades than a 39% shot with almost double the trades.

The drawdown comparison between the two is also so close that I would call it a draw. The 100 points over a 27-year period are just not enough to get worked up about. But the profit factor is important. A 7.2 versus a 5.9 profit factor is significant, and enough again to argue for the 20/50.

OK, so I am now convinced that the 20/50 is the parameter lengths of choice.

Do you think that if we looked at different decades this would hold true? Do you think that the optimal parameters for the 1970s would be the same as the 80s and 90s? What if all of the profits from the 5/50 parameters were made in the last 10 years, or the first 10? Let's check out the different decades, starting with the 1970s in Table 2.

1/1/70 to 1/1/80

HH	LL	Net	Long	Short	P-fact	ROA	MAXD	#	%
20.00	**50.00**	325.48	166.66	158.83	2.71	133.79	-243.28	7	57
40.00	50.00	245.41	126.62	118.79	6.06	227.02	-108.10	5	80
20.00	30.00	225.38	104.80	120.57	1.77	69.94	-322.27	9	44
25.00	50.00	200.62	104.23	96.40	1.90	76.11	-263.61	7	57
20.00	35.00	178.81	75.07	103.75	1.56	53.51	-334.17	9	44
15.00	50.00	159.17	83.50	75.67	1.52	46.40	-343.06	9	56
45.00	50.00	158.11	82.97	75.14	4.26	146.26	-108.10	5	80
20.00	25.00	132.18	58.20	73.97	1.32	44.78	-295.19	11	36
50.00	50.00	129.72	68.78	60.95	3.46	115.46	-112.35	5	80
20.00	40.00	129.05	50.19	78.87	1.38	36.37	-354.82	9	33

Opt Table 2

The 1970s

Opt Table 2 shows that in the 1970s, the 20/50 lengths were the most profitable. If you scroll the chart of the 1970s, you will see that it was indeed a trendless, sideways market with major bull and bear markets. Support/resistance traders made good money in the '70s but were crushed with the bull market of the '80s. The fact that the 20/50 made money in the '70s is impressive given it is a trend-following strategy trading in a sideways market.

HHLL 1/1/79 to 1/1/90

HH	LL	Net	Long	Short	P-fact	ROA	MAXD	#	%
5.00	15.00	1720.75	1817.40	-96.64	2.85	546.58	-314.82	27	37
15.00	15.00	1412.84	1663.44	-250.60	2.69	386.21	-365.82	19	47
10.00	15.00	1356.45	1635.25	-278.80	2.35	358.54	-378.32	23	39
30.00	15.00	1312.14	1613.09	-300.95	2.65	358.69	-365.82	17	41
20.00	15.00	1280.26	1597.15	-316.89	2.48	347.22	-368.72	19	47
25.00	15.00	1222.70	1568.37	-345.67	2.38	321.63	-380.16	19	42
35.00	15.00	1216.64	1565.34	-348.70	2.53	332.58	-365.82	17	41
40.00	15.00	1201.28	1557.66	-356.38	2.51	328.38	-365.82	17	41
45.00	15.00	1201.28	1557.66	-356.38	2.51	328.38	-365.82	17	41
50.00	15.00	1196.53	1555.28	-358.76	2.51	327.08	-365.82	17	41

Opt Table 3

The 1980s

In Opt Table 3 for the 1980s, we see that the '80s were a very different market for this strategy. The best parameters all had lowest low parameters of 15. Since the LL parameter of 15 did not show up in the '70s or in the overall test, I look at these numbers as unusual. I really can't make any judgement about these numbers until I look at the '90s.

HHLL 1/1/89 to 8/8/97									
HH	LL	Net	Long	Short	P-fact	ROA	MAXD	#	%
5.00	40.00	5316.72	5369.01	-52.29	22.23	1441.88	-368.74	3	33
5.00	45.00	5284.45	5352.88	-68.43	19.69	1317.82	-401.00	3	33
5.00	50.00	5284.45	5352.88	-68.43	19.69	1317.82	-401.00	3	33
10.00	40.00	5258.32	5339.81	-81.49	19.81	1231.07	-427.14	3	33
10.00	45.00	5226.05	5323.68	-97.63	17.76	1137.58	-459.40	3	33
10.00	50.00	5226.05	5323.68	-97.63	17.76	1137.58	-459.40	3	33
15.00	40.00	5122.18	5271.74	-149.56	15.73	1203.36	-425.66	3	33
20.00	40.00	5116.72	5269.01	-152.29	15.60	1316.92	-388.54	3	33
15.00	45.00	5089.91	5255.61	-165.70	14.40	1111.53	-457.92	3	33
15.00	50.00	5089.91	5255.61	-165.70	14.40	1111.53	-457.92	3	33

Opt Table 4

The 1990s

The 1990s are delineated in Opt Table 4. Note that the LL parameters are back in the 40s and 50s and the HH parameters are between 5 and 20. What this tells me is that the '80s were unusual. It also tells me that the 20/50 would be OK in the '90s although not in the top ten.

So, now let's put together the whole picture for the 20/50. This is in Opt Table 5.

HH	LL	Net	Long	Short	Pfactor	ROA	MAXID	# TR	% PR
1970s									
20.00	50.00	325.48	166.66	158.83	2.71	133.79	-243.28	7	57
1980s									
20.00	50.00	777.87	1345.95	-568.09	2.23	138.53	-561.50	9	44
1990s									
20.00	50.00	5084.45	5252.88	-168.43	14.29	1208.28	-420.80	3	33
Total									
20.00	50.00	6146.20	6723.89	-577.68	7.20	1094.61	-561.50	17	53

Opt Table 5

You will note that the individual performance summaries don't add up to the total, and add up with more trades.

This is because the 1980s and 1990s starts flat and and gives us two extra trades. This is nothing to be concerned about.

Note that these parameters are profitable in each of the decades, and that the big profits came from the trades in the 1990s. Thus the strategy parameters that we picked, the 20/50 were profitable in each decade in three completely different markets; we also caught the big moves.

This strategy would work particularly well if you were only going to use it for long trades. Get long on the 20-week upside breakout and get out of the market on the 50-week downside breakout. You could then either buy a mutual fund, or purchase stocks based on the same indicator. The combinations are limitless.

You might also try other entries. One interesting technique is to not buy an intra-week breakout but insist that the week's close be above the 20-week high or below the 50-week low. This requirement would have eliminated the short in the week of the 1987 crash. The downside to this is technique is that it sometimes gets you in the move very late. So you would have to analyze the tradeoff for yourself and see if it makes sense.

Summary

So did we minimize the negative effects of optimization? Yes, we did.

First, we based the indicator on market theory and observation in that we knew that breaking into a new high for the last year is significant in the stock market.

Second, we only have one entry and exit and they are easy to understand. So our strategy is not overly complex.

Third, we used set-up and entry and made sure we followed the set-up and entry as we created the strategy.

Fourth, I scrolled through each of the Dow stocks after applying this strategy and found that only three lost money and a couple of them were close to breakeven. So on 25 of the 30 Dow stocks, this strategy worked great. I also ran through some high tech stocks and they worked great as well. As long as you picked your stocks well, and chose stocks that trend with the Dow, you did well.

I then scrolled through weekly charts of the commodities on the Omega Research Historical Data CD. Almost all of them were profitable. There were many that you might not want to take the drawdown, and some with a low percentage profitable trades. But for the most part this strategy is universally sound on other stocks and commodities. It passes the fourth test.

Fifth, we looked at each decade, and chose our parameters based on the performance in each decade. This is not the only way to do backward and forward testing, but it is a sound practice. This is my short way of testing in the '70s and trading in the '80s, etc. We certainly could have optimized and rolled forward, but I use this technique because it gives me more useful information.

And we know that the surrounding parameters were profitable. We could perform additional tests for this, but it was very clear from all of the tests we did look at that the surrounding parameters are profitable. As a matter of fact, all of the parameters were profitable. This is the sign of a very robust strategy.

So was optimization worthwhile? Would you rather trade the 20/50 than the 50/50. I would.

Did we over-optimize? Can we be accused of curve-fitting the strategy to historical data? With all of the data we looked at and knowing the performance changes with the differing markets, I would say no. We are going into trading this strategy with our eyes open—we know the type of markets in which this strategy works best and those in which other parameters would be better.

Optimization is a tool that can greatly enhance your knowledge of each strategy—your knowledge about what works in different types of markets—and give you confidence that even if your trading gets tough, you will know what to expect. This is what running a business is all about.

Chapter 8: The Science of Strategy Evaluation

The science of strategy evaluation has two basic parts to it. The first part is the evaluation of the financial aspects of the strategy. How do we measure profitability? Is a particular trading strategy a better place to put your money than alternative investments or businesses?

The second part of strategy evaluation is more personal in nature. The strategy must be evaluated in light of the person who will be doing the actual trading. This is what I call statistical evaluation. Does the historical performance make this strategy acceptable to the personality and trading style of the individual trading it? Does this trading strategy have characteristics that will allow the person to trade it effectively and have the discipline to execute it? Will the trading of this strategy provide too much emotional stress? The statistics will tell us.

And finally, it is important to know when your strategy has stopped working.

