PREFACE

We live in an age that is dominated by the "I know what I want and I want it now" attitude. It is a time of fast food and quick fixes. A time of self before everything and Me! Me! Me! A rat race of the lowest kind. Keeping up has never seemed more important-a mentality of getting rich quick at any cost.

This attitude is also why many people are getting involved with the commodity and futures industry. Trading can be a powerful endeavor. On the other hand, it can also be financially crippling. Trading is a game of risk versus reward. It is also a game that is not forgiving of players who come in without learning the rules. For those with the "get rich quick" or "gotta have it now" mentality, failure is all but certain.

The failure rate of those who attempt to trade in the leveraged markets arena is somewhere around 90 percent. As far as I can tell, this means that 90 percent of those who begin trading stop showing a net loss. I have also been told that at any given time 90 percent of the open accounts show losses while only 10 percent of the accounts show profits. These statistics illustrate that getting rich quick in these markets is highly improbable. To make serious money in this environment, traders must manage their money. Unless sheer luck intervenes, no one will make a fortune in leveraged markets without proper money management strategy. This is the basis of this book.

RYAN JONES

Colorado Springs, Colorado
March 1999

ACKNOWLEDGMENTS

Many people have helped me gain the knowledge to write about money management on leveraged instruments. The information in this book is based primarily on experience-from experience, then came research. From my research I developed the methods described here. Therefore, I want to acknowledge first those who made the experiences possible.

When I was 16 years old, I entered a national stock-trading contest with my high school economics class and became very interested in the markets. My first mentor was Mike Benzin, a member of the same church I attended. He was an analyst with Smith Barney and offered to help me. He took the time to begin to teach a high school kid about the markets and how they worked. He opened his office doors to me anytime (sometimes daily) and put up with my constant inquiries and inconvenient presence. Without Mike, I would have never gotten started in the markets.

I was married, had two children, and was putting myself through college when Fred Stoops hired me at the law firm of Richardson, Stoops & Keating in Tulsa, Oklahoma. My year and a half at the firm was another crucial time period during my training. Fred did more than just provide a paycheck, much more. A simple acknowledgment cannot describe Fred's profound influence on my trading career or my life in general. I am greatly in debt to him for what he has given me. In that same law firm, Chuck Richardson became a good friend and showed a great deal of trust in my trading abilities. Chuck and I were in some trades together. Through one series of those trades came the experience that drove me to research

money management in trading. Chuck certainly deserves some credit for this book.

I left the law firm to become a broker in south Florida, but quit after only three months when I realized that being a broker was not for me. My plan all along had been to learn the industry for two years and launch my own business. Needless to say, I wasn't ready to start my own business after three months. So, I decided to try trading for a living. After about six months, I found out I wasn't ready for that either.

However, as I put my business plan together, Willard Keeran showed a great deal of faith in my abilities and completely funded the start-up of Rumery & Lehman, Inc. Not only did he and his family completely fund the business, they did so without any strings attached. I had the freedom to take the business in whatever direction I saw fit without even a hint or question from Willard. If anyone has shown complete trust and faith that this venture would become a successful one, it is Willard-the single most influential person (except for my wife) in making this book, my trading, and my business a reality. Thank you, Willard, for your trust, confidence, and more importantly, your prayers.

Among the many others who belong in this acknowledgment are our four daughters, Autumn Faith, Summer Hope, Winter Love, and Spring Grace and our son, Christian Everett, whose free spirits have been an encouragement to me. My former partner, Darren Peeples, who put up with the worst of me, has been a true friend. Monte Veal is a friend who would gladly give up his life for me and I for him. He is a steadfast friend and brother. My father-in-law, Thomas Gamwell, helped me put together some of the formulas contained in this book. Thanks to my parents, George and Pat Jones, who raised me and showed me how to earn my living with hard work. And, last but certainly not least, Larry Williams has given his friendship and his support of many of the methods contained in this book. In addition, I have benefited from his massive research.

This list could go on for a long time. I want to thank everyone who has contributed to this undertaking. I could not have done it alone.

R. J.

CONTENTS

THE TRADING GAME

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WHY? WHAT? WHERE? WHEN? WHO? HOW?

Before deciding to read a book about playing a numbers game (otherwise known as money management), most people have to be convinced that the information is important enough to be worth their time and effort. After they accept that the reasons are compelling, they must understand what money management is and how this differs from what most traders believe money management is. The next logical question is where to apply money management principles. Are certain markets or methods unsuitable for money management? Do some work better than others do? The trader who knows why it is important, what it is, and where it needs to be applied, next asks, when do I start applying it? Now? Later? After there is a certain amount of profits? After the account enters into a losing time period?

Who should apply money management principles? Isn't money management for large accounts? Aren't money managers the only ones who can really use money management principles? Is it just for a certain type of trader? Are stock traders included? Finally, how to apply money management rounds off the basic questions traders most frequently ask about this subject. This chapter answers many of these questions generally; the rest of the book provides the specifics. Fasten your seatbelts, you are about to enter the money management zone!

WHY?

Why in the world do I want to persuade sane, intelligent readers to willingly spend a few hours learning about a subject that is believed

to rival accounting in boredom? Why? Because money management is misunderstood-it is far from boring; it truly is exciting. No other knowledge in the whole realm of trading or investing can ignite an account faster than money management. Look at the following numbers and judge for yourself.

A common goal among many traders is to achieve $1 million in trading profits in their lifetime. It is a dream that most traders do not expect to actualize in less than 20 years (unless they are beginners, who think they can reach $1 million in trading profits in a little over an hour). However, the following numbers are what you need to achieve $1 million in profits with the help of the money management techniques in this book. These numbers are based on a conservative money management approach (as opposed to aggressive).

> To reach $1 million in profits using a conservative **Fixed-Ratio** money management approach, you need $100,000 in profits based on trading a single unit, contract, or option.

That's right, you don't need $1 million to achieve $1 million. You only need to build profits that total $100,000 based on trading a set number of stocks or a single unit, contract, or option. What this means is that a person who trades a single contract, option, or set number of shares of stock and makes $100,000 at the end of five years, instead could make $1 million by implementing proper money management or increasing the risk on each trade. We can break this down into a five-year achievement goal:

1. $100,000 in profits during the next five years.
2. $20,000 profits per year for the next five years.
3. $1,667 profits per month for the next 60 months.
4. $384 profits per week for the next 260 weeks
5. $75 per day on average for the next 1,320 trading days.

This amounts to 3 ticks per day in the Standard & Poor's (S&P) Index, or less than 3 ticks per day in bonds, or $¾ in stock trading 100 lots per day, or 6 ticks per day in a currency market, or 2 ticks per day in the coffee market. You get the picture.

For those who trade a basket of currency markets such as Swiss franc, Deutsche mark, Japanese yen, British pound (SF, DM, JY, BP):

1. $20,000 per year in profits for five years.
2. $5,000 per market per year for the next five years.
3. $416 per market per month for the next 60 months,
4. $96 per market per week for the next 260 weeks.

This comes to a little over 1.5 ticks per day per market. For those who are well diversified across 10 markets:

1. $20,000 per year in profits for the next five years.
2. $1,667 per month in profits for the next 60 months.
3. $167 per market per month trading 10 markets.
4. Less than $40 per week per market.

Because we are dealing with math, the power of this type of money management is not limited to just futures and options. To accomplish the same goal trading 10 stocks of 100 lots each:

1. $100,000 in profits over a five-year period.
2. $20,000 each year for the next five years.
3. $0.37 per stock, per week.
4. $375 per week total from trading 100 lots.

Why is money management important? Because it can take an average or even less than average five-year return and produce more than enough profits to retire during that five years. Money management takes the trader past the point of no return. A trader who makes $40,000 over the next two years and then loses the $40,000 during the following two years has a return of $0 (zero dollars) after four years of trading. Had the trader used proper money management, the $40,000 could have grown to $200,000 at the end of two years. Then, when the large losing period came, as much as $100,000 could have been protected. After the trader made it to $200,000, the account was in a position to withstand just about any size **drawdown** (as long as the trader applied money management) without going back down to zero. That is an account that is to the point of no return. The trader applying proper money management is

up $100,000, whereas the trader not applying proper money management is at $0.

Why money management? Because it is responsible for 90 percent of the $1 million in profits shown in the preceding five-year illustration. It isn't the system, it isn't the market being traded, it isn't the alignment of the moon and stars, it is sound, mathematically proven, money management techniques. That's why.

WHAT MONEY MANAGEMENT IS.. . AND IS NOT

Money management is 90 percent of the game. Money management is the most important aspect in trading when it comes to the bottom line. Larry Williams turned $10,000 into $1.1 million in one year. He states in his book *The Definitive Guide to Trading Futures* (Vol. II), "Money management [is] the most important chapter in this book." As a matter of fact, many successful traders rank money management as the highest contributor to their overall success in the markets. If money management is such a critical factor, then it becomes important to know exactly what money management is, and is not.

There are many more or less correct definitions of money management in the industry today. I am going to define the term as I use it and as you will learn it throughout this book. Although some traders insist that if *you* look up *boring* in the dictionary, you will find its definition is "money management," I have learned that it is one of the most fascinating elements of trading.

There are definitions of money management that relate to protective stops otherwise known as "money management stops," but this kind of definition is not used in this book. Money management, as defined here, is limited to how much of your account equity will be at risk on the next trade. It looks at the whole of the account, applies proper mathematical formulas, and lets you know how much of the account you should risk on the next trade.

Money management can then be broken down into two different categories: *proper* and *improper* money management. Proper money management takes into account both risk and reward factors. Improper money management considers one or the other, risk or reward. Proper money management takes into consideration the value of the entire account. Improper money management only looks at certain account properties or characteristics such as winning percentages or win/loss ratios. Proper money management discounts all factors that cannot be mathematically proven. Improper money management suggests that you can consider factors which cannot be mathematically proven. Proper money management says that if A and B then C. Improper money management says that if A and B then C . . . sometimes. Proper money management never dictates where to get in or where to get out of markets. This is better defined as "trade" or "risk" management and should not be confused with proper money management methods.

Nonetheless, some strategies, such as those listed in the previous paragraph, are often lumped into the money management category. And, we cover those strategies as well. For example, money management stops simply are telling you where to exit a market to cut your losses in any given trade. Even though this has a relationship to the money management definition, it is better defined as a "trade management stop" or "risk management stop." Proper money management never has anything to do with where you should enter or exit a particular trade. When placing a stop on any given position, you are determining where the trade will be exited. Money management and money management stops are two completely separate terms.

The trading method known as *pyramiding* also is frequently confused with money management. The trader using money management looks at the account as a whole. Pyramiding on the other hand is limited to a particular trade in a particular market regardless of the status of the account as a whole. Pyramiding says that as a particular trade is profitable, the trader may add positions to try to take advantage of the price moving in the right direction. The further the price moves in the direction of the trade, the more positions the trader adds, generally one at a time. Rarely will you see a pyramiding method that starts one contract and then adds on two more at one price level and three additional contracts at a higher level and so on. Generally, if one is traded in the beginning, each added position is with only one contract. These decisions to add onto positions are not based on the overall increase in the account, just that one position. Further, buying or selling another contract in this situation is based solely on price action.