Financial Evaluation

There are two ways to evaluate a strategy financially. First a strategy may be evaluated on its own merits as compared to alternative forms of investing. That is, the return on invested capital over a period of time. How does the particular trading strategy stack up as compared to T-Bills, common stocks, etc?

Second, a strategy should be evaluated financially on its own merits. This means is it viable as a trading strategy as compared to other trading strategies? Does Strategy A provide a better return than Strategy B?

RISK-FREE RATE OF RETURN

The place to start when contemplating a trading strategy is with the risk-free rate of return. This is the return you would expect to receive on an asset that is virtually risk free. Most analysts use the 90-Day US Treasury Bill rate as the risk-free rate. And while it could be debated as to whether the debt of the US Government is risk free, it is a close as we can come.

The first and most obvious principle is that any strategy must provide a greater return than the 90-Day T-Bill rate, or you would simply be better off just putting your money in T-Bills.

However, you must also assess the return that you will require of the strategy in order to compensate you for the added risk. How much income over and above the T-Bill rate is required to entice you to take your money out of T-Bills and put it into a trading strategy? You should assess the premium that you will require for trading a particular strategy.

As the risk is greater for trading stocks and futures, this premium should be quite large. I have always recommended that for stocks you should at least double the T-Bill return rate, and for futures you should require four times the T-Bill return. If the T-Bill rate is 6%, I would require at least a 12% return per year for stocks and at least 24% per year for futures before I would consider taking my money out of T-Bills and putting it in these markets.

If the current T-Bill rate were 10%, I wouldn't be interested in a strategy for futures that did not return at least 40% per year. If the historical testing did not indicate that this 40% return was possible, I would keep my money in T-Bills.

Ultimately, you must determine your own risk premium. Take some time to think about what you consider to be a reasonable return for your trading efforts. It might not be my four times the T-Bill rate; you might only require three or two times. But if you are not compensated for the increased risk, it is more prudent to place your money elsewhere.

Also note that using my recommended approach permits the required rate of return to change over time in that there have historically been large swings in the T-Bill rate. In times of high inflation, like during the late '70s, the T-Bill rate generally rises, thus requiring a higher return for your trading account. In times of

low inflation, the T-Bill rate lowers and therefore you would not require as high a return from your commodity or stock trading accounts.

In times of high inflation, the volatility of most stocks, commodities and futures increases, thus providing the opportunity to profit from this increased volatility. You must make sure that that your strategy will provide the necessary return in different financial environments (high or low inflation, recession, etc.).

THE INVESTMENT

I believe that the decision to place money in a trading strategy either for futures or stocks should be made with the same due diligence and financial analysis as putting your money in any investment. What is the expected return on investment? What are the relative risks to achieve the expected return?

Creating a strategy and running historical tests is no different than investing in real estate, leases, mortgages or even junk bonds. All investments are sold to the public by presenting the expected rate of return and estimated risks. These returns are evaluated by looking at the past history of the investment and making assumptions that the future will be similar to the past.

Devising a trading strategy and implementing it is no different. We run historical tests and make assumptions that the future will be similar to the past. Although we intuitively know that it won't be exactly the same, we make the assumption that it will be close enough to induce us to risk our funds on this strategy.

Before we can calculate a return on investment figure, we need to determine just what our investment is. The place to start for futures is with Maximum Intra-Day Drawdown (MAXID).

I consider the MAXID to be my investment in my strategy. If you were to operate any type of business, you would have to invest money in facilities, inventory, and labor before any revenue came in. Then, you would calculate your profits as a percentage of this investment.

THE RETURN ON INVESTMENT

In trading strategies, to evaluate the return on investment I use what I call ROMID—Return On Maximum Intra-day Drawdown. I view MAXID as the investment and calculate my return based on this number.

Futures margin should not be included in the calculation of the investment for three reasons. First, since it is now standard practice to keep margin in T-Bills, it

is redundant to use margin in the calculation for ROMID. We should either eliminate the margin or include the interest earned on the T-Bills to calculate the return on investment. I eliminate the margin.

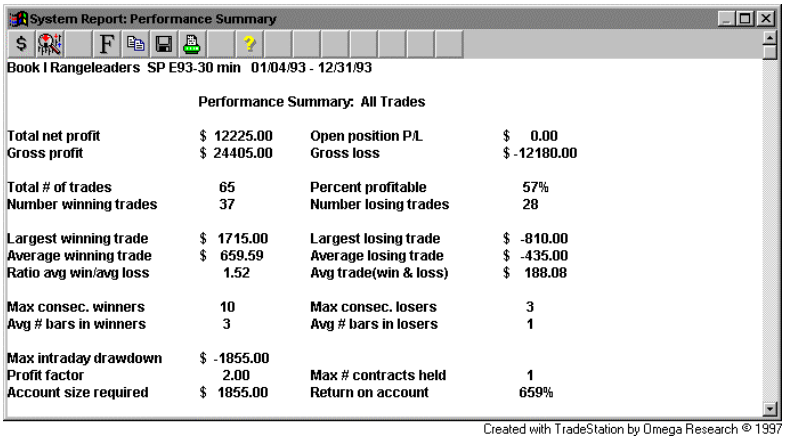
The second reason not to include margin as part of the investment is that margin requirements change frequently. This would force us to estimate an average margin over a period of years, which would distort the year to year returns. In the case of the S&P futures, for instance, this would be difficult given the wide swings in margin over the last 10 years.

Third, using ROMID facilitates the comparison of different strategies on different futures contracts. Comparing the Return on Maximum Intra-day Drawdown eliminates the differences in margin, concentrating on the return for actual funds at risk.

It is for these reasons that I do not recommend that you include margin in your calculation of the investment. Use MAXID as the investment and ROMID as the return on investment. This will facilitate the very important process of comparing returns on many different strategies.

Statistical Evaluation

PS 1 is a Performance Summary, which we have been looking at throughout this book. This is the financial information for the strategy and is the trader's equivalent of a corporation's Balance Sheet. This is the basic information that we use to analyze and compare trading strategies.



System Report: Performance Summary

Book I Rangeleaders SP E93-30 min 01/04/93 - 12/31/93

Performance Summary: All Trades

Total net profit	$ 12225.00	Open position P/L	$ 0.00
Gross profit	$ 24405.00	Gross loss	$ -12180.00
Total # of trades	65	Percent profitable	57%
Number winning trades	37	Number losing trades	28
Largest winning trade	$ 1715.00	Largest losing trade	$ -810.00
Average winning trade	$ 659.59	Average losing trade	$ -435.00
Ratio avg win/avg loss	1.52	Avg trade(win & loss)	$ 188.08
Max consec. winners	10	Max consec. losers	3
Avg # bars in winners	3	Avg # bars in losers	1
Max intraday drawdown	$ -1855.00		
Profit factor	2.00	Max # contracts held	1
Account size required	$ 1855.00	Return on account	659%

Created with TradeStation by Omega Research © 1997

PS 1

Sample Performance Summary

There are basically two parts to statistical analysis. The first are the statistics that reflect the viability of the strategy itself. The second are the numbers that are crucial when considering whether or not you can actually trade this strategy.

STRATEGY VIABILITY

The four numbers that are statistically important and reflect the viability of the strategy are: Total Number of Trades, the Average Profit per Trade, the Largest Winning Trade, and the Profit Factor. If these do not pass our initial test, then we look no further and try another strategy. However, if these four pass our minimum requirements, we then look at other values in the Performance Summary to see whether or not we could actually trade this strategy.

Total Number of Trades

The first number we look at is the number of trades. This should be a statistically significant number. The basic rule is the more trades the better. Ever since I started trading, 30 trades has been bantered about as the number of trades per signal required for a strategy to be statistically sound. I am not a statistician so I can't comment on the validity of this number. Nevertheless, I have always used it as sort of benchmark.

You have to draw the line somewhere and it might as well be 30 trades. The most important thing to remember the less trades in a test, the more skeptical you should be about the strategy's performance in the future. If I produced a strategy that had 200 trades and compared it to one that had 25 trades, I would certainly be more confident about the 200 trade strategy. If I produce a strategy that has 30 trades or less, the red flag goes up and I look at the strategy very carefully.

Average Profit per Trade

As another initial filter, I use the average trade (average profit per trade). It is this number that tells you how much room you have for trading mistakes. Even if you use a high number for slippage and commissions, you must have enough latitude in the average trade to cover several more ticks of slippage. You simply do not want to underestimate the possibility of greater slippage. I always want at least $200 per trade as an average, after slippage and commission. This ensures that even with a few more ticks of slippage there will be enough room for profits.

Largest Winning Trade

The Largest Winning Trade is a significant number as it relates to the Total Gross Profit and Net Profit. The issue is that if a large portion of the profits of a strategy come from one trade, we have a major problem with the strategy. I recommend that the Largest Winning Trade be no more than 50% of the gross profit or 25% of the Net Profit.

For example, over the years I have seen many profitable trend-following strategies on the S&P futures. Quite often, however, upon closer scrutiny I have found that most, if not all, of the profits have come from one short trade during the 1987 crash. If you take this one trade out, you would see that it distorts the profitability of the strategy and the profits would be dismal.

Profit Factor

The Profit Factor is calculated by dividing the Gross Profits by the Gross Losses. I view this amount as the risk/reward ratio. That is, how much reward am I going to get for risking $1.00?

My personal level is 2 to 1. I always want to at least have a 2:1 risk/reward ratio. If the Profit Factor is not greater than two, I will usually not trade the strategy. I work very hard to get a Profit Factor greater than 2.

I also use the Profit Factor to compare strategies. Most traders will look at the Net Profits or the ROMID to compare the effectiveness of a strategy. It is logical; the most profits or the most return on maximum intra-day drawdown. But for me, I like to look at the strategies with the greatest risk/reward ratio. The Profit Factor always clears up any ambiguity I might have when the Net Profits and the ROMID of several strategies are very close. In this sense, I use it as a tiebreaker.

PERSONAL EVALUATION

The second part of the statistical evaluation has to so with the characteristics of a strategy that have a bearing on your ability to trade it. If a strategy passes the financial test, and makes it through the first four statistical filters, then we are ready to look at the trading statistics to see if the strategy fits our personality and risk profile.

MAXID

The first number I usually look at for a trading strategy is the Maximum Intra-Day drawdown or MAXID. This number tells me the actual and maximum cash outlay that will occur at any one time to support the strategy. This is the major cost of doing business, in other words, the cost of maintaining the strategy.

MAXID calculates the amount of money that it takes to sustain a drawdown of funds between two new equity highs—losing trades plus slippage and commissions. It is the maximum amount of funds that you need to give up to invest in the market to get to the next new high in your account. This is what I call your pain threshold.

Why is this amount important?

First, you need to be financially able to withstand this kind of dip in your account. If this dollar amount is a stretch, then you should either find another strategy that has a lower MAXID or put the money in T-Bills.

Second, even if you can financially withstand the drawdown, the real issue is whether or not you could psychologically stand the pain. I know many traders who design strategies with a small drawdown because they are simply unable to take sustained losses. That's perfectly acceptable. Remember the whole psychological key to trading is to be able to take the losses. If you are uncomfortable with the level of MAXID, then you should find or design a strategy that has a level that is comfortable for you.

Percent Profitable Trades

As you look a the percent profitable, you have to ask yourself whether you can live with a strategy that has less than a 50% win rate or if your personal trading style requires more positive feedback.

Some traders can psychologically handle 40% or 35% winners. They have confidence in the historical data and know that even with this low rate of wins they will make money over time. Others will not be able to live with this. Being subject to such a large percentage of losers would produce much anxiety, decrease their confidence level, and most likely cause them to abandon the rules that make the strategy work. This is a prescription for strategy trading failure.

On the other hand, having a high percentage of winning trades does not necessarily make a better strategy. Many of the best performing and most profitable strategies I have seen have a Percentage Profitable Trades number in the 35% to 45% range.

So, the Percent Profitable Trades number has no real practical value other than psychological. You should think about this issue and the percent of profitable trades you could live with and would be able to trade effectively.

Maximum Consecutive Losers

This number's importance is again psychological. Just how many losers in a row do you think you could sit through before thoughts of abandoning the strategy enter your mind? 7? 8? 10? 3? Only you can assess this and decide. It is a personal matter, and it is of no practical value other than psychological.

And even if you think you could sit through 7 losers in a row, wait until you are faced with actually doing it. Even with great confidence in a strategy, and the historical data to back it up, this is a very difficult thing to do. When it happens to me, I have to keep reminding myself of two important philosophical points. First, the market will eventually have to facilitate trade and move. And second, that when it does move, my strategy is sound enough to catch the big move. These two precepts are what give me the confidence to go through a string of losing trades without losing my confidence.

So here you want to have a number that you honestly feel you could handle. You also should realize by now that it is possible to have a very long string of losing trades, even longer than the historical test, and still have a well designed strategy. Just be prepared when you actually start trading the strategy.

How to Know your Strategy has Busted

So we've been trading our great strategy real time for a while and it's been working very well, but lately we've been experiencing substantial drawdown and a significant number of losing trades. At this point, we need to make a reality check to ensure that our strategy is still working. We want to make an assessment as to the viability of the strategy that tested out great historically but is now losing money.

The first thing to assess is whether the strategy is catching the moves for which it was designed. If your strategy ever misses a move of the type for which you designed it, the strategy has busted.

A trend-following strategy is designed to lose money in sideways markets make it all back and more in the trend. If your trend-following strategy misses the big move, it clearly has busted. A number of losing trades in a row does not mean the strategy is not working. Missing the big move does.

Volatility breakout strategies bust when the volatility of the market changes substantially and the strategy misses the moves for which it was designed. For example, if your volatility strategy historically had 62% profitable trades and only two losing trades in a row, and you recently had a string of 6 losing trades out of the last 8 (25% profitable), with the last 4 being losses, clearly something has changed. The strategy is missing the moves for which it was designed and you should review the strategy.

Volatility strategies are designed for short-term quick profit trades. They have a high percentage of profitable trades. If there is no follow through on the volatility breakouts and the strategy is not performing up to its historical standards, you should reassess this strategy. If it is not capturing those short volatility pops, then something is wrong and the parameters need to be reviewed.

Excessive drawdown can also be a tip off that something is wrong. If for the last 20 years the MAXID has been no greater than $7,500 and we now have $9,000 of drawdown, the red flag should go up. You need to make sure that something important has not changed. If the drawdown exceed two times that which existed in your historical tests, I would stop trading the strategy until you figured out what is going on. Maybe the market is just in a never before seen sideways phase and you should stick it out. But maybe something else has changed. The key is that an overly large MAXID by historical standard is a good indication that the strategy should be reviewed.

Summary

It is an art to design an effective strategy. Strategy design is a creative process that capitalizes on the ability to synthesize new ideas and creatively put them together into a viable strategy.

In performing my financial evaluation, I want to make sure that the strategy itself compensates me for the increased risk over the 90-day T-Bill rate. If it does not, I would rather keep my money in T-Bills.

For personal and statistical evaluation, I use four key numbers:

1. Percent Profitable. What is my pain threshold?
2. Maximum Consecutive Losers. How many can I stand?
3. Maximum Intra-day Drawdown. What can I afford?
4. Profit Factor. I need a 2:1 risk/reward ratio.

I also make sure that the Total Number of Trades, Average Profit Per Trade, and Largest Winning Trade are within acceptable parameters.

The other analysis of the strategy is when we are actually trading it. Is it performing up to its historical potential? If it is not, we need to have a procedure to decide whether or not the strategy has busted. Obviously we should not be trading a strategy that is not catching the moves for which it was designed.

Strategy evaluation is not an art, it is a science. There is a clear procedure with a definite range of acceptable results. Once you have delineated your acceptable limits for the evaluation, the analysis should become routine. When your results move out of this acceptable range, the strategy becomes suspect. Early detection of a failed strategy is as important to long-term profitability as the design of the strategy itself.

Chapter 9:
Trading as a Business

"Trading as a Business" has always been a very good way to sum up my approach to trading. Every principle and idea in this book ultimately refers back to the notion that trading ultimately is a business and should be approached as such.

In the final analysis, business is simply the effective management of cash flow. A successful business generates more cash than it consumes. This is the goal of trading as well.

For most businesses, the key to success is attracting and keeping competent people. Personnel issues can and should consume a significant amount of time and effort, because a business really is only as good as its people. Trading for the most part eliminates this task, and also relieves us of the headaches and problems associated with managing employees.

Trading is a solitary endeavor. You will be freed from dealing with employees and the problems associated with managing employees, you will not be distracted by absenteeism, withholding taxes, EEOC rules and regulations, and disgruntled employee law suits. The only relationships you must manage are between you and the markets, and between you and yourself.

Bill Williams used to say that trading is the ultimate psychotherapy. He was right. Trading will expose some of your most prominent personality quirks as you attempt to trade your strategy. The more you learn about strategy trading, and the more you learn about yourself, the better a trader you will be.

Thinking of trading as a business has helped me enormously as a trader. It puts everything into perspective and helps me deal with my own psychological difficulties with trading execution. Once I stopped viewing trading as speculation, my trading improved. Once I realized that I was not going to get rich quick, that trading was not easy money, my trading improved. Once I realized that almost no businesses are successful overnight, my trading improved. Once I realized that I had to make an investment in the business, both in terms of my own education and in equipment and working capital, my trading improved.

Barriers to Entry

One concept that is commonly taught in business schools is that of 'barriers to entry.' This is a very simple concept that has important ramifications as you consider trading as a business.

The basic principle is that the higher the barriers to entry in a business, the higher the investment to establish market share but ultimately the higher the margins and profits. A good example is the beer business. Controlled by several large breweries, it would be financially very difficult to start up a new brewery and acquire significant market share. When Phillip Morris bought Miller, they spent over a billion dollars to acquire the business and do the advertising and promotion necessary to obtain market share. But Miller was successful, and when they achieved the share of market they wanted, the profits were outstanding.

The reverse is also true. If an industry has low barriers to entry, and there is a relatively small up front investment, there is much competition for profits and lower margins. This is the case for many service businesses, real estate brokers, securities brokers, cleaning services, etc. Restaurants are also a relatively low investment business. All you need is some decent space for tables and some cooking equipment and you are in business. However, the competition for customers is intense and thus the margins are low.