Another common practice in trading states that you should only take trades after X number of losers in a row. This method is claimed to increase the winning percentage of trading systems. However, it cannot be mathematically proven. In fact, I mathematically disprove the notion that it can increase the winning percentage of trades. This brings in a totally different category of trading though. It does not have to do with how much to risk on the trade. It does not have anything to do with where a trade will be entered or exited. Taking trades

only after X number of losers in a row answers whether to take a trade, when to take trades, and when not to take trades. This does not have to do with how much to risk on the next trade.

In addition to the X number of losers in a row strategy, another strategy that answers whether or when to and when not to take trades is trading according to the x day moving average of the equity curve. This theory requires creating a moving average of the equity curve. Once the actual performance of the equity dips below that average, new trades should not be entered into until after the equity moves back above the moving average. Since this is a strategy that determines when to stop taking trades rather than how much to risk on the following trades, it does not fall under our definition of money management.

Regardless, neither the X losers in a row nor the average equity curve trading method can be mathematically proven to improve trading results. In the chapters dealing with these methods of trading, I examine both the benefits and risks of implementing such methods. Further, I show why you cannot rely on these methods mathematically to improve trading results.

Therefore, the definition of proper money management states that it must take into consideration both risk and reward, it must take into consideration the entire value of the trading account, and it must be proven mathematically. This is a narrow definition and there are only two main methods that comply with it: the Fixed Fractional trading method and the Fixed Ratio trading method. All the methods mentioned in this chapter are thoroughly examined in this book.

WHERE?

Money management principles should be applied to short-term trading, long-term trading, options, stocks, futures, spreads, real estate, and mutual funds. This book, however, deals with the application of money management to leveraged instruments only. Therefore, this is not a book of money management for mutual fund traders. It is also not for stock investors who simply buy and hold for years on end although it does apply to stock traders who use margin. It applies to all types of options and obviously to every market in the futures and commodities group.

There is no type of trading for which money management is not applicable. Some traders mistakenly think that money management is

only for system traders, or system traders believe that money management is only for those who trade by the seat of their pants. The money management principles in this book should be applied to every form or nonform of trading: day trading, seasonal trading, option spread trading, synthetic options, long term, trend following, breakout-the list goes on and on and on. Further, it is especially applicable to any combination of these methods simply because each method or market will either produce a loss or a profit. That loss or profit is not discriminated against according to which market or strategy it came from when applied to the equity curve. Therefore, it simply does not matter.

Inevitably, when I speak at a seminar and try to make this point as bluntly as I possibly can, someone will still come up afterward and ask if this is applicable to the British pound. For clarification, if you take a trade, you should address money management, period, end of story . . . that's all she wrote.

WHEN?

When should a trader start applying money management to trading? In a word, yesterday. Money management planning should be a conscious part of preparation even before taking the first trade. Every single trader who has ever made a trade of any kind has one thing in common with every other trader-they all made a money management decision when they decided how many contracts or options or markets or risk to place on the very first trade. Further, with every single trade, the trader is making a money management decision even when unaware that this is the case. You are, right now, applying some sort of money management decisions to your trading. My goals are, first, to make you aware of these decisions; second, to convey that they should be your top priority in trading; and, third, to give you the proper money management techniques to make the most out of your trading.

If you have already started trading, it is time to reorganize and replan the strategy from here on out. It matters not whether you are trading one contract or one option or whether your account size is $5,000 or $5 million. You need to apply proper money management strategies now.

If you haven't started trading, you may be tempted to shove money management aside for now. Don't! Many believe money management is just an after-the-fact, or after-money-is-already-made scenario. The following story illustrates this attitude. Several years

ago, a trader was excited about the potential effect of money management on the outcome of his trading. He called me up and bought my Performance I money management software program. A year later, I received a call from the same man. I got on the phone with him and he said to me, "Ryan, I am ready to use the money management program now, could you help me get started"? A bit baffled, I said, "Sure, but why did you wait a year to start using the program?" He replied that he wanted to make sure that the method he was going to trade worked first. I said, "Fair enough" and proceeded to help him out. Toward the end of the conversation, I asked, just out of curiosity, how much he had made without applying money management. He answered that he had made about $70,000 based on trading a single contract! After I got off the floor, I told him that had he used money management from the beginning, he could have easily produced in excess of $600,000 instead of $70,000.

When? Now!

WHO?

Even though this answer has been indirectly answered through the answers to the other questions, let me be direct and to the point. You. If you are even contemplating trading a leveraged instrument, whether it be stocks, commodities, options, or whatever other leveraged market, you must address the money management issue. If you are already trading, you are running late and behind, but late is better than never. You need to apply these techniques. It doesn't matter where you went to school, your age, sex, color, race, or religion. Whether you are a mother, father, brother, sister, cousin, nephew, niece, aunt, or uncle, it matters not. Am I getting the point across? Numbers have no respect for humans. They just are.

HOW?

This is probably the only question that I cannot automatically assign the same answer to everyone. How you apply these principles to your trading is going to be different from how someone else views and applies them. How you apply these techniques will depend on several factors including but not limited to how conservative or aggressive you are, your goals as a trader, and your tolerance for risk.

The basic principles of this book apply to all traders. Whether aggressive or conservative, every trader applies the same principles and mathematically proven money management techniques. Questions such as when and who should be aggressive or conservative are answered in the following chapters.

I hope this chapter has convinced you to read on. The numbers alone are convincing enough. If you have never consciously addressed money management in your trading, you may need to go through this book a bit slower than those who have. But if you take the necessary time and stay the course, this will be one of the most beneficial books you will ever read in your trading career.

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WHY (PROPER) MONEY MANAGEMENT?

All traders have one thing in common. Whether you are an options trader, a day trader, a stock trader, or a little bit of everything type of trader, you are-at least in one way-like every other trader. No matter what the market or method, every trader must make a money management decision before entering a trade. Sometimes this is not even a conscious decision. For these traders, money management never even crosses the scope of intentional thought. This is an extremely dangerous way to trade. It is amazing to me how much time traders spend researching where to get in and where to get out of the markets but then allocate to each trade with little more than a dart throw. Through my own experiences and a few illustrations, I hope to convey that proper money management is the key to success in trading.

In this chapter, I explain why and how I turned my focus to money management and then present several reasons you, and every other trader, should focus on how to manage the money in your account, even before you decide on what system or method to trade.

When I trade, I examine something to a certain degree, make a judgment call whether it is worth trading, and then do it. Paper trading can yield only so much information. The true story lies behind the outcome of actually taking the trades. During one of my early trading experiences, I had opened an account for $10,000. This was, at the time, the most I had invested in a new trading venture. I also had decided to trade straight futures with this account. Until then, I had traded options, option spreads, covered options, futures spreads, and had written naked options. I had never traded straight futures

consistently. However, I had just purchased a new trading system from one of those guys who was retiring from a long life of profitable trading and had decided to reveal his age-old, proven trading method to a few honored select traders for $100. I qualified because I had $100. And, just for the record, I think the manual is still for sale if you want to get your hands on a copy.

Anyway, I had coupled his method with some of my own analysis I was doing in the markets. I had noticed something that I thought would be a very high probability trade-divergences. I decided that if I saw a divergence setting up, I would use the entry and exit techniques described in this $100 manual. Soon after opening the account, I began trading these signals. There were, however, entirely too few of them to make me happy. So, I started doing some other things in the account to beef up the activity. Surprisingly (not then but now), I did very well. At the ripe old age of 21, I took a $10,000 account and turned it into more than $20,000 in just four months. Because all of my previous trading ventures had been complete failures, I was absolutely elated at this new-found success. Downright cocky might be a better phrase for it. I thought I had it made. And, it wasn't because of some lucky trade that I had wandered onto. I had methodically, trading 20 markets, inched the account, trade by trade, to more than a 300 percent annualized return. At the age of 21, I had achieved a status that only 10 percent of all traders achieved-positive results.

That was on Thursday. On Friday, I was taking my wife on a little weekend getaway. After driving for a few hours, I decided to stop, call my broker, and find out how my 11 positions were doing. I was in everything from natural gas to sugar. In several of the markets, I had two or three contracts. When I called, I was informed that 9 of the 11 positions had gone against me. Although it certainly wasn't devastating, I did not have the margin to carry all 11 positions through the weekend. Therefore, I liquidated a few of those, rationalized that the others would make up the slack on Monday and went on my way. I was a little disappointed and even a little worried, but far from being devastated. That state was still to come.

Two weeks later, my $20,000+ account had plummeted to less than $2,500! Now, I was devastated. My pride had been crushed and I was right back among the 90 percent of people who lose money trading. What happened? That was my question. I decided to take some time off from trading and investigate exactly what had happened to

this account. I was going to figure out what had caused the collapse if it was the last thing I did. Defeat is only temporary.

After analyzing the trades, I determined that the most reasonable explanation for the demise was overtrading the account. However, this was new territory to me. My first account was a $2,500 account where I bought five bond options (or five of one market, I am not sure whether it was bonds or crude oil). I put the whole amount, into that market. Two weeks into the trade, I had doubled my money. The day the market went my way, causing the prices of the options to spike, I called my broker to get out. However, he convinced me that the market was going to continue to move in my direction and that I should definitely not get out yet. So I didn't. Two weeks after that, my $5,000 was down to about $300. I concluded that instead of overtrading, my mistake was not getting out while the getting was good.

A few accounts after the option debacle, I had ventured into trading option spreads. I had been tracking OEX (Standard & Poor's 100 Stock Index) option time spreads. You would buy the near month option and sell a deferred month and profit off the decay of the deferred month with protection. After tracking these for awhile, I spotted a tremendous opportunity in the British pound options. I noticed a huge discrepancy in the price of the near month option against the price of the deferred month's option price. After much calculation on how much I was going to make off this trade, I decided to place 20 spreads with my $7,500 account. I knew that my risk was limited and that I would not be charged more than the difference between the two options for margin. Too bad my broker didn't know this.

A few days later, the broker called me and left a message stating that I was considerably undermargined. Thinking that this was a mistake (and because I was actually making about $100 on each spread), I didn't bother calling him back right away. A few days after that, I had nearly doubled my money with the trade and decided to get out not wanting to repeat the mistake I had made with the crude oil options. So, I called the broker and exited the position at the market. I learned several important lessons that day. First, British pound options are not very liquid. Second, a September British pound option is based on the September contract of the British pound. A December British pound option is based on the December contract of the British pound. Third, full margin is charged in this situation.

Instead of making $7,500 on the trade, by the time I closed both ends of the trade, slippage brought me down to actually netting a negative $500 on the trade. When I added in the slippage and $35 per round turn-40 of them-1 lost about $2,000 on the position that supposedly was making me close to $7,500!

Next, I was chewed out for not returning the call regarding the margin deficit. I was informed that I was being charged full margin for the short sell of the options because they were on the December contract and therefore were not offset by the September option purchase. They were about to liquidate my position with or without my consent (rightfully so, I might add).

Even though I had placed far too many British pound option spreads in that account, I did not learn about overtrading the account. This little lesson eluded me until I analyzed why my straight futures trading took me to over $20,000 in four months and down to less than $2,500 in two weeks. Not being absolutely certain of my conclusion, I did a little research on the subject.