There is no good or bad when analyzing barriers to entry for a particular industry. If the investment is low, the stress comes from being smarter and superior than everyone else at making money. If the barriers are high, the stress comes from taking the large financial risk and the uncertainty of obtaining the target market share. Either way, the business is always difficult.

Trading is a low barrier business. You basically need a computer, a broker, and a modest amount of capital and you are in business. But because of the low barriers

to entry, the competition for profits is very high. There is no such thing as gaining market share.

Many people wrongly conclude that low barrier businesses are easy to start and trading is no exception. Many new traders think that trading will be easy and they will get rich quick. Experienced traders know that this will not happen. Trading is as difficult as any business I have ever been involved in.

The main point to remember is that trading is a business with low barriers to entry. This means that the competition for profits is very high and you will have to be smarter, more disciplined or more creative than the majority to make money.

The Product versus the Business

Producing a great product does not guarantee a successful business. History is littered with individuals who developed great products only to fail at running the business. Having a great product does not guarantee a successful business. Remember my restaurant example.

Most inexperienced individuals concentrate on the product. If the business is unsuccessful, they worry about and work on changing the product characteristics. In many cases, this will not fix the problem, because the problem is not the product.

In trading as well, most people concentrate on the product at the expense of the business, on the trading indicators and strategies rather than on managing the cash flow. They worry about the effectiveness of the indicators they are using and whether the entries and exits are the most effective. They argue with their brokers about fills and commissions, thinking if they get better fills and lower commission that the profits would improve. They miss the big point. A great product does not make a great business. A great indicator does not make a successful trader.

I can give you the greatest strategy in the world but if you can't trade it and don't know how to manage your cash flow, you will still be unsuccessful. I can't tell you how many traders have told me they are losing money trading profitable strategies!

So let's take a look at how to separate out the product from the business in trading. We know that the product is the indicator and trading method (or the strategy).

THE PRODUCT

I hope I have convinced you by now that trading a strategy is a better product than trading a "method." I wouldn't let any employees in a factory just be creative and make the product the way they thought it should be made on that particular day. If I did, there would be no consistency and no predictability in the product. Instead, we set up assembly lines and put in quality control procedures in place to ensure product quality and uniformity.

In the same manner, I cannot fathom how individuals think they can make money consistently when trading a "method" that allows them to trade when and how they "interpret" the Elliott Wave. That would be like changing your restaurant's menu each day, depending on your judgement of what people might want to eat. "Let's see, today we'll make Chinese food, because yesterday we made Italian and no one came in." The Elliot Waver would say, "Let's see, today I will buy because yesterday I sold. I thought I was in Wave 2 and lost money, so I must be in Wave 3." It's a prescription for financial failure.

Once we have decided on the strategy (our product), we then judge it in its own merits. I have discussed this at length in the previous chapters, but it bears repeating. A strategy must have acceptable statistics, be easy to understand, easy to implement, and fit your own trading personality. If your strategy can pass these criteria then you can move on to managing the business of trading.

The business side of trading is the task of managing the trades after the strategy has been developed. It is managing your cash flow and risk once the core strategy is up and running. This is similar to managing your cash flow and risk once your assembly line is up and running, a much different task than the designing and making of the product.

Contribution Analysis

Let's put together a simple profit and loss template for trading. It is based on a common business principal called Contribution Analysis. The basic formula is as follows:

> Revenue (Gross Trading Profit) – Variable Costs (Slippage and Commision) = Contribution
>
> Contribution – Fixed Costs (Office Expenses) = Net Profit

The revenue for our business is the gross trading profits, that is, the gross profits minus the gross losses from the strategy itself. This revenue fluctuates just as does the revenue in any business. In quiet, sideways markets, trend-following strategies will experience a decrease in revenue, or even losses. In most cases you will want to trade through this choppy period, minimizing your losses so that you will be there for the big move.

Our local natural gas company loses money every summer. But it makes back the losses and more in the winter when everyone needs gas for heating their houses. Your trend-following strategy will lose money in choppy markets, but if designed correctly, will make back the losses and more when the big move comes.

Every business goes through sales slumps and recessions. It goes with the territory. Trading is no exception. Eventually, the market, for a period of time, will not produce the market action for which your strategy was designed. It goes with the territory.

All markets have cyclical volatility. All markets trend and then go sideways. All strategies have losses. Accept this as a cost of doing business.

Losing trades are simply a cost of doing business, nothing more, nothing less. Every business makes scrap. Manufacturing businesses make scrap parts, restaurants serve poor dinners, and service companies have to refund for poor service. Every business produces some percentage of defective products. We traders have losing trades.

You will never eliminate losing trades, just as manufacturers never eliminate scrap parts. You just simply try to keep scrap at a minimum, and a reasonable part of your costs. If your scrap rate gets too high due to inattention, then you may begin to lose money, in both trading and manufacturing.

Trading is like any other business. Keep monitoring your scrap trades to see if they are getting excessive. If they are, you may have to alter your trading strategy, just as we may alter the assembly line, or increase our quality control monitoring.

Viewing losing trades as scrap trades in a viable business is a valuable way to get over the fear of losing money. Losing trades are a cost of doing business.

VARIABLE COSTS

Slippage and commissions are the important variable costs when designing a trading strategy and managing your business. How you treat these can make the difference in choosing what strategy to trade and what parameters to use on that strategy.

Commissions are the easiest to deal with, as this number is simply what you pay your broker, per contract or per share or per trade. It is a fixed number so it should be easy to add to the strategy.

Slippage is more difficult to figure. Slippage is the difference between the order that you gave your broker and the actual price that you got for your order. It is very common to get slippage on a trade, and you should include an amount for slippage in the calculations for your strategy.

For example, I have given my broker an order to buy a contract at 195.20 on a stop. As the price hits my stop point, the broker in the trading pit starts trying to buy a contract at the market. He may get the price I asked for or the market may be moving so fast that he keeps bidding up until he gets filled. In this case, he bids 190.25 and can't get it. So he bids 195.30 and still can't get a fill. So he bids 195.35 and finally gets filled. The difference between 195.35 (the fill) and 195.20 (the order) is three ticks and is called slippage.

The question is, how many ticks of slippage do we assume is going to occur over a period of time. I always assume at least one, and like to test for two and three. When I am close to trading a strategy I like to use three to make sure I am covered.

So for most of my tests I usually use a straight $100 for slippage and commissions. I assume one tick for commissions (you should be able to get your commission rate to one tick or less), and two or three ticks of slippage.

The effect of slippage and commissions can be substantial when looking at the effectiveness of several strategies, particularly when you are comparing them to choose which one to trade. Table 1 shows two sample strategies and their results.

Sample Strategies No Slippage and Commission		
Parameters	**Strategy A**	**Strategy B**
% Profitable	40%	60%
Ave. Profitable Trade	1250	1750
Ave. Losing Trade	500	500
Ave. Profit per Trade	200	862
# of Trades	125	29
Net Profit	25,000	25,000

Table 1

As you can see both strategies make the same amount of money. But if you look closely these are very different strategies, the most noticeable difference being the number of trades and the profit per trade.

If we add $100 for slippage and commissions we get a very different view of these two strategies.

Sample Strategies $100 Slippage and Commission		
Parameters	**Strategy A**	**Strategy B**
% Profitable	40%	60%
Ave. Profitable Trade	1100	1650
Ave. Losing Trade	600	600
Ave. Profit per Trade	100	762
# of Trades	125	29
Net Profit	12,500	22,098

Table 2

When comparing the two strategies in Table 2 you can see that using the $100 for slippage and commission changes the results dramatically. Where in Table 1 the strategies were equal in profitability, adding slippage and commission makes Strategy B the more profitable. Over this period, Strategy B paid $2,900 in slippage and commission ($100 times 29 trades), whereas Strategy A paid $12,500 in slippage and commissions ($100 times 125 trades). Which strategy would your broker want you to trade? Ponder on this. Make sure you have enough slippage

and commission included in your historical tests. It will make a great difference in how you view a strategy's performance especially when compared to other strategies.

Some slippage is unavoidable in trading, particularly during fast markets when there are no guarantees. But some slippage is also poor execution on the part of the floor broker. Slippage and commissions are interconnected because you must eventually weigh the cost of commissions with the service of your broker. Poor execution and an extra tick of slippage on every trade can eat up a low commission rate very quickly. Remember that there a good floor brokers and bad floor brokers. It is worth paying a little more commission for better fills.

The more trades you make, the more important slippage and commission becomes. The more trades you make, the higher the volume for your broker and the lower your commission rates should be. This is a very important cost of doing business and one you should focus on once your trading business is up and running.

CONTRIBUTION

The contribution is the amount of money you have left over after deducting your variable costs to support your fixed costs and overhead, and to provide your profit. Contribution is the important number that will judge the effectiveness of your product and business. Even though you may have a profitable strategy that provides substantial contribution, you still have to be able to cover your fixed costs.

FIXED COSTS

Fixed costs are the costs associated with your business that do not fluctuate with the number of trades. For example, your office rent, computer expenses, and data and software fees are all fixed. The funds you spend on books and magazines, seminars, heat, air conditioning, and electricity should all be included in fixed costs.