This was a major turning point in my quest to succeed at trading. I picked up a book called ***Portfolio Management Formulas,*** by Ralph Vince (New York: John Wiley & Sons), and was stunned by one of the examples in that book. Even though the book is highly technical and impractical for most traders, it does an excellent job of revealing the importance of money management. The following example from that book confirmed my original conclusion that I had simply overtraded my account and also illustrates why traders need proper money management,

Take a coin and flip it in the air 100 times. Each time the coin lands heads up, you win two dollars. Each time the coin lands tails up, you lose only one dollar. Provided that the coin lands heads up 50 percent of the time and tails up the other 50 percent of the time and you only bet one dollar on each flip of the coin, after 100 flips, you should have won a total of $50.

100 flips

50 flips land heads up. 50 x $2 = $100

50 flips land tails up. 50 x ($1) = ($ 50)

$100 + ($50) = $ 50

(Note: This is a fictitious game. I have had some traders call me and tell me that this doesn't simulate real-time trading. My response is that it is not meant to simulate real trading, only to show the power and demise of money management.)

Obviously, this is an ideal betting situation. Since we can spot the profitable opportunities here (being the astute traders that we are), we are not going to bet just one dollar on each flip of the coin. Instead, we have a $100 account to bet in this game. There are many possible ways to bet the scenario. However, you must choose one of the following four options:

A. Bet 10% of the total account on each flip of the trade.
B. Bet 25% of the total account on each flip of the trade.
C. Bet 40% of the total account on each flip of the trade.
D. Bet 51% of the total account on each flip of the trade.

These are the four options. If you choose A, you will multiply the account balance by 10 percent and bet that amount on the next flip of the coin. You will then take the total amount won or lost plus the original amount bet with, place them back into the account and multiply the total by 10 percent again and bet with that amount. Therefore, starting with $100 and multiplying it by 10 percent gives you $10 to bet with on the next flip. If that flip is a winner, you win $2 for every $1 you bet with. Since you bet with $10, you win a total of $20 on the first flip ($10 x $2 = $20). Take the $20 and place it back into the account and you now have $120. Multiply this by 10 percent and you will bet $12 on the next flip. If the next flip is a loser, you will lose only $12 which will bring the account down to $108. You get the picture. Do the same if you choose B, C, or D.

The results are as follows:

A. After 100 flips, $100 turned into $4,700.
B. After 100 flips, $100 turned into $36,100.
C. After 100 flips, $100 turned into $4,700.
D. After 100 flips, $100 dwindled to only $31.

The whys and hows of this illustration will be dealt with later in the book. For now, I want to point out two critical facts about money management. First, it can turn a relatively mediocre trading situation into a dynamic moneymaker. For a trader who staked a flat $10 on every trade without increasing the size of the bet, the net value of the account would have only been at $600. However, increasing and decreasing the amount of each bet increased the return by 683 percent. If a trader would have bet a flat $25 on each flip, the net value of the account would have ended at $1,350. By increasing the amount bet as the account grew, the return was increased by 2,788 percent. If the trader were to bet a flat $40 on each flip, after suffering two losses in a row, the trader would be unable to continue. Therefore by *decreasing* the amount risked on each flip, the trader was able to stay in the game.

Second, risking too much on each trade can also turn a winning situation into a losing scenario. Even though the trader would never totally deplete the account (theoretically), the decrease would amount to a 79 percent loss after 100 flips.

This illustration shows that improper money management can turn a winning situation into a losing situation. However, no amount of money management will mathematically turn a losing situation into a winning situation.

NEGATIVE VERSUS POSITIVE EXPECTATIONS

Even though this book does not get deeply involved in probabilities and statistics, it touches on the aspects required for the application of proper money management. This is where positive and negative expectations come in.

Put simply, the trader must have a positive expectation to apply proper money management. In addition, traders must experience a certain degree of positive return. The definition of a positive expectation can be reduced to the statement that there exists a mathematically proven probability that the trader will end up with profits, not losses. The coin example is a positive expectation scenario based on the following math:

Probability of winning trades = 50%
Probability of losing trades = 50%
Amount of each win = $2
Amount of each loss = $1

The mathematical equation for a positive expectation is as follows:

$$[1 + (W / L)] \times P - 1$$

Therefore, the preceding example would yield a mathematical expectation of:

$$(1 + 2) \times .5 \quad 1 =$$

$$3 \times .5 - 1 =$$

$$1.5 - 1 = .5$$

Positive expectation is defined by the outcome of this equation being greater than zero. The greater the number, the stronger the underlying statistics. If the outcome is less than zero, then the mathematical expectation is also negative. The greater the negative, the more negative the situation is. If the outcome is exactly zero, then the expectation is breakeven.

Traders can use the mathematical formula in two situations. The first is where the wins are all the same size and the losses are all the same size. However, the wins, can be a different size than the losses. The other scenario where it is useful is when taking averages of the wins and losses. Obviously, this probability equation is applied to a historical win/loss record and cannot be used for predictive purposes. There is an equation that accounts for a scenario where the size of the wins and losses can be an infinite number of possibilities. This equation is useless for the purpose of trading as it is applied to the historical win/loss record. The probability of winners to losers of any particular system or strategy is only estimated according to back testing as well. Therefore, before the equation can have any numbers placed into it, there must be a back history. As a result, we will stick with the equation given and simply gauge the strength of the historical track record. When flipping coins, we already know the future probability regardless of the past outcome of any number of flips. We do not have this information in the real world of trading.

A following example uses this equation in a historical track record. Where the probability of winning was 63 percent and the average winning trade was $454 and the average losing trade was $458, the mathematical expectation is:

$$[1 + (W / L)] \times P - 1 =$$

$$[1 + (454 / 458] \times .63 - 1 =$$

$$1.99 \times .63 - 1 = .2537$$

Compare this with the strategy that has the following statistics:

Average win = $2,025

Average loss = $1,235

Percent profitable = .52

$$(1 + 1.64) \times .52 - 1 =$$

$$1.37 - 1 = .37$$

This system has a slightly higher mathematical outcome than the preceding statistics. The following statistics have this mathematical outcome:

Average win = $3,775

Average loss = $1,150

Winning probability = 65%

Mathematical outcome = 1.78

This mathematical outcome is not predictive in nature and can only be used to gauge the strength of a system's past results. This is, in any case, the only use for historical statistics.

Knowing that money management is simply a numbers game and needs a positive expectation to work, the trader can stop looking for the Holy Grail method to trading. The trader can stop trying to make a home run in trading. The trader, instead, can concentrate on making sure that the method being traded is logically sound and has a positive expectation. The proper money management techniques applied to these mediocre performing methods will do the rest.

3

TYPES OF MONEY MANAGEMENT

The goal of this chapter is not to differentiate the "good" money management methods from the "bad" money management methods but to give the reader a general overview of the principal money management ideas and methods. Most money management methods fit one of two categories: martingale or antimartingale.

MARTINGALE MONEY MANAGEMENT

The martingale category simply states that as the value of an account is ***decreasing,*** the size of following trades ***increase.*** The basic characteristic of the martingale is that as the account suffers losses, the ability to make up those losses either ***increases*** or stays the same. This is a popular type of money management for gamblers. As stated in Chapter 2, no type of money management can turn a negative expectation scenario into a positive expectation. As a result, gamblers are not trying to change the odds, but rather are trying to take advantage of streaks. Consider the following example.

Flip a coin 100 times. You have a choice to bet on either heads up or tails up on each flip. However, when you win, you only win $4 and when you lose, you lose $5. This is a negative mathematical expectation. If you were to bet $5 every flip of the coin, you would end up losing $50 after 100 flips of the coin:

50 flips x ($5) = ($250)

50 flips x $4 = $200

($250) + $200 = ($50)

However, you will only bet after a streak of three in a row and you will bet opposite of that streak. Therefore, if the coin lands heads up three times in a row, you will bet the next flip of the coin to be tails up. If you lose, you will double your bet on the next flip to be tails up. If you lose again, you will double your bet on the next flip to be tails up. After three losses, you will quit.

For the illustration, I actually flipped a coin 100 times to come up with the streaks to simulate actual performance. Out of those 100 flips, there were 16 streaks of 3 in a row of either heads or tails. Out of those 16 streaks of 3 in a row, 10 generated an opposite result of the streak on the very next flip. For those 10 times, we won $4 per win, or $40 total. There were three times that generated an opposite result after the fourth flip. For those three streaks, we lost $5 on the first bet and won $8 on the next. We came out $9 ahead for those three times, bringing our winnings up to $49. Twice, the streak went 5 in a row and then generated an opposite result on the next flip. For those two streaks, we lost $5 on the first bet, $10 on the second bet, and won $16 on the third bet for a net of only $1 each time. This brought our total winnings up to $51. However, there was one streak that lasted tails up 8 consecutive times. For this streak, we lost $5 the first bet, lost $10 the second bet, and lost $20 the third bet and had to quit. For this streak, we lost a total of $35. This brought our total winnings down to only $16.

This is a classic example of gamblers trying to take advantage of streaks. The only way they lose in this situation is if the streak lasts for 6 consecutive flips. However, this is still not a positive mathematical expectation. We discuss the mathematics of streaks later in the book. For now though, I think it is enough to let you know how the next set of 100 flips went. On the next 100 flips, there were 9 streaks of 3 consecutive flips heads or tails. Only 4 of them, however, generated an opposite result on the fourth flip. With those 4 streaks, the winnings were $16. Only one streak generated an opposite flip on the fifth flip of the coin. With that streak, $3 was added to the total, which now stood at $19. Two streaks ended on the sixth flip of the coin bringing in $1 per streak and the total to $21. There were two flips that lasted for more than 6 consecutive heads or tails. For each

of those streaks, losses of $35 per streak were realized. This brought the total for the second set of streaks to negative ($49) and the total between both sets at negative ($33).

The theory behind doubling the size of the bet is that eventually, the streak has to come to an end. If you were to double $100 ten times, however, you would end up with $102,400. At twenty times, you would end up with $104,857,600. At thirty times, you end up with $107,374,182,400. One of two things will happen eventually. Either the streak will end, or you will run out of money completely. This means that going through the sequence enough times, you will, eventually, run out of money because you only have to do that once and it is over.

The martingale theory does not mean that the following trades have to double in size. For example, a trader is trading 10 contracts where the potential loss on any given trade is $1,000 per contract and the potential win on any given trade is $800 per contract (no exceptions from these two figures for the sake of the example). If he suffers a losing trade, the total loss on the trade is $10,000. To make up for that $10,000 loss, the trader might increase the number of contracts to 13 on the next trade. This would bring in a total of $10,400 if the next trade were to be a winner. If it is a loser, however, the loss will be at $13,000 for the trade and $23,000 between the two. The trader has a couple of options at this point. The next trade size can try to make up for the total loss (29 contracts and not really an option) or it can only try to make up for the previous loss (17 contracts). Obviously, this is not a very good situation either way. The trader is looking at $40,000 in losses minimum should the third trade be a loser and up to $62,000 in losses at 4 losers in a row.

These are but a few ways of using martingale money management methods. This type of money management is definitely not recommended for the futures, stock, or options trader. The risks are far too great and there are better, more efficient methods to manage the money.

ANTIMARTINGALE MONEY MANAGEMENT

The obvious definition of an antimartingale money management method is exactly the opposite of the martingale methods. As an account increases, the amount at risk placed on future trades also increases. The main characteristics of antimartingale methods are

that it causes geometric growth during positive runs and suffers from what is called asymmetrical leverage during drawdowns. Asymmetrical leverage simply states that as an account suffers losses, the ability to make up those losses decreases. If a 20 percent drawdown is suffered, a 25 percent gain is required to get back to even. A 10 percent drawdown requires an 11.11 percent gain to get back to even. The formula for this is:

$$[1/(1 \quad \% \text{ loss})] - 1 = \text{Required \% gain}$$

In many cases, asymmetrical leverage does not affect trading. For example, if a trader trading the absolute minimum available in the bond market (which would be a single contract of the bonds traded in Mid-American Exchange) suffered a 20 percent drawdown, the required gain would still be 25 percent of the new account balance, but the ability to achieve the extra 5 percent has not diminished. This occurs because even though the percentage required to recoup the percentage loss of the account increases, the amount of capital to recoup the amount of capital lost remains the same. Therefore, asymmetrical leverage does not play a role in the performance of the account.

On the other hand, it plays a huge role when traders apply certain money management techniques. For example, if a trader decides to trade one contract for every $10,000 in the account, then a single contract would be traded from $10,000 through $19,999. At $20,000, contracts would increase from one to two. Suppose that the very first trade after increasing to two contracts is a loser for $1,000. Since there were two contracts on this trade, the actual loss comes to $2,000 and the account goes to $18,000. According to the money management rules, a single contract has to be traded once again. The trader must now incur two, $1,000 winning trades to get the account back to where it was just prior to suffering a $1,000 loss with two contracts. Here, the amount of capital required to bring the account back to even remains the same, but the ability to achieve that amount has decreased by 50 percent. That is asymmetrical leverage and it can be detrimental. Later in this book, I present some ways to avoid it or at least diminish its effects in the practical realm of trading.

The positive aspect of the antimartingale money management method is that it places the account in a position to grow geometrically.

When I started my research into the money management arena, only one type of money management was generally accepted in the industry. That method is called Fixed Fractional trading. Fixed Fractional trading is an antimartingale money management method. It is the same type of method used in the coin flip example in Chapter 2. Fixed Fractional money management simply states that on any given trade, x% of the account is going to be allocated, or at risk. The coin flip example allocated 10%, 25%, 40%, or 51% of the account on every flip of the coin. Chapter 5 in this book provides a detailed explanation of the Fixed Fractional method so I am not going into detail with it at this point. You should note, however, that the Fixed Fractional method takes on many different names. Regardless of their names or how the methods are explained, the following are all Fixed Fractional money management methods:

- *Trading one contract for every x dollars in the account.* I used this example earlier when describing asymmetrical leverage (1 contract for every $10,000 in the account).
- *Optimal f.* This is a formula made popular by Ralph Vince. The "f" stands for fraction. It is the optimal fixed fraction to trade on any given scenario. The coin flip example yielded $36,100 by risking 25 percent of the account on each flip. This percentage represents the Optimal f of that particular situation. No other percentage will yield more than the $36,100 in that example. However, Optimal f for one set of trades is not necessarily Optimal f for another.
- *Secure f.* This is just a "safer" mode of the Optimal f and will be touched on in Chapter 5.
- *Risking 2 percent-3 percent on every trade.* This money management practice is common among trading advisers and fund managers.

After doing extensive research on the Fixed Fractional method, I was not satisfied with its characteristics. Therefore, I developed something called the Fixed Ratio™ money management method, which has nothing in common with any type of Fixed Fractional method except that all these methods are types of antimartingale money management.

These are the basic methods from which most other specific money management ideas are derived. The martingale methods are not discussed here in any more detail since they are never recommended in this book. However, this book provides detailed information on all antimartingale types of money management mentioned earlier.

COST AVERAGING

This is not a type of money management in the pure sense of the word. Nonetheless, this is the most logical place in the book to fit it in. Cost averaging is mainly popular in the stock and mutual fund industry. It is not nearly as popular with traders in leveraged instruments and there is a reason for that. Cost averaging is also not a pure money management method simply because the decision to cost average is directly related to market action. Further, it is more concerned with where to get into a particular market than it is about *how much* to risk. As mentioned earlier, money management in the truest sense is completely unrelated to where to get in and where to get out of the markets.

The simplest definition to cost averaging is to add onto a losing position. There are exceptions, but this is the most common use of the method. For example Joe Trader invests $5,000 in a mutual fund at $17.00 per share. Most mutual funds allow fractional shares and therefore Joe Trader has 294.11 shares (provided there is no load). As time moves along (as it normally does), the price of the mutual fund slowly drops. Several months later, Joe Trader decides to invest an additional $5,000 into the fund at $14.80 per share. Because of the drop in price, Joe is able to purchase 337.83 shares of the fund with the second $5,000 investment. Joe now owns 631.94 shares of this mutual fund at an average cost of $15.82. Joe's average price for each share of the mutual fund dropped from the original price of $17.00 down to $15.82. Thus, the price of the mutual fund does not have to move back up to $17.00 for Joe to recoup the losses from the initial $5,000 investment, it only has to move up to $15.82.

$15.82 avg. price x 631.94 shares = $9,997.29
(if we carry the decimals further it will total $10,000)

$10,000 total invested / 631.94 total shares = $15.8242 avg. share price

This can go on for a considerable time. If the share price of the fund continues to drop, Joe may have a plan to invest an additional

$1,000 for every $.50 the price drops from $14.80. If the price drops to $12.00 per share, Joe will have invested as follows:

$1,000 at $14.30 p/s = 69.93 shares	Total shares = 701.87
$1,000 at $13.80 p/s = 72.46 shares	Total shares = 774.33
$1,000 at $13.30 p/s = 75.19 shares	Total shares = 849.52
$1,000 at $12.80 p/s = 78.13 shares	Total shares = 927.65
$1,000 at $12.30 p/s = 81.30 shares	Total shares = 1,008.95

Joe now has $15,000 invested in this fund at an average cost of $14.87 per share. For Joe to recoup the losses, the fund has to move up to $14.87 per share. If the fund moves all the way back up to $17.00, then Joe will have profits of $2,152.15, or a 14.34 percent gain on his investment. If Joe did not cost average, the investment would simply be a breakeven.

There is a time and place for cost averaging. That time and place is when the investor does not have to liquidate. This is exactly why it is not popular in the leveraged instrument arena. Joe never has to come up with more money to be able to hang onto the mutual fund. However, if Joe decides to buy coffee at $1.10, Joe does not have to put up $41,250 to do so. (This is the total price of a coffee contract at $1.10 per pound with a minimum 37,500-pound purchase.) Joe only has to put up the margin, which will probably be anywhere from $4,000 to $7,000 depending on the volatility.

Using the same type of scenario as in the mutual fund, Joe invests $5,000 in coffee. With that $5,000, he is able to buy one contract. If coffee moves down to $1.00 and Joe takes another $5,000 to buy an additional contract, he will have two contracts of coffee at an average cost of $1.05 per contract. However, he is losing a total of 10 cents on the trade. Ten cents in coffee is $3,750 (.10 x 37,500). If coffee drops another 10 cents, Joe will be losing 15 cents per contract, or 30 cents total, which comes to a loss of $11,250 on a $10,000 investment. Obviously, Joe cannot take another $5,000 and invest it in another contract of coffee because the broker is going to want that and more to maintain the current two positions. If Joe cannot immediately fund the account, the broker will liquidate and Joe will not only have lost his $10,000, he will also owe an additional $1,125.

A rule of thumb when trading leveraged instruments is, *do not add onto losing positions* unless you will not have to liquidate.

If played correctly, there are times that cost averaging can be utilized in the futures arena. Back in April 1997, orange juice was trading at $.68 per pound. Since the value of one contract in the orange juice market is 15,000 pounds, the total value of the contract was only $10,200. For those of you not familiar with this market, the lowest orange juice has been since 1970 is about 32 cents (early 1970s). After the inflation boom in the late 1970s and early 1980s, the lowest orange juice reached was around 63 cents in early 1993. By late 1993, the market had moved back up to the $1.30 level (a total value of $19,500 per contract). I had done some research and determined that if orange juice had traded at 32 cents back in the early 1970s, the equivalent price after a 2 percent annual inflation rate should be around 58 cents in April 1997. As a result, I was extremely confident that orange juice would not go back to the 32-cent level then, and quite possibly never. Therefore, I decided that I should buy one contract for every $5,000 I was worth (even though margin was only around $800). I decided this with the intention of being able to continue to hold onto the positions even if the bottom dropped out of the market and went below the 58-cent inflation adjusted price level. And, if it went to 58 cents, I was prepared to buy more (cost average) because I would not have to liquidate, even if I were wrong on the timing and the bottom. This is when you cost average in the futures market.

There is actually a positive to cost averaging in the futures markets in these situations over cost averaging in the stock market or mutual fund industry. The value of stock is based on the performance of the underlying company. Companies can go bankrupt. If you are cost averaging a stock and it goes bankrupt, you lose your entire investment. Or, stocks (as well as mutual fund companies) may drop, continue to drop, and never, ever move back to the levels at which you bought them. Commodities on the other hand, will never go to zero value. Will orange juice ever be free? Can it go bankrupt? Is the price movement dependent on human actions? The answers to these questions are obviously no. I don't care what farmers try to do, how much they try to grow or not grow, if a massive, prolonged freeze hits Florida in January, or Brazil in July, orange juice prices are going to move, and they will move fast. In fact, since 1980, orange juice has been below 80 cents four times. Each time (except for the most recent move below 80 cents in April 1997), the price has bounced to over $1.30 within a two-year time period of hitting those lows. It took about 1½ years but in late 1998, orange juice hit $1.30! Had a fund manager simply bought one contract of orange juice for every $5,000

under management at each of these times and liquidated at $1.25, they would have an annualized return of, 18 percent for the past 18 years with virtually no risk. A $5,000 investment would have grown to over $105,000! A total return of 2,100 percent:

1980: Bought 1 orange juice contract at 80 cents.

1981: Closed out at $1.25 for a $6,750 profit per contract.
Account value = $11,675.

1986: Bought 2 orange juice contracts at 80 cents.

1986: Closed out at $1.25 for a $13,500 profit.
Account value = $25,175.

1993: Bought 5 orange juice contracts at 80 cents.

1993: Closed out for a $33,750 profit.
Account value = $58,925.

1997: Bought 11 orange juice contracts at 80 cents.
Current value = $1.08 for open profits of $46,200.
Current account value = $105,125.

One other rule of thumb about cost averaging before moving on. Never cost average a short sell! Cost averaging in commodities is based on the fact that prices of anything cannot go below zero. With commodities, the closer to zero, the safer the investment. However, short selling a market because you think the market cannot possibly go any higher is nothing short of trading suicide. Traders who sold silver at $10 an ounce back in 1979 will verify this.