You should make enough from your trading to cover these fixed costs and provide a profit. If you can't cover your fixed costs with your trading contribution, you will not have a viable business. These are important costs, and you should pay attention to them just as you would to your variable costs.

Cash Flow Management

The success of a business ultimately rests with cash flow management. If your business is going to grow, you need to invest your cash wisely. It is interesting to watch businesses in different industries compete for market share and growth. Why is it that one company outperforms the other when they essentially sell the same product? Why is it that one trader makes more money than another does when they essentially trade the same markets? I believe that the answer lies in managing the cash flow wisely. Successful businesses have learned to manage additional investment well, control risk, and manage the growth of the business wisely.

The corollary in trading is what is called money management and risk control. This is basically pyramiding strategies, when to double up, add additional contracts and get aggressive. Also, when to be more conservative.

This is an area of trading on which there is not much emphasis. In trading education, so much importance is placed on indicators and strategies that there is very little time left for the ultimate weapon—sound cash management. This is what ultimately distinguishes the superior trader from all others. The power of cash management through pyramiding and risk control cannot be overstated.

The essential question when dealing with issues of money management is when to add contracts and how many. When do we grow the business? We know that our trading business can be successful if we only trade one contract. But how do we know when to add another? Can our trading business grow even faster if we manage our cash flow through pyramiding and risk control?

The answer is a resounding yes! Cash management can have a profound effect on the profitability and growth of your trading business. Let's take a look at how this works.

I am going to show you one way of approaching cash management for futures trading. There are many others. So please don't think of this technique as all encompassing or the only one available. My intent is to show you that this is a very important part of trading and hopefully inspire you to study this subject in depth.

The method I will show you assumes that a fixed percentage of Net Profit is risked on each trade, say 20%. If you use a money management stop that limits the risk per contract, it would be an easy task to calculate the number of contracts you should trade. For instance, if we accumulated $10,000 of Net Profit in our account, risked 20% or $2,000, and knew from our strategy that each contract was

limited to a $1,000 money management stop, we would buy 2 contracts. If the Accumulated Net Profit (ANP) balance grew to $20,000, we would be able to trade 4 contracts and still only risk 20% of the ANP. As the account grew, we would increase our contracts without increasing our percentage risk.

The reason I use ANP is that I want to increase contracts only when I am trading with other people's money or risking my profits. My basic risk control philosophy is that when my own money is at risk, I will only trade one contract.

Studies have shown that most business fail because they are undercapitalized. The owners have not put in enough money to get the business through the start up phase (what traders know as initial drawdown). There are countless business that have great products and are managed well, only to fail due to lack of capital. There are countless traders that have had to quit trading because they ran out of money before the profits started. They were unable to fund the initial drawdown.

For trading, to make sure that I have enough capital I start the account with enough money to get through three times the MAXID on the strategy's historical test. For instance, if on the historical test the MAXID is $11,000, I would put at least $33,000 in the account in addition to the margin required, and then, only trade one contract.

I may be a bit paranoid, but I have always assumed that "they" were out to get my money. "They" being the professional traders. And "they" would try to put me through as much pain and suffering as "they" could. Their goal is to take me through substantial enough drawdown so that I quit trading altogether, leaving my drawdown with them. If I quit after substantial drawdown, "they" have won.

To prevent them from getting my money, I capitalize the account so that I can comfortably trade through any drawdown they will give me. I refuse to quit because of lack of capital. And I vow to trade through whatever drawdown "they" will give me.

Once I have profits, I become one of "them." Then I leverage those profits by pressing the number of contracts I trade, all the while not increasing my own personal capital at risk. I would rather risk your money than my own.

To repeat, I will increase my exposure as my profits accrue, and I will only risk those profits with multiple contracts, not my original capital. In the above example, if the Accumulated Net Profit (ANP) dropped back down from $20,000 to zero, I would again be trading one contract as I would again risking my own money.

Now for the fun part. By changing the percentage of the ANP at risk, you can watch the exact same strategy provide markedly different profits depending on the number of contracts traded.

Let's take a look at a real example and see how the ANP Pyramid would have affected a very simple strategy. The strategy I have chosen is the old stand-by, a simple dual moving average strategy, which is a trend-following strategy. I used the Swiss Franc as the futures contract to be traded.

The first step is to find the optimal strategy parameters. The Strategy Parameter File SPF 1 shows the parameters I used to optimize the moving averages. For the short moving average, I tested from 2 to 18 periods, and for the long moving average I used 18 to 39 periods.

Strategy Parameter File Dual Moving Average Crossover			
Set-Up	Dual Moving Average Crossover		
Entry	None (Market on Close)		
Stops	None	Exits	None
MaxBarsBack	50	Slippage	$75
Margin	None Used	Commission	$25
Data Source	Swiss Franc Futures – Omega Research CD		
Data Duration	1/4/82 to 4/2/97		

SPF 1

TradeStation EasyLanguage
Strategy: Dual MA Crross

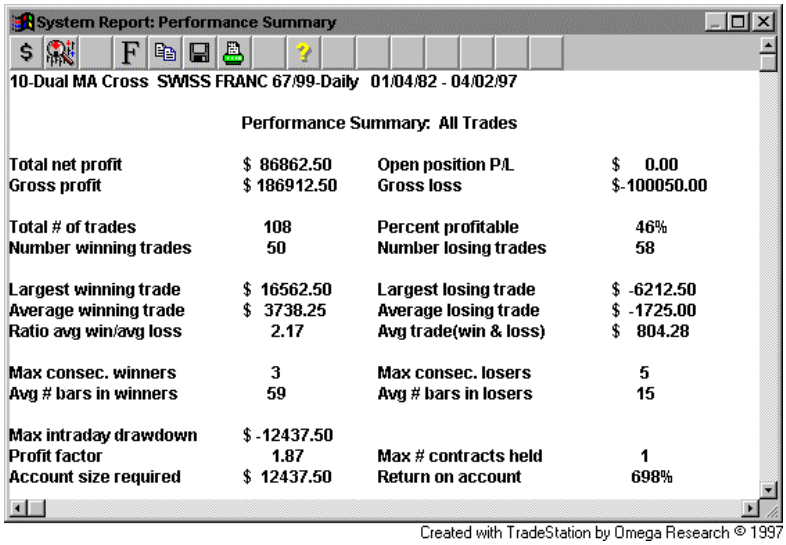
```
Input: Length1(12),Length2(39);

IncludeStrategy:"Exit on 4/2/97";

IF CurrentBar > 1 and
Average(Close,Length1) crosses
over Average(Close,Length2)
Then Buy on Close;

IF CurrentBar > 1 and
Average(Close,Length1) crosses
below Average(Close,Length2)
Then Sell on Close;
```

In this case, the optimal length for the short moving average is 12 and the optimal length for the long moving average is 39. The Performance Summary for the optimal averages is shown in PS 1.



PS 1

This performance summary is not bad for a first try. But remember that the Swis Franc is a very trendy market and it is very easy to find a trend strategy that is profitable.

The real question is how do we improve this very simple strategy using cash management and risk control?

Note that the results in PS 1 are not all that bad for a simple moving average strategy. But keep in mind that the Swiss Franc is a very trendy market and it would be very hard to find a trend-following strategy that did not work on the Franc. The Profit Per Trade, MAXID and ROMID are acceptable. Even the Percent Profitable trades are higher than I would expect for a down and dirty trend-following strategy. A negative is that the Profit Factor is under 2.0.

So now let's apply our ANP Pyramid to this strategy and see if we can improve the performance by improving our cash management. There is no rule that says that we have to trade only one contract.

As I previously discussed, this technique bases the number of contracts traded on a percentage of the accumulated Net Profit. But before we can do this, we need to quantify our risk per contract. To quantify our risk, we need a money management stop so that we know the maximum amount of money we are risking on each contract traded.

Step 2 is to find the optimal money management stop for this strategy. So I ran an optimization on the 12/39 averages using a money management stop range from $1,000 to $5,000 in $500 increments. The results are in Opt Table 1.

MMStop	NetPrft	ROMID	MAXID
$4,000	$90,450.00	810 %	$(11,162.50)
$4,500	$89,450.00	766 %	$(11,662.50)
$3,000	$82,400.00	728 %	$(11,312.50)
$2,500	$76,450.00	718 %	$(10,637.50)
$5,000	$87,162.50	716 %	$(12,162.50)
$3,500	$85,100.00	698 %	$(12,175.00)
$2,000	$76,512.50	679 %	$(11,262.50)
$1,000	$70,112.50	637 %	$(11,000.00)
$1,500	$67,362.50	473 %	$(14,237.50)

Opt Table 1

The fact that every one of the money management stop levels makes money adds a tremendous amount of comfort when looking at this strategy.

The optimal money management stop based on both Net Profit and ROMID is the $4,000 stop. So let's use this stop to quantify our risk for each trade. We now know that for every contract traded, we will only risk $4,000. The Strategy Parameter File for this test is shown in SPF 2.

Strategy Parameter File Dual Moving Average Crossover			
Set-Up	12 / 39 Period Moving Average Crossover		
Entry	None (Market on Close)		
Stops	**$4,000 MM**	Exits	None
MaxBarsBack	50	Slippage	$75
Margin	None Used	Commission	$25
Data Source	Swiss Franc Futures – Omega Research CD		
Data Duration	1/4/82 to 4/2/97		

SPF 2

The code for this is the same as in SPF 1 using the 12/39 moving averages.