PYRAMIDING

Pyramiding is also widely mistaken as a money management method; however, like cost averaging, it is directly related to the performance of the particular market being traded. Pyramiding is the exact opposite

of cost averaging. Pyramiding is simply adding to a winning position. If Joe Trader invested $5,000 in a mutual fund at $17.00 per share, then Joe would invest another $5,000 if the mutual fund went up to $18.00 (or at whatever price Joe decided to invest more as long as the price was greater than $17.00).

The logic behind pyramiding is that if a particular trade is moving in the preferred direction, then the market is probably trending and additional investments are made with the hope that the market will continue in the direction of the current trend. It can be very powerful. However, it can also be disappointing if the market doesn't continue to move in the desired direction. The following illustration captures the characteristics of pyramiding.

Joe Trader has bought an orange juice contract at 80 cents and plans to buy another contract at every 5 cents the market moves up. Therefore, if the market goes to 85 cents, Joe will buy another contract, and another if the market goes to 90 cents, and another at 95 cents, $1.00, and so on.

Pyramiding

$1.05 current price – $.925 average purchase price= $.125 profit per contract

$.125 x 6 contracts = $.75 total profit. $.75 x 15,000 = $11,250

Not pyramiding

$1.05 current price – $.80 purchase price = $.25 profit

$.25 x 15,000 = $3,750 total profit

To protect $3,750 in profits with pyramiding

$3,750 profit / 6 contracts = $625 per contract

$625 profit per contract / 15,000 pounds = $.0416

$.925 average purchase price + $.045 (rounded up) = $.97 (or $625 per contract)

What happens if after Joe buys at 80 cents, the market moves up to 85 cents and Joe buys another contract; but then the market moves back down to 80 cents? Instead of breakeven, Joe will have losses of 2½ cents per contract ($750 loss = 2½ cent loss × 2 contracts x 15,000 lbs.). If the market moves to 90 cents and Joe buys a third contract, the losses will be 5 cents per contract ($2,250 loss). However, if the market continues to move higher to $1.05, Joe will have bought a total of 6 contracts at an average price of 92.5 cents [(.80 + .85 + .90 + .95 + 1.00 + 1.05) / 6] = 92.5 cents. The total open position profit on the trade is at $11,250. Had Joe not used the pyramiding method, the profit on the trade would only be at $3,750. Further, Joe can let the market move down to 97 cents and still make $3,750 on the trade with the pyramiding method.

This illustration neither promotes nor discourages pyramiding. There are obvious risks to be considered for the extra potential reward. Most of the risk comes on the front end of the method, while most of the reward comes in on the back end. The key is to make it to the back end.

Finally, the decision to pyramid is completely separate from the total performance of the account. For example, if an account started with $20,000 and because of a series of losing trades is down to $17,000, the ability to pyramid the orange juice market is based on whether that market moves up regardless of whether the account as a whole is in the red. This is another reason that it must not be confused with money management. In pyramiding, the trader decides whether to get in based on market action.

4

PRACTICAL FACTS

The practical facts discussed in this chapter are helpful in understanding the practical application of money management methods to your trading. Read this chapter carefully to form an idea of how to apply what you learn in this book to your own trading. These facts include where to begin, application as related to different systems and markets, asymmetrical leverage, and the role of margin requirements.

WHERE TO BEGIN APPLYING MONEY MANAGEMENT

This is one of the most common questions I receive, as well as one of the most common areas for serious mistakes by traders. Traders tend to believe that they do not need to address money management until sometime in the future, after they are making money. They want to "prove" that a particular strategy will work before they decide to apply any money management methods. This can be a costly mistake. Recall the trader who made $70,000 without applying money management just to prove that the strategy was going to make money first. It cost him about $600,000 in profits during that year. I could probably rest my case with that example, but I want to explain the "whys" here.

First of all, proper money management will not come into play unless there are profits in the account. Remember that with the antimartingale type methods, as the account grows, the amount to be risked on each trade also increases. Therefore, the application of proper money management requires some degree of success or proof

that the strategy makes money. However, that amount of proof is nowhere near the $70,000 level. That is one of the reasons for this mistake. Traders want to prove that the method makes money, but they wait too long.

Second, there is little additional risk in applying money management from the beginning instead of not applying it at all. That additional risk is associated with asymmetrical leverage, which has already been touched on and is further analyzed in Chapter 7. That additional risk is realized only if the account makes it to two contracts, immediately drops back to one and continues to suffer a drawdown below the original starting account size. If the starting account balance was $20,000, was scheduled to increase to two contracts at $25,000 and suffers a $1,000 loss right after that increase, the amount lost is an additional $1,000. If the account continues to drop below the original $20,000, there will be a one time loss of $1,000 that would not have been there if the money management had never been applied. The flip side is the potential $500,000 in profits you are risking by not applying proper money management. Let's see, a $1,000 risk to $500,000 reward ratio . . . hard decision!

Third, if the account follows the scenario described in the previous paragraph, the scenario did not turn out to be a positive expectation. As stated earlier, no money management scheme can mathematically turn a negative expectation into a positive gain.

If you are actually risking your money in the markets, you most likely are doing so with a strategy that has a positive expectation. In that case, you should apply money management from the beginning based on your expected performance. The only reason a trader should not apply proper money management principles from the beginning is if that trader actually expects to lose. And, if that is the case, why trade?

PRACTICAL APPLICATION THROUGH DIFFERENT SYSTEMS AND MARKETS

This is another area of common confusion when money management is concerned. I often receive questions about whether my money management methods work on the British pound, or whether they work with buying options, selling options, stock trading, or whatever the market may be. To be as direct as I possibly can about this subject,

proper money management can be used on any leveraged trading situation, regardless of the market. It doesn't matter whether the market is the British pound or potatoes. It doesn't matter whether the market is IBM stock options, or the S&P 500 Index.

Proper money management is based on one thing only, account performance, otherwise known as the equity curve of the account. I closed out a trade yesterday for a $500 profit. That profit will go into my account and increase the account value by $500. Can you tell me what market produced the $500? Of course not . . . and neither can the equity curve. It simply does not matter where the money came from or how. Five-hundred dollars is worth just as much in my account whether it came from a time spread placed in the OEX options or from a futures trade in Lumber.

Related to that topic is a common question of whether the money management methods can be used on a particular trading style or trading system. The answer is the same as before about the markets, and for the same reasons. Can you tell me what system that $500 profit came from? No and neither can the equity curve. Both system and market are irrelevant when it comes to the application of these money management principles.

Nevertheless, the most practical applications are on leveraged instruments, even if they are only 50 percent leveraged, such as short-term trading stock markets. The uses are impractical where the investor is not leveraged and is reinvesting 100 percent of the profits. When there is no leverage, there generally is little risk of losing the entire investment, especially if the investments are diversified. This is the only exception. I do want to point out that when investors reinvest 100 percent of their capital, math is taken out of the equation for success.

THE ROLE OF MARGIN REQUIREMENTS

A margin requirement is simply an amount of money required for collateral to place a trade, commonly used in the futures arena or in writing options. This amount is set by the exchanges on which the markets are being traded and is usually determined by the value and volatility of the underlying market. There are no set formulas among the exchanges to determine margin requirements. Each margin requirement is subject to change for any reason, at any time, without prior warning. For example, the required margin to trade the S&P 500 used to be

$10,000. However, due to the volatility in that market during the time this book was being written, the margin requirement was somewhere around $20,000. The current value of one S&P contract is approximately $270,000. Therefore, you can benefit from the movement of a $270,000 instrument with only $20,000 in your account. The catch is that if the value decreases from $270,000 to $250,000, you will lose your entire $20,000.

There are a couple of things to remember when associating margin with trading and in particular, money management. Actually, there is only one thing to remember about that . . . don't. The exchanges did not set these margins with the intention of helping you and me (the traders) out with our trading. They set the margin rates for their protection and their financial gain. That being the case, do not base any trading decision on margin requirements . . . ever. Simple as that. Rarely, if ever, will recommended money management techniques be more aggressive than the margin required to implement them.

The current margin requirement for trading a full bond contract is $3,000. If I open an account for $3,000 because that is the margin requirement, and then trade a contract in the bond market, the very day that position goes against me, my broker will be calling me for additional funds to place in the account. If I don't send it, the position will be liquidated.

The question then is, what is the proper amount to start a trading account and still be able to apply proper money management principles? There is no magic answer to this question; however, there is a logical minimum. The main reason that new businesses fail is undercapitalization. That is also the case for traders who get involved with leveraged instruments. Then there are those who would just as easily lose $500,000 as $5,000 if they had it. They fall under the category of being well capitalized but having absolutely no money management planning whatsoever.

You should consider three factors before deciding what amount to use to open an account. The first is not the margin, but the drawdown you are willing to permit with the strategy you have decided to trade. If the margin requirement for trading the bonds is $3,000 but the strategy will most likely suffer a drawdown of $5,000 through the course of trading, you're dead in the water.

The second factor that should be considered is the margin. If the drawdown will most likely be at least $5,000 and the margin is $3,000,

you know you cannot start the account for less than $8,000. Even if you were not going to consider the third factor, you would still want to give yourself some room for error in the drawdown expectation. This is explained later in this chapter in the section "Drawdowns."

The third factor to consider is the ability to continue trading after realizing the expected drawdown. What good is it to fund the account with an amount equal to the expected drawdown plus margin requirements if this renders you incapable of continuing to trade once the drawdown is realized? I personally like to triple or even quadruple the margin plus expected drawdown figure.

Quadrupling this amount does several things. First, it allows me to stay in the game should my system or trading method fail to meet my profit expectations. I can regroup, reevaluate, and continue trading what I am currently trading or change methods. Second, it gives me the psychological ability to take all the trades, even while I am in a drawdown. Although this book does not address the subject of psychology and trading, the emotional effects of suffering a number of losing trades takes its toll on the trader's ability to trade. The reason I do not deal with this subject is that I believe discussing it is a waste of time. If a trader is weak in this area (as I am) and cannot execute trades because the fear of losing causes second guessing, then the answer is to find someone to take the trades for you. Rather than spending countless hours and dollars on trying to find that event in your childhood that prevents you from taking the trades, delegate the weakness. Concentrate on the strengths and delegate the weakness. I know because it has worked for me for several years now. (That will be $185 for the counseling please.)

The third thing that is gained from quadrupling the margin plus expected drawdown is that it gives a cushion for error. If I erroneously calculated the expected drawdown to be $5,000 when it should actually be expected at $10,000, this precaution keeps me from blowing myself out of the game.

This is simply a beginning point. The same amount of capital is not required to increase the risk on any given trade. Many traders determine an amount to begin with and then conclude that the best money management approach would be to increase the amount to risk on any given trade after the account has doubled. This is a completely illogical application of a money management strategy. Some traders believe that because they approach trading very conservatively their method, as illogical as it may be, is still the only way for them. They

are wrong. Do not fall into this type of thinking. The later chapters on the Fixed Ratio method demonstrate that this is an inefficient money management strategy for the conservative and aggressive trader alike.

DRAWDOWNS

This subject is not given much attention outside the world of commodities, futures, and options. For example, you don't see the mutual fund industry boasting an 11 percent return with only a 1 percent drawdown during the year. In fact, if you have ever seen a conventional mutual fund advertise a drawdown, you have seen more than I. Nonetheless, it is a very real and important part of trading leveraged instruments. Drawdown is defined as the lowest point between two equity highs. An example of this would be an equity high occurring at 10 and then going down to 8 before coming back up and hitting 11. Between 10 and 11, the equity hit 8. This means that after hitting 10, the equity suffered a drawdown of 2.

In trading, these equity swings can range anywhere from a few thousand dollars based on trading single units to tens of thousands of dollars trading single units. Leverage is what makes these things so important to traders. When a trader begins trading an account with $20,000 and there is a possible drawdown of $20,000 with the markets and methods being traded, that trader is taking a very big gamble. Drawdowns can effectively render an account deceased.

The drawdown is equally important when considering money management principles. In the coin-flipping examples in Chapters 2 and 3, some hefty drawdowns were suffered. If not controlled, they can be detrimental. Most professionals will tell you that you cannot control drawdown. For the most part, you don't need to control drawdown. However, when the drawdown gets to a point that you may end up not being able to continue trading, you must control it by stopping it first. To paraphrase the old saying, "Do unto others before they do unto you." Before the drawdown stops you, you must stop, or seriously slow down, the drawdown first.

It is true: Drawdown is completely, 100 percent unpredictable. A trader who researched a particular method and found that such method only suffered a $5,000 drawdown in the past cannot say that this will be the maximum drawdown suffered in the future. By controlling the drawdown, we are not trying to predict it. We are simply trying to prepare for and limit it. Every trader has a certain size

drawdown that absolutely cannot be breached. To continue trading, the trader must avoid that size.

In the realm of money management, drawdown is controlled by decreasing the number of contracts you are trading as the drawdown begins to threaten the account. Applying money management techniques may propel the account to several hundred thousand dollars trading multiple contracts. However, proper money management will also protect those profits by decreasing the risk exposure of the account. This is thoroughly covered in Chapter 7. However, I mention it now to compare it with another part of trading that gets considerable attention.

THE LARGEST LOSS

The largest loss can be defined in two ways. First, it is the largest single losing trade in a particular system or method. Second, it is the largest single losing trade that *will be* suffered in a particular system or method. As a result, it can be thrown in the category of drawdowns. The largest loss cannot be predicted, even when stops are used in the market. If I am long the Deutsche mark (DM) and-have a $1,000 protective stop in on the trade, what happens when the market opens down $3,000 below where my stop was? I'll tell you what happens, I lose $4,000.

Depending on the largest losing trade size, it may or may not be devastating to an account. However, most of the time, the largest losing trade is smaller than the largest drawdown. Therefore, in comparison, the largest losing trade may do the account some damage, but it won't do near the damage that the largest drawdown will do. When you prepare for the largest drawdown, you should be adequately prepared to suffer the largest loss as well. That is how I look at the two subjects in the realm of money management. One will do more damage than the other and therefore I will prepare for that one.

5

FIXED FRACTIONAL TRADING

This chapter tells you everything you ever wanted to know about the Fixed Fractional trading method. Fixed Fractional trading is the most commonly used and recommended money management method for leveraged instruments. In fact, except for the Fixed Ratio method in this book, it very well could be the only money management method recommended in published books available today. However, most books related to trading leveraged instruments with a section or chapter on money management recommend what to use without any explanation of the possible consequences. Common arguments are made in defense of the method, but for the most part, the method has been recommended for lack of another method to replace it.

This chapter not only teaches and illustrates how the method works, but also shows the consequences of using such a method. Based on this information, it becomes apparent that traders rarely should use the Fixed Fractional method, especially individual traders with smaller accounts.

I will never forget my first speaking engagement on the subject of money management. Larry Williams had read my work on different money management techniques and was kind enough to invite me to speak at one of his Future Symposium International Seminars. Since this was my first speech on this subject, I was unsure how to present all the material in the span of only 90 minutes. I finally decided that rather than present a brief overview of *everything* I had, I should thoroughly explain the most commonly recommended method and then touch on portfolio trading as well as let the participants know that I had a much better money management method to replace the Fixed Fractional method. This was a big mistake (one of

many during my early speaking engagements on the method). I am glad to say that I had previous experience in public speaking in churches and related organizations. Had I not had this background, there would be no way I would have ever made it through that 90 minutes of pure embarrassment.

The session started out fine and most were eager to learn about a subject that most traders do not spend a great deal of time researching. I started out with the coin flip example described in Chapter 2 of this book. The crowd was in awe of the outcome, and I definitely had their attention. However, about 30 or 40 minutes into the session, a man stood up out of the blue and, for all practical purposes, shouted a sarcastic question about why I was teaching them what *not* to use. Startled by the outburst, I stumbled through the explanation that it was the most recommended method out there, and, if I was going to stand there and tell people to use the Fixed Ratio method, they would have to understand the inadequacies of the Fixed Fractional method. Well, that appeased the questioner for the time being. However, shortly after, it became clear that I was not going to teach the Fixed Ratio method. Instead, I simply displayed several printouts of hypothetical results comparing the outcome of using the Fixed Fractional method with the Fixed Ratio method.

After putting them away, I began the section on portfolios. The same person who had questioned me earlier stood up again. This time, definitely yelling, he insisted that I was trying to pawn my software product on them just as another software vendor had done the previous day. He complained that he was there to learn, not buy a software product. The funny thing about it though, is that I wasn't demonstrating *any* software product. I didn't even have a computer with me. I had simply used my Performance I printouts to compare the Fixed Fractional method with the Fixed Ratio method. So, I explained that I was not a salesperson and that if I had intended to sell my software product there, I would have been demonstrating it. It didn't matter though; another fellow joined in his argument, and all of a sudden, four or five people were standing up in the room arguing with one another, two complaining against the session and the other two or three telling them to shut up. Earlier in the session, I had asked to see a show of hands from anyone who understood what Fixed Fractional trading was. No one had raised a hand, and the few defending me pointed this out. This confrontation must have gone on for several minutes, although it seemed like forever. I can still see Larry in the back of the room trying to maintain his composure and keep

from laughing as I sweated the thing out. Finally, I took control by apologizing to those who were not happy with my presentation but stating that we still had a lot of material to cover and we were moving on. If they wanted to discuss the matter any further, they could do so after my session. After that, there were no problems.

From that experience though, I learned two things about many traders (and I hope you aren't in this group). First, if they aren't confused, they aren't happy with the material. I wanted to take the necessary time to thoroughly explain a couple of key points on money management. I thought, going into the session, that the attendees would dislike being rushed through the bulk of what I knew about money management in just 90 minutes. I was wrong. Second, that there are some plain and simple rude traders out there. They attempted to embarrass me, but only ended up embarrassing themselves. In all fairness, there is much advice in this industry that would do a better job lighting a fire in my fireplace than making my trading more profitable. All too often, however, judgments are made outside the facts or from misunderstanding the facts at hand.

This chapter teaches you what money management you should generally not use. It is extremely important for you to understand this form of money management if you are going to understand the Fixed Ratio method, which is what you should use. When I began my research, the only alternatives presented to me were variations of the Fixed Fractional method. The development of the Fixed Ratio method came directly from the problems that derive from using the Fixed Fractional method. It is a natural progression to understand the Fixed Ratio method when you have a thorough understanding of the material in this chapter.

FIXED FRACTIONAL TRADING-THE MATH

The Fixed Fractional method states that for every trade, no more than x percent of the account balance will be risked. For example, if Joe Trader has an account size of $10,000 and he is trading according to the Fixed Fractional method of 2 percent, Joe will not risk more than $200 on any given trade ($10,000 x .02 = $200). If Joe Trader is short-term trading stocks, he may be looking to buy XYZ at $10 per share and placing a protective stop at $9. Therefore, Joe would be risking $1 per share. Risking no more than 2 percent of the account on the trade, Joe will purchase 200 shares of the stock.

If Joe is trading options and the price of the option is $100, Joe will purchase 2 options. If the option price is $400, Joe cannot make the trade and follow his money management strategy because if the option were to expire worthless, Joe will have lost 4 percent on a single trade.

Futures trades are exactly the same. If the risk on any given trade is greater than $200, the trade must be passed. If the risk is exactly $200, then Joe is able to buy (or sell) one contract. If Joe decides to increase the risk he is willing to take on any given trade to 10 percent, then he could increase the number of contracts to 5 with a risk of $200 per contract.

$10,000 x .10 = $1,000

$1,000 / $200 = 5 contracts

When applying the Fixed Fractional method to futures and/or options trading, it can be stated a different way. For example, if your largest risk on the next trade equaled $1,000 and you decided not to risk more than 10 percent of an account on any given trade, the following formula will tell you what the minimum account must be to make the trade:

Largest potential loss / Percent risked on a trade

$1,000 / .10 = $10,000 minimum account balance to take trade

This is one of the more popular recommendations from industry professionals: Trade one contract for every $10,000 in your account. This is a Fixed Fractional method. The equation is simply in reverse order.

The nature of the Fixed Fractional method is interesting. First, it is not predicated on any number, sequence, or outcome of previous trades. If the largest loss in any particular trading system is $2,000 and the risk per trade is 10 percent of the account, a set of levels are generated to indicate where contracts will be increased and decreased regardless of trading statistics and sequences. The fixed fraction is based on a single trade, that being the largest loss. It does not take into account any potential drawdown that may stem from a string of several losing trades in a row.

For example, if the largest potential loss is $2,000 on any particular system or trading method, and the maximum percentage of the

account to risk on any given trade is 10 percent, then the following table is true for every increase and or decrease:

$2,000 /.10 = $20,000 minimum account balance to trade one contract

$20,000–$39,999 = 1 contract
$40,000–$59,999 = 2 contracts
$60,000–$79,999 = 3 contracts
$80,000–$99,999 = 4 contracts

And the schedule continues on one additional contract for every $20,000 in the account. If the account moves above the $40,000 level and is trading two contracts, it will decrease back to one contract if the account balance moves below $40,000. The same formula is used for any percentage and any size for the largest loss.

This is the essence of the Fixed Fractional trading method. Anyone who puts his or her head to this can understand how it works and how to apply it to trading. However, it is amazing to me how many have put their head to this method and continue to advocate it as an efficient money management method for trading leveraged instruments. The following sections demonstrate some characteristics of the method that traders should definitely be aware of before applying this method to their trading.

ONE CONTRACT FOR EVERY $10,000

As explained earlier, this simply says that you divide your account balance by $10,000 to figure out how many contracts should be traded on the following trade. If Joe Trader has $100,000 in the account, he will place 10 contracts on the next trade. This example sets up the first major problem with the Fixed Fractional method.

Suppose Joe Trader has $100,000 in the account and is trading according to the one contract for every $10,000 in the account method. If Joe's maximum risk on the next trade is $2,000 per contract, Joe's risk on the next trade is $20,000. This is not Joe's potential drawdown; this is Joe's risk on the very next trade. Apply the proper equation and this comes to a 20 percent risk on the next trade.

It doesn't take a rocket scientist to figure out that if Joe suffers two losses in a row, 36 percent of his account is at risk on just those

two trades. If Joe's positions are stopped out for three consecutive maximum losses, Joe is out 48 percent of his account. Obviously, some other factors need to be considered before blindly applying the one contract for every $10,000 in the account method.