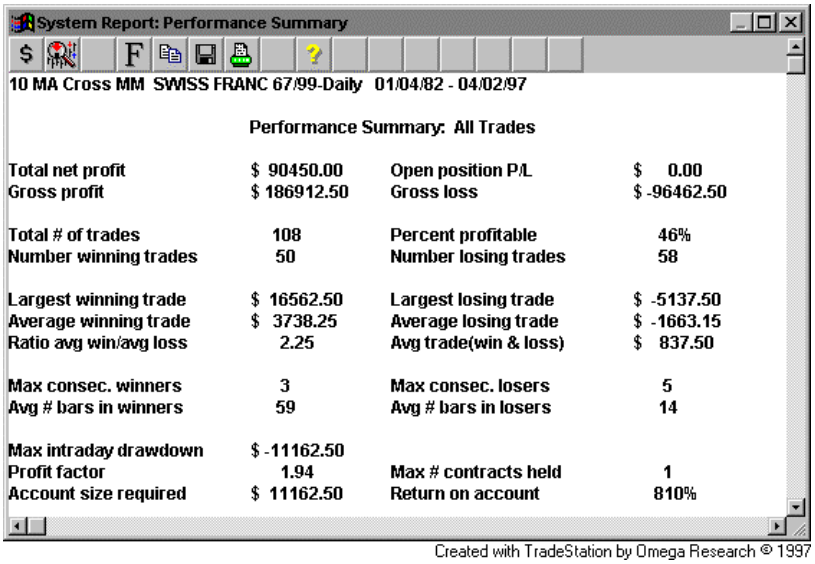
The additional step is optimizing the money management stop.

I usually expect that the performance would be worse with the money management stop but it was not. It actually improved slightly. The Performance Summary for the strategy using a $4,000 money management stop is shown in PS 2.

At this point, we have accomplished two things. In Step 1, we optimized for the two moving average lengths and ended up with the 12 and 39. Even though we

had the optimal averages, we had no way of knowing what our risk per trade was. Without a stop, the risk is open-ended. What we do know is that in the test without stops (PS 1), our largest losing trade was $6,200. Without a money management stop it could even be higher.

Then in Step 2 we optimized to obtain the $4,000 money management stop (the results in PS 2), this fixed our loss per contract to a specific amount so we can calculate how many contracts to trade based on this risk. The reason the largest loss is greater than $4,000 in PS 2 is that it occurred on a gap opening beyond the $4,000 stop point.



PS 2

The $4,000 money management stop actually improved the performance of the moving average crossover strategy. It improved the strategy by fixing the maximum amount we would allow a loss to be on any trade.

This is the core concept behind risk control. We in effect are limiting our risk to $4,000 per contract traded.

The Profit Factor is getting closer to 2.0.

Now we are ready for Step 3, which is to determine what percentage of our accumulated Net Profit we will risk on each trade. For instance, if I choose to risk 100% of my accumulated net profit, I will trade one contract with a $4,000 money management stop until I have made $8,000. At this point, I will trade 2 contracts, each contract risks $4,000 for a total of $8,000 at risk. However, none of this will be my money! I have now made enough ($8,000) to trade two contracts risking none of my money. If my net profit improves to $12,000, I will trade 3 contracts (3 times $4,000). If the Net Profit drops back down to below $8,000, I will again only trade one contract.

The issue is how much of the Net Profit to risk on any one trade. In the example above, I risked 100%. But I may only want to risk 50% of the Net Profit, or 25%.

The only reasonable way to decide how much of the Net Profit to risk is to use the Optimization feature in TradeStation to test for the percentage risk and analyze the results.

To determine what percentage of the account we should risk on any one trade, we test the various percentages of the account that could be risked on any trade, and then increase or decrease the number of contracts accordingly. The results of these tests are in Opt Table 2.

% ANP at Risk	Net Profit	Average Trade	Profit Factor	ROMID	MAXID
10%	$97,875	$906	1.90	603%	$(16,225)
20%	$312,763	$2,896	2.00	390%	$(80,163)
30%	**$758,275**	**$7,021**	**2.07**	**329%**	**$(230,275)**
40%	$2,496,925	$23,120	2.01	264%	$(943,750)
50%	$3,427,413	$31,735	1.87	209%	$(1,640,850)
60%	$2,256,463	$20,893	1.64	148%	$(1,517,950)
70%	$1,224,638	$11,339	1.32	80%	$(1,515,950)
80%	$23,125	$214	1.01	1%	$(1,703,813)
90%	-$291,125	-$2,696	0.95	-6%	$(4,516,563)
100%	-$486,125	-$4,501	0.89	-14%	$(3,421,388)

Opt Table 2

Note that the profitability increases up to 50% of the Net Profit at risk and then declines. So there is an optimum amount of risk that would be appropriate. If we did no further tests, 50% would give us the most profits.

Also note however that the ROMID declines with the profits as the drawdown increased. So the large profits come at a great price.

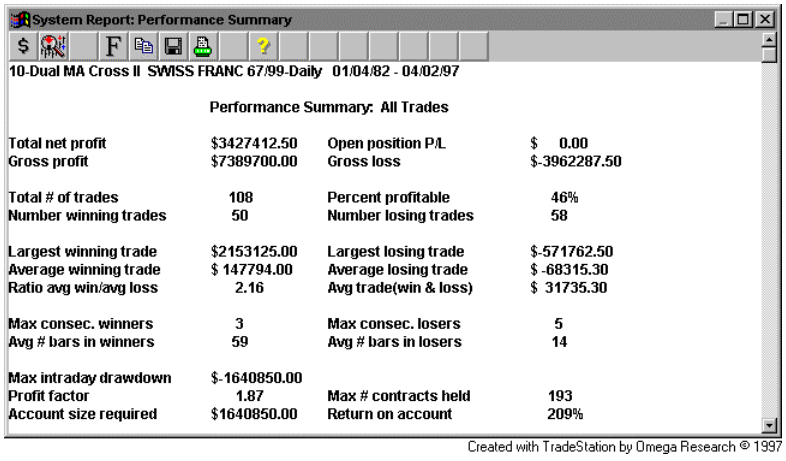
As you can see, this increased the net profit of this strategy substantially, depending on the amount of Net Profit that we risked. From Opt Table 2, we can see that risking 50% of the Net Profit would give us the optimal profit. If we wanted to, we could find the optimum by running another test in 1% increments, but for our purposes, this test gives us all of the information we need.

The point for you to consider here is that we devised a simple moving average strategy that made a little more than $90,000 trading one contract. With the ANP Pyramid strategy, we can get the profits over $3,000,000. This should demonstrate to you that managing the cash and risk by increasing/decreasing the number of contracts traded is as important as the strategy itself.

Also note from Opt Table 2 that profits decrease as the amount of the Net Profit risked increases beyond 50%. This is also very significant. Risking too much of our Net Profit can decrease profitability. Somewhere between trading 1 contract and risking 100% of our Net Profit on each trade then, is an optimal percentage of Net Profit to risk. This amount is then translated into a number of contracts

that should be traded. Once we find this number, we see our profits increase dramatically.

This increase in profits however is not without a price, and the price is increased drawdown. This is the point where personal preference and risk aversion comes in. PS 3 shows the Performance Summary of the strategy risking 50% of the Net Profit and producing over $3 million in profits. Compare this summary with PS 2. It is the same strategy, just different cash management.



PS 3

TradeStation EasyLanguage Strategy: Dual MA Cross

```
Input: Length1(12),Length2(39),
    Percent(.02);
Vars: AccountRisk(0),Num(1);
IncludeStrategy:"Exit on 4/2/97";
AccountRisk = NetProfit * Percent;
Num = AccountRisk/4000;
If Num < 1 then Num = 1;
IF CurrentBar > 1 and
Average(Close,Length1) crosses
over Average(Close,Length2) then
Buy Num contracts on Close;
IF CurrentBar > 1 and
Average(Close,Length1) crosses
below Average(Close,Length2) then
Sell Num contracts on Close;
```

There are some real concerns about this Performance Summary. First you should note that the largest trade is greater than 50% of the Net Profit. This is simply too high a percentage for the largest trade. Second, the ROMID decreased substantially, demonstrating that it took more investment (drawdown) to get a dollar of profits. Third, the Profit Factor is under 2.0. The financial risk/reward trade-off was changed substantially by using the ANP Pyramid. Would we trade it as is? Probably not. The risk/reward ratio changed dramatically as represented by the ROMID, which declined from 810% trading one contract to 209% with the ANP Pyramid.

What we know now is that using the ANP Pyramid can increase our profits dramatically. But it also increases the risk to a point where it probably is not feasible to trade this strategy. So what do we do now? The answer to this question is to work on the risk side of the equation.

At this point, I need to talk about the philosophy of risk control as it relates to trading strategies. This is a very important point, so I hope you will bear with me as I explain some of the subtleties.

The basics are that there are two sides to every trading strategy, the risk and the reward. Most strategy developers work on the reward side. They spend hours developing entry signals and testing different parameters, all the while using only one contract. Thus they are limited in the scope of their investigations because they only use one contract.