There are times when the risk is not this high with the method. For example, if the largest loss were only $1,000, the maximum Joe would be risking on any given trade would be 10 percent, not 20 percent as with the previous example. However, should three consecutive losers occur when only risking 10 percent of the account, Joe, and any other trader for that matter, would still be risking 27 percent of the account. For those of you who can live with a drawdown of 27 percent on three consecutive losers, let's look at this method from reality.

If Joe Trader is trading one contract for every $10,000 in the account and the maximum largest losing trade is only $1,000, Joe is risking 27 percent of the account should three consecutive losers in a row occur. However, with a potential $1,000 largest losing trade, what is the total drawdown potential? Mathematically, the true drawdown potential is unlimited (see Chapter 4, section "Drawdowns"). However, based on thoroughly back testing the method being traded, it has never suffered a larger drawdown than $6,000. This drawdown does not have to occur in six consecutive trades. For example, the trade sequence may be as follows:

Trade 1 = ($1,000)	Drawdown = ($1,000)
Trade 2 = $500	Drawdown = ($500)
Trade 3 = ($1,000)	Drawdown = ($1,500)
Trade 4 = $500	Drawdown = ($1,000)
Trade 5 = ($1,000)	Drawdown = ($2,000)
Trade 6 = ($500)	Drawdown = ($2,500)
Trade 7 = ($1,000)	Drawdown = ($3,500)
Trade 8 = $500	Drawdown = ($3,000)
Trade 9 = ($1,000)	Drawdown = ($4,000)
Trade 10 = ($1,000)	Drawdown = ($5,000)
Trade 11 = ($1,000)	Drawdown = ($6,000)

According to this drawdown, if Joe were trading one contract for every $10,000 in the account with a $100,000 account, Joe's performance record is shown in the box.

Account = $100,000
Maximum potential loss on each trade = $1,000
Trade 1 = 10 contracts x ($1,000) = ($10,000) loss
Balance = $90,000
Trade 2 = 9 contracts x $500 = $4,500 gain
Balance = $94,500
Trade 3 = 9 contracts x ($1,000) = ($9,000) loss
Balance = $85,500
Trade 4 = 8 contracts x ($500) = ($4,000) loss
Balance = $81,500
Trade 5 = 8 contracts x ($1,000) = ($8,000) loss
Balance = $73,500
Trade 6 = 7 contracts x ($500) = ($3,500) loss
Balance = $70,000
Trade 7 = 7 contracts x ($1,000) = ($7,000) loss
Balance = $63,000
Trade 8 = 6 contracts x $500 = $3,000 gain
Balance = $66,000
Trade 9 = 6 contracts x ($1,000) = ($6,000) loss
Balance = $60,000
Trade 10 = 6 contracts x ($1,000) = ($6,000) loss
Balance = $54,000
Trade 11 = 5 contracts x ($1,000) = ($5,000) loss
Balance = $49,000

Therefore, with only a $6,000 drawdown trading one contract for every $10,000 in the account, Joe suffered a 51 percent shellacking! For those of you who are new to trading, if you trade on somewhat of a mediocre activity level and go an entire year without suffering a $6,000 drawdown, you are one of maybe .01 percent of all traders. That is 1/10 of 1 percent! For those of you who have been trading for years on end, you know that it is common to suffer $10,000 drawdowns. Should Joe's trading continue to suffer until it reaches a $10,000 drawdown based on a single contract, Joe will have lost 66 percent of his account, or $66,000 gone to drawdown. His account would be at $34,000 after starting with $100,000. Trading one contract for every $10,000 is not all that it is cracked up to be.

RISKING ONLY 3 PERCENT OR LESS ON EVERY TRADE

This variation of the Fixed Fractional method is often used by fund managers. However, it is also recommended for individual traders in many books as well as by many brokers. Unlike the one contract for every $10,000 variation, this offers much smaller total risks to the account should there be larger drawdowns. For example, following the same trades used in the previous example, the total drawdown after a $6,000 drawdown per contract would only bring the $100,000 account down to $93,000 risking no more than 2 percent on each trade. If the drawdown were to continue, the account would only decrease to $89,000 for a total drawdown of 11 percent.

The major problem with this variation is obviously not the risk that is involved. It is the growth factor. Apply the proper equation to this situation and you will end up with the following scenario:

$$\$1{,}000 / .02 = \$50{,}000$$

Or, trade one contract for every $50,000 in the account. According to this scenario, Joe Trader is able to trade two contracts with $100,000 in the account. However, if the first trade is a loser, it will bring the account below the $100,000 mark and drop the number of contracts to one because Joe is unable to trade fractional contracts. He can only go from one contract to two contracts and vice versa. Joe cannot trade 1.5 contracts or 1.9 contracts.

This scenario also means that if Joe starts out trading a $100,000 account, he cannot increase to three contracts until he reaches $150,000. For traders who don't have $50,000 to begin trading, this scenario is impossible as this is the minimum account balance required to trade this variation of the Fixed Fractional method. Ratchet the percentage to risk on each trade down to a more conservative 1 percent and the trader is required to have a minimum account balance of $100,000 and will not increase to two contracts until the account reaches $200,000!

$$\$1{,}000 / .01 = \$100{,}000$$

Or, instead of ratcheting the percentage down, keep it at 2 percent with a possible loss of $2,000. The trader is in the same boat as the one risking 1 percent with a maximum loss of $1,000. Before any trades can be taken, the account has to be funded with $100,000 and cannot increase to two contracts before generating another $100,000 in profits. This is why the problem with this variation of the Fixed Fractional method is with the growth factor instead of the risk factor. For all intents and purposes, there is no growth factor with this variation. For individual traders, it could be years before the money management strategy will even come into play much less affect the geometric growth of the account.

$$\$2{,}000 \;/\; .02 = \$100{,}000$$

If the small, per trade risk percentages are not suitable for the individual trader, why are they suitable for fund managers such as Commodity Trading Advisors (CTAs) and Commodity Pool Operators (CPOs)? The short answer is that they truly aren't. However, it is not nearly as apparent because of the large amount of money involved. Some funds are in the tens of millions of dollars. For example, a $20 million fund may be using the 1 percent fixed fraction to determine the number of contracts to be traded. If the largest potential loss of the next trade is $2,000 per contract, they will divide the $20 million by $200,000 and place 100 contracts on the next trade. If the trade is a loser, they still lose 1 percent of the entire capital under management. If the trade is a winner by $2,000 per contract, they increase the capital under management to $20,200,000. On the next trade, they are able to place 101 contracts. Unlike the individual traders who might wait for years before they can go from one to two contracts, the large fund managers can sometimes utilize growth in a single trade.

This is why it is not obvious that this is not the most efficient money management method for large funds. Obvious or not, rarely do large institutional funds garner consistent annual returns of more than 20 percent annually. They still suffer from the lack of geometric growth. In all fairness, most funds do not trade the entire fund the same way. Such funds use asset allocation models to divide the total capital under management into smaller portions to be traded either by other managers or other trading methods. By doing so, however, they are decreasing their ability to take advantage of the geometric growth of the fund. The smaller the amount being traded, the smaller the effect of geometric growth. It seems to be a Catch-22 situation,

but there are ways to accomplish both the small drawdowns (some funds that produce less than 20 percent annual returns generally tend to have extremely small drawdowns as well) and geometric growth in larger funds. This is covered more thoroughly in Chapter 16.

SOMEWHERE IN BETWEEN

The logical conclusion after researching the one contract for every $10,000 in the account and the extremely low percentage risks being taken on a per trade basis is that the answer lies somewhere in between. However, the logical answer is not to use any variation of Fixed Fractional trading.

According to the first example (one contract for every $10,000), the per trade risk was 20 percent. This was quickly discounted as not a viable trading option for the average trader. The percentage did go down after cutting the largest loss from $2,000 to $1,000. However, Joe's account was still slaughtered with a 51 percent loss after only a $6,000 per contract drawdown. After the drawdown went to $10,000 per contract, Joe had lost 66 percent of the account. This too is not a viable money management option for the average trader. This, coupled with the fact that risking much smaller percentages on each trade will not produce a great deal of geometric growth in an account, leaves us to try to pick a percentage somewhere between 2 percent and 10 percent.

On the following pages are spreadsheets of the same $6,000 and $10,000 drawdowns (single contract) being suffered on a $100,000 account risking from 3 percent to 9 percent on each trade. I have also included the spreadsheets for both a $1,000 largest losing potential trade and a $2,000 largest potential losing trade.

These spreadsheets show the largest loss, the fixed fractional percentage used, followed by the required additional equity needed to increase an additional contract. With Fixed Fractional trading, the first three columns will always remain the same. Column 4 shows the number of contracts that will be traded after the required additional equity is achieved. Column 5 shows what each contract must produce to achieve the required equity. This column will always decrease in size as more contracts are traded. This is calculated by simply dividing the required additional equity by the number of contracts column. Therefore, when trading two contracts, each contract has to produce only $16,667 in profits (total of $33,333) to increase to three contracts (Table 5.1).

TABLE 5.1 $1,000 Loss Risking 3%

Large Loss	% Risk	Req. Equity	# Contracts	Per Contract Req	1 Contract Accum	Net Result
$1,000	3	$33,333	1	$33,333	$ 33,333	$ 33,333
1,000	3	33,333	2	16,667	50,000	66,667
1,000	3	33,333	3	11,111	61,111	100,000
1,000	3	33,333	4	8,333	69,444	133,333
1,000	3	33,333	5	6,667	76,111	166,667
1,000	3	33,333	6	5,556	81,667	200,000
1,000	3	33,333	7	4,762	86,429	233,333
1,000	3	33,333	8	4,167	90,595	266,667
1,000	3	33,333	9	3,704	94,299	300,000
1,000	3	33,333	10	3,333	97,632	333,333
1,000	3	33,333	11	3,030	100,663	366,667
1,000	3	33,333	12	2,778	103,440	400,000
1,000	3	33,333	13	2,564	106,004	433,333
1,000	3	33,333	14	2,381	108,385	466,667
1,000	3	33,333	15	2,222	110,608	500,000
1,000	3	33,333	16	2,083	112,691	533,333
1,000	3	33,333	17	1,961	114,652	566,667
1,000	3	33,333	18	1,852	116,504	600,000
1,000	3	33,333	19	1,754	118,258	633,333
1,000	3	33,333	20	1,667	119,925	666,667
1,000	3	33,333	21	1,587	121,512	700,000
1,000	3	33,333	22	1,515	123,027	733,333
1,000	3	33,333	23	1,449	124,476	766,667
1,000	3	33,333	24	1,389	125,865	800,000
1,000	3	33,333	25	1,333	127,199	833,333
1,000	3	33,333	26	1,282	128,481	866,667
1,000	3	33,333	27	1,235	129,715	900,000
1,000	3	33,333	28	1,190	130,906	933,333
1,000	3	33,333	29	1,149	132,055	966,667
1,000	3	33,333	30	1,111	133,166	1,000,000
1,000	3	33,333	31	1,075	134,242	1,033,333
1,000	3	33,333	32	1,042	135,283	1,066,667
1,000	3	33,333	33	1,010	136,293	1,100,000
1,000	3	33,333	34	980	137,274	1,133,333
1,000	3	33,333	35	952	138,226	1,166,667
1,000	3	33,333	36	926	139,152	1,200,000
1,000	3	33,333	37	901	140,053	1,233,333
1,000	3	33,333	38	877	140,930	1,266,667
1,000	3	33,333	39	855	141,785	1,300,000
1,000	3	33,333	40	833	142,618	1,333,333
1,000	3	33,333	41	813	143,431	1,366,667

TABLE 5.1 (Continued)

Large Loss	% Risk	Req. Equity	# Contracts	Per Contract Req	1 Contract Accum	Net Result
1,000	3	33,333	42	794	144,225	1,400,000
1,000	3	33,333	43	775	145,000	1,433,333
1,000	3	33,333	44	758	145,758	1,466,667
1,000	3	33,333	45	741	146,498	1,500,000
1,000	3	33,333	46	725	147,223	1,533,333
1,000	3	33,333	47	709	147,932	1,566,667
1,000	3	33,333	48	694	148,627	1,600,000
1,000	3	33,333	49	680	149,307	1,633,333
1,000	3	33,333	50	667	149,974	1,666,667
1,000	3	33,333	51	654	150,627	1,700,000
1,000	3	33,333	52	641	151,268	1,733,333
1,000	3	33,333	53	629	151,897	1,766,667
1,000	3	33,333	54	617	152,514	1,800,000
1,000	3	33,333	55	606	153,120	1,833,333

Column 6 is the performance based on trading a single unit. In other words, it is the sum of the fifth column. Column 7 is the money management being applied to column 6. Therefore, column 6 is what is required based on trading a single unit to produce the profits with that particular fixed fraction in column 7.