When you limit your tests to only one contract, there is not much you can do with the risk side of the equation. Strategy refinement simply becomes a matter of exit strategy and money management stop placement.

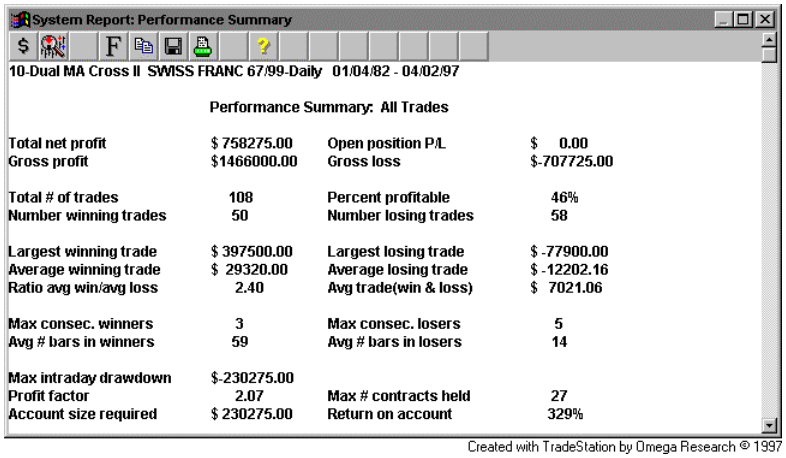
Over the years, I have learned that when using one contract, tight stops or exits are unlikely to improve the strategy. My tests have usually shown that the one-contract strategies with the largest returns usually have no stops or very wide money management stops. The reason for this, I believe, is that when you trade only one contract, the big returns occur when each trade is given a lot of room. A large profit from one contract can be readily eaten up by many small losses. Many times the small losses would have been large winners had they been given more room.

The point is that when trading one contract, there are not a lot of things you can do to work on the risk side of strategy. This is not true when you use the ANP Pyramid or other money management techniques.

As the number of contracts traded increases, my experience has been that it becomes more appropriate to spend a lot of time working on stop placement. A string of winning trades will result in increasing the number of contracts traded. If the run-up in contracts is designed correctly, closer stops and different types of stops (stops that are not appropriate to use when trading only one contract) will protect these profits. Let me show you what I mean.

The problem we have now is not with the profits (the reward side), but the risk (the drawdown). The drawdown has increased too much as we increased the additional profits. So let's work on the drawdown and see if we can't reduce it as a percentage of the profits (increase the ROMID).

If we are to focus on risk/reward, we should concentrate on the amount of money we make when compared to the amount of money we have lost. This ratio is the Profit Factor on the Performance Summary. If you look at Opt Table 2, we find the best Profit Factor is 2.07 (gross profit divided by gross loss) when we have risked 30% of our Net Profit. It is interesting to note that the best Profit Factor does not necessarily coincide with the most profits. So let's work with 30% of our Net Profit as our risk and see if using some tighter stops won't decrease our risk. The entire Performance Summary for the 30% strategy is shown in PS 4.



System Report: Performance Summary

10-Dual MA Cross II SWISS FRANC 67/99-Daily 01/04/82 - 04/02/97

Performance Summary: All Trades

Total net profit	$ 758275.00	Open position P/L	$ 0.00
Gross profit	$1466000.00	Gross loss	$-707725.00
Total # of trades	108	Percent profitable	46%
Number winning trades	50	Number losing trades	58
Largest winning trade	$ 397500.00	Largest losing trade	$ -77900.00
Average winning trade	$ 29320.00	Average losing trade	$ -12202.16
Ratio avg win/avg loss	2.40	Avg trade(win & loss)	$ 7021.06
Max consec. winners	3	Max consec. losers	5
Avg # bars in winners	59	Avg # bars in losers	14
Max intraday drawdown	$-230275.00		
Profit factor	2.07	Max # contracts held	27
Account size required	$ 230275.00	Return on account	329%

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PS 4

This is the performance summary that we will start with as we begin to apply some creative stops to limit our risk with multiple contracts.

The Profit Factor is greater than 2.0. We hope to lower the drawdown while maintaining the profits, thus getting our ROMID from 329% up to where we started with one contract (810%). The one contract summary is PS 2.

The first stop that I would use to limit the risk is what is known in TradeStation as a breakeven stop. This stop places a stop loss at breakeven if the profit of the trade hits a certain amount. For instance, we might place a breakeven stop if the current profit per contract reaches $2,000. Then, at least we know that we will not lose money on this trade.

BkEvn $	NetProfit	AvgTrd	Profit Factor	ROMID	MAXID
1000	**$921,763**	**$8,535**	**3.29**	**496%**	**-$185,825**
1500	$635,600	$5,885	2.28	263%	-$240,963
2000	$887,138	$8,214	2.25	311%	-$284,963
2500	$1,007,488	$9,329	2.41	502%	-$200,588
3000	$924,963	$8,564	2.26	422%	-$218,800
3500	$925,563	$8,570	2.26	428%	-$215,838
4000	$849,400	$7,865	2.24	430%	-$197,200
4500	$849,400	$7,865	2.24	430%	-$197,200
5000	$851,513	$7,884	2.23	432%	-$196,825

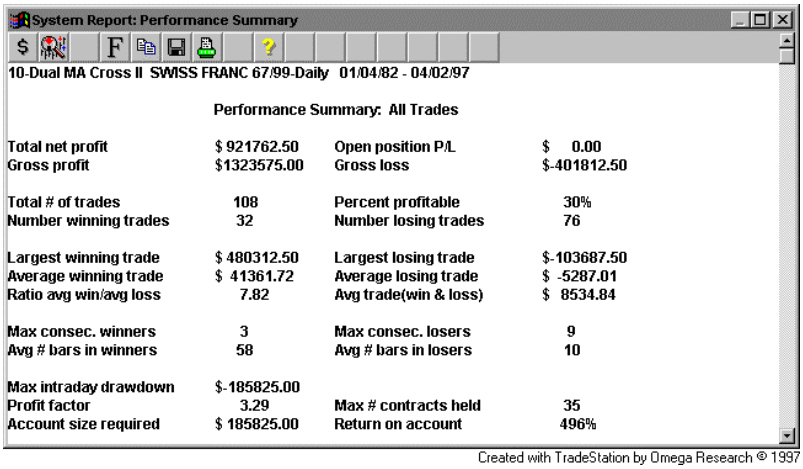
Opt Table 3

If we ranked these by profits or ROMID, $2500 would be the best choice. But we are working with risk/reward now and we must focus on the Profit Factor which is the Gross Profit divided by the Gross Loss.

Note that the strategy with the best Profit Factor is not necessarily the one with the most profits.

Opt Table 3 shows the result of the test of the different breakeven levels. The most profitable level is a $2,500 level, that is, if the trade reaches a profit of $2,500 per contract, we will move the original $4,000 money management stop up to our entry price for a breakeven trade. But we are not looking for profits here; we are looking for the best risk/reward ratio. The best risk/reward ratio occurs with a $1,000 breakeven target. The profit factor for this amount is 3.29, close to 50% higher than all of the other tests.

The most notable thing about PS 5 is that the percentage profitable trades has dropped to 30%. This is because a breakeven trade is considered a losing trade. In fact, it is a losing trade because we still have to pay slippage and commission on the trade even though we got out at breakeven. The ROMID has increased to 496% from 329%. And the drawdown has decreased from $230,000 to $185,000. All in all a good start.



System Report: Performance Summary

10-Dual MA Cross II SWISS FRANC 67/99-Daily 01/04/82 - 04/02/97

Performance Summary: All Trades

Total net profit	$ 921762.50	Open position P/L	$ 0.00
Gross profit	$1323575.00	Gross loss	$-401812.50
Total # of trades	108	Percent profitable	30%
Number winning trades	32	Number losing trades	76
Largest winning trade	$ 480312.50	Largest losing trade	$-103687.50
Average winning trade	$ 41361.72	Average losing trade	$ -5287.01
Ratio avg win/avg loss	7.82	Avg trade(win & loss)	$ 8534.84
Max consec. winners	3	Max consec. losers	9
Avg # bars in winners	58	Avg # bars in losers	10
Max intraday drawdown	$-185825.00		
Profit factor	3.29	Max # contracts held	35
Account size required	$ 185825.00	Return on account	496%

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PS 5

This is the same 12/39 Moving average crossover strategy with a $4,000 money management stop.

The breakeven stop for all contracts is placed when each contract has a $1,000 profit.

But this is not enough. I still think that this would be very difficult to trade this strategy. The drawdown is still high compared to the one contract strategy. We need to lower our risk even more.

The way I like to keep chipping away at the risk is to start moving my stop up to protect profits. Right now we have an initial $4,000 money management stop per contract, and when each contract makes a $1,000 profit, we move the stops up to breakeven. But we have done nothing to protect our earned profits. If we have a profit of $10,000 per contract, we still have our stop at breakeven. I always try to see if moving up the stop won't decrease my risk even more.

$TStop	Net Profit	AvgTrd	Profit Factor	ROMID	MAXID
1000	$18,563	$172	1.45	294%	-$6,313

Opt Table 4

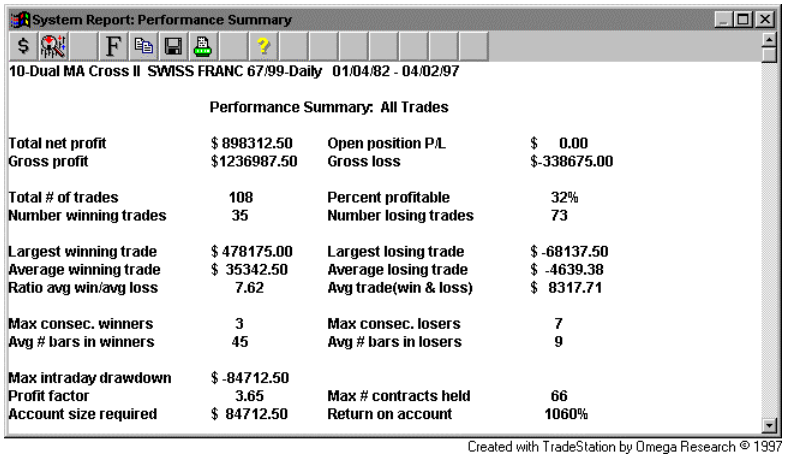
In this table, the best risk/reward parameters also have the most profit and the highest ROMID. Everything fell into place. We know we have found the right combination.

1500	$45,663	$423	1.48	316%	-$14,425
2000	$82,500	$764	1.54	217%	-$37,888
2500	$220,675	$2,043	1.71	203%	-$108,225
3000	$272,675	$2,525	2.36	698%	-$39,038
3500	**$898,313**	**$8,318**	**3.65**	**1060%**	**-$84,713**
4000	$626,263	$5,799	3.43	1000%	-$62,588
4500	$747,375	$6,920	3.28	912%	-$81,888
5000	$658,188	$6,094	3.05	729%	-$90,275

In Opt Table 4, we see that a $3,500 trailing stop produces a substantial decrease in drawdown. Before we tested this stop, the drawdown was around $200,000 (Opt Table 3). With the trailing stop, we have reduced the drawdown substantially to at or below $100,000. And if you look at Opt Table 4, you see that at three stop levels, $3,500, $4,000, and $4,500, the ROMID is greater than the ROMID we started with for one contract (810%). You could justifiably pick any of these three trailing stop levels for actual trading.

This is very significant. We have increased the ROMID from 810% to 1060%, and we also have increased the profits from $90,000 to $900,000.

What we have done is modify the original one contract strategy with the ANP Pyramid cash management strategy. Along the way we added an initial $4,000 money management stop, a breakeven stop when the profit per contract hits $1,000, and a $3,500 trailing stop. The final Performance Summary is in PS 6.


System Report: Performance Summary

10-Dual MA Cross II SWISS FRANC 67/99-Daily 01/04/82 - 04/02/97

Performance Summary: All Trades

Total net profit	$ 898312.50	Open position P/L	$ 0.00
Gross profit	$1236987.50	Gross loss	$-338675.00
Total # of trades	108	Percent profitable	32%
Number winning trades	35	Number losing trades	73
Largest winning trade	$ 478175.00	Largest losing trade	$ -68137.50
Average winning trade	$ 35342.50	Average losing trade	$ -4639.38
Ratio avg win/avg loss	7.62	Avg trade(win & loss)	$ 8317.71
Max consec. winners	3	Max consec. losers	7
Avg # bars in winners	45	Avg # bars in losers	9
Max intraday drawdown	$ -84712.50		
Profit factor	3.65	Max # contracts held	66
Account size required	$ 84712.50	Return on account	1060%

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PS 6

Look at what you can do with some cash management and a few additional stops!

If you compare PS 6 to PS 2, you will see that every category of the Performance Summary has improved. The profit increased ten fold, the ROMID is now over 1000%, the profit factor is up substantially, and the ratio of average win to average loss is much better. The only thing that deteriorated is the percent profitable trades, but we know that this is just an increase in breakeven trades because of our new breakeven stop at $1,000 profit. And note that our cash management had us trading 66 contracts.

The other item that you should note is that half of the profits came from one trade. This was a big trend trade, the second to last in the test, which had major profits with 31 contracts. It was the same trade that was the largest in the one contract test, but it was substantially larger because of the increase in contracts. I do not think this is a major concern because that is what we use cash management for, to increase our profits. The last profitable trade should be the largest as it will most likely have the most contracts. Table 3 compares the results of using one contract versus using the ANP Pyramid and additional stops.

Parameter	One Contract	ANP Pyramid & Stops
Net Profit	$ 90,450	$ 898,312
Average Trade	$ 838	$ 8,318
Profit Factor	1.94	3.65
ROMID	810 %	1060 %
MAXID	$ 11,163	$ 84,713

Table 3

Using the ANP Pyramid and additional stops has multiplied our profits by a factor of ten. Every other statistic improved as well.

But what about just adding the stops to the original strategy without the ANP Pyramid? Does adding the breakeven stop and the trailing stop improve the original strategy without cash management? Let's take a look at this in Table 4 below.

Parameter	One Contract	One Contract & Stops
Net Profit	$ 90,450	$ 87,325
Average Trade	$ 838	$ 809
Profit Factor	1.94	2.37
ROMID	810 %	1046 %
MAXID	$ 11,163	$ 8,350

Table 4

The addition of all the stops doesn't improve the strategy all that much.

You will see in Table 4 that the addition of all these stops really does not improve the strategy all that much considering that there is 15 years of data. To decrease the drawdown by $3,000 over 15 years is hardly worth mentioning. As I said previously in this chapter, the use of risk reducing stops usually does not substantially help strategies that only trade one contract. But when you start using cash management techniques to increase the number of contracts you are trading, extensive risk control through the use of stop losses helps the strategy dramatically. The final strategy is shown in SPF 3.

Strategy Parameter File Dual Moving Average Crossover			
Set-Up	12 / 39 Period Moving Average Crossover		
Entry	None (Market on Close)		
Stops	**$4,000 MM $1,000 Bkeven $3500 Trailing**	Exits	None
MaxBarsBack	50	Slippage	$75
Margin	None Used	Commission	$25
Data Source	Swiss Franc Futures – Omega Research CD		
Data Duration	1/4/82 to 4/2/97		

SPF 3

The code for this is the same as in SPF 1 and 2 using the 12/39 moving averages.

The ANP Pyramid cash management strategy was used to add contracts

Three stops were used: An initial money management stop, a breakeven stop, and a trailing stop.

Note: *For the comparisons I made in this chapter, I also used Portfolio Maximizer, an add-on product to TradeStation available from Omega Research, Inc.*

Summary

The steps you need to consider for managing your trading cash flow are as follows.

- Optimize the parameters of the strategy if appropriate.
- Limit your per trade risk by optimizing a Money Management Stop.
- Test a range of percentage Net Profit risk for the ANP Pyramid. I usually test from 10% to 100% of Net Profit.
- Determine the percentage of the Net Profit you will risk. The money management stop amount divided into the Net Profit dollars risked will determine the number of contracts traded.

- Test risk control stops against the strategy with the ANP Pyramid. At a minimum, I always test a breakeven stop and a trailing stop, but you should be as creative and exhaustive as you can.

Thinking of trading as a business is a very important step in the education and training of a successful trader. There are two important aspects of trading as a business. The first is to begin to think of your trading as a business comparable to any other business, whether it be a restaurant, a software company, a personal service company or a manufacturing company. You happen to be managing a trading company.

The second part of trading as a business is to move out of the realm of worrying about the product, and start to worry about the cash flow of the business and how you are going to re-invest the profits. This is what I call cash management, and what is called money management in the futures industry.

Cash management is the most important aspect of trading as a business. The more comfortable you become with the concept, the more important it will be to you. The final step for the accomplished strategy trader is to develop strategies based on the preferred method of cash management and risk control. As you get more sophisticated, you will begin to develop strategies that work well with your cash management preferences, rather than apply your cash management preferences to your favorite strategies. If you don't fully understand this last sentence, it's OK, you will.

As you saw in this chapter, we were able to take a mediocre moving average crossover strategy and increase the profits over a 15-year period from $90,000 to almost $900,000, just by managing the cash flow and the risk. We did not accomplish this by fooling around with the indicator.

Unfortunately, most traders never get to this point. What is needed to manage cash flow is a predictable cash flow. The only way you can begin to predict future cash flows is to trade strategies. You can not predict your future cash flow using the Elliott Wave or Gann Lines. You predict your future cash flow by projecting your historical tests forward. Once you can predict your future cash flow, you can then begin to manage that cash flow and reinvest and leverage the expected cash flow. This is a concept foreign to most traders.

There are many other approaches to cash management than just the ANP Pyramid that I have shown here.[5] At the appropriate moment, you should put as much energy into studying all you can about cash management or money management as you have in studying indicators. As you can see, you can make a

poor strategy better simply by using cash management. When you understand the power of cash management, you will begin to spend more time managing the cash flow than exploring the latest and greatest indicators.

Remember, you don't need a great strategy to make money if you use appropriate cash management principles. But you do need an outstanding strategy if you are only going to trade one contract.

Learn all you can about trading as a business—about managing your cash flow and risk. It will turn what might be termed a chancy speculation into a viable business.