As shown in Table 5.1, it would take $100,000 in profits trading a single unit to produce $366,000 by applying the 3 percent Fixed Fractional method. However, it will take only $21,000 more based on trading a single unit to produce the next $350,000 with the 3 percent Fixed Fractional method.

Table 5.2 is a bit more aggressive, however, it still takes over $81,000 in profits based on trading a single unit to produce $350,000 in profits with the fixed fractional method. It does achieve almost $1 million in profits after about $106,000 based on a single unit, but the last $650,000 of that was dependent on only $26,000 while the first $350,000 required over $80,000.

Table 5.3 requires almost $130,000 before reaching $350,000 with the money management and an additional $50,000 after that to make it to $1 million.

Table 5.4 requires close to $70,000 the first leg and an additional $20,000 to make it to $1 million. Now the method is making it to $1

TABLE 5.2 $1,000 Loss Risking 4%

Large Loss	% Risk	Req. Equity	# Contracts	Per Contract Req	1 Contract Accum	Net Result
$1,000	4	$25,000	1	$25,000	$ 25,000	$ 25,000
1,000	4	25,000	2	12,500	37,500	50,000
1,000	4	25,000	3	8,333	45,833	75,000
1,000	4	25,000	4	6,250	52,083	100,000
1,000	4	25,000	5	5,000	57,083	125,000
1,000	4	25,000	6	4,167	61,250	150,000
1,000	4	25,000	7	3,571	64,821	175,000
1,000	4	25,000	8	3,125	67,946	200,000
1,000	4	25,000	9	2,778	70,724	225,000
1,000	4	25,000	10	2,500	73,224	250,000
1,000	4	25,000	11	2,273	75,497	275,000
1,000	4	25,000	12	2,083	77,580	300,000
1,000	4	25,000	13	1,923	79,503	325,000
1,000	4	25,000	14	1,786	81,289	350,000
1,000	4	25,000	15	1,667	82,956	375,000
1,000	4	25,000	16	1,563	84,518	400,000
1,000	4	25,000	17	1,471	85,989	425,000
1,000	4	25,000	18	1,389	87,378	450,000
1,000	4	25,000	19	1,316	88,693	475,000
1,000	4	25,000	20	1,250	89,943	500,000
1,000	4	25,000	21	1,190	91,134	525,000
1,000	4	25,000	22	1,136	92,270	550,000
1,000	4	25,000	23	1,087	93,357	575,000
1,000	4	25,000	24	1,042	94,399	600,000
1,000	4	25,000	25	1,000	95,399	625,000
1,000	4	25,000	26	962	96,360	650,000
1,000	4	25,000	27	926	97,286	675,000
1,000	4	25,000	28	893	98,179	700,000
1,000	4	25,000	29	862	99,041	725,000
1,000	4	25,000	30	833	99,875	750,000
1,000	4	25,000	31	806	100,681	775,000
1,000	4	25,000	32	781	101,462	800,000
1,000	4	25,000	33	758	102,220	825,000
1,000	4	25,000	34	735	102,955	850,000
1,000	4	25,000	35	714	103,670	875,000
1,000	4	25,000	36	694	104,364	900,000
1,000	4	25,000	37	676	105,040	925,000
1,000	4	25,000	38	658	105,698	950,000
1,000	4	25,000	39	641	106,339	975,000
1,000	4	25,000	40	625	106,964	1,000,000
1,000	4	25,000	41	610	107,573	1,025,000

TABLE 5.2 (Continued)

Large Loss	% Risk	Req. Equity	# Contracts	Per Contract Req	1 Contract Accum	Net Result
1,000	4	25,000	42	**595**	108,169	1,050,000
1,000	4	25,000	43	581	108,750	1,075,000
1,000	4	25,000	44	568	109,318	1,100,000
1,000	4	25,000	45	556	109,874	1,125,000
1,000	4	25,000	46	543	**110,417**	1,150,000
1,000	4	25,000	47	532	110,949	1,175,000
1,000	4	25,000	48	521	111,470	1,200,000
1,000	4	25,000	49	510	111,980	1,225,000
1,000	4	25,000	50	500	112,480	1,250,000
1,000	4	25,000	51	490	112,970	1,275,000
1,000	4	25,000	52	481	113,451	1,300,000
1,000	4	25,000	53	472	113,923	1,325,000
1,000	4	25,000	54	463	114,386	1,350,000
1,000	4	25,000	55	455	114,840	1,375,000

TABLE 5.3 $2,000 Loss Risking 4%

Large Loss	% Risk	Req. Equity	# Contracts	Per Contract Req	1 Contract Accum	Net Result
$2,000	4	$50,000	1	$50,000	$ 50,000	$ 50,000
2,000	4	50,000	2	25,000	75,000	100,000
2,000	4	50,000	3	16,667	91,667	150,000
2,000	4	50,000	4	12,500	104,167	200,000
2,000	4	50,000	5	10,000	114,167	250,000
2,000	4	50,000	6	8,333	122,500	300,000
2,000	4	50,000	7	7,143	129,643	350,000
2,000	4	50,000	8	6,250	135,893	400,000
2,000	4	50,000	9	5,556	141,448	450,000
2,000	4	50,000	10	5,000	146,448	500,000
2,000	4	50,000	11	4,545	150,994	550,000
2,000	4	50,000	12	4,167	155,161	600,000
2,000	4	50,000	13	3,846	159,007	650,000
2.000	4	50,000	14	3,571	162,578	700,000

(Continued)

TABLE 5.3 (Continued)

Large Loss	% Risk	Req. Equity	# Contracts	Per Contract 1 Contract Req	Accum	Net Result
2,000	4	50,000	15	3,333	165,911	750,000
2,000	4	50,000	16	3,125	169,036	800,000
2,000	4	50,000	17	2,941	171,978	850,000
2,000	4	50,000	18	2,778	174,755	900,000
2,000	4	50,000	19	2,632	177,387	950,000
2,000	4	50,000	20	2,500	179,887	1,000,000
2,000	4	50,000	21	2,381	182,268	1,050,000
2,000	4	50,000	22	2,273	184,541	1,100,000
2,000	4	50,000	23	2,174	186,715	1,150,000
2,000	4	50,000	24	2,083	188,798	1,200,000
2,000	4	50,000	25	2,000	190,798	1,250,000
2,000	4	50,000	26	1,923	192,721	1,300,000
2,000	4	50,000	27	1,852	194,573	1,350,000
2,000	4	50,000	28	1,786	196,359	1,400,000
2,000	4	50,000	29	1,724	198,083	1,450,000
2,000	4	50,000	30	1,667	199,749	1,500,000
2,000	4	50,000	31	1,613	201,362	1,550,000
2,000	4	50,000	32	1,563	202,925	1,600,000
2,000	4	50,000	33	1,515	204,440	1,650,000
2,000	4	50,000	34	1,471	205,910	1,700,000
2,000	4	50,000	35	1,429	207,339	1,750,000
2,000	4	50,000	36	1,389	208,728	1,800,000
2,000	4	50,000	37	1,351	210,079	1,850,000
2,000	4	50,000	38	1,316	211,395	1,900,000
2,000	4	50,000	39	1,282	212,677	1,950,000
2,000	4	50,000	40	1,250	213,927	2,000,000
2,000	4	50,000	41	1,220	215,147	2,050,000
2,000	4	50,000	42	1,190	216,337	2,100,000
2,000	4	50,000	43	1,163	217,500	2,150,000
2,000	4	50,000	44	1,136	218,636	2,200,000
2,000	4	50,000	45	1,111	219,747	2,250,000
2,000	4	50,000	46	1,087	220,834	2,300,000
2,000	4	50,000	47	1,064	221,898	2,350,000
2,000	4	50,000	48	1,042	222,940	2,400,000
2,000	4	50,000	49	1,020	223,960	2,450,000
2,000	4	50,000	50	1,000	224,960	2,500,000
2,000	4	50,000	51	980	225,941	2,550,000
2,000	4	50,000	52	962	226,902	2,600,000
2,000	4	50,000	53	943	227,846	2,650,000
2,000	4	50,000	54	926	228,772	2,700,000
2,000	4	50,000	55	909	229,681	2,750,000

TABLE 5.4 $1,000 Loss Risking 5%

Large Loss	% Risk	Req. Equity	# Contracts	Per Contract 1 Contract Rea	Accum	Net Result
$1,000	5	$20,000	1	$20,000	$20,000	$ 20,000
1,000	5	20,000	2	10,000	30,000	40,000
1,000	5	20,000	3	6,667	36,667	60,000
1,000	5	20,000	4	5,000	41,667	80,000
1,000	5	20,000	5	4,000	45,667	100,000
1,000	5	20,000	6	3,333	49,000	120,000
1,000	5	20,000	7	2,857	51,857	140,000
1,000	5	20,000	8	2,500	54,357	160,000
1,000	5	20,000	9	2,222	56,579	180,000
1,000	5	20,000	10	2,000	58,579	200,000
1,000	5	20,000	11	1,818	60,398	220,000
1,000	5	20,000	12	1,667	62,064	240,000
1,000	5	20,000	13	1,538	63,603	260,000
1,000	5	20,000	14	1,429	65,031	280,000
1,000	5	20,000	15	1,333	66,365	300,000
1,000	5	20,000	16	1,250	67,615	320,000
1,000	5	20,000	17	1,176	68,791	340,000
1,000	5	20,000	18	1,111	69,902	360,000
1,000	5	20,000	19	1,053	70,955	380,000
1,000	5	20,000	20	1,000	71,955	400,000
1,000	5	20,000	21	952	72,907	420,000
1,000	5	20,000	22	909	73,816	440,000
1,000	5	20,000	23	870	74,686	460,000
1,000	5	20,000	24	833	75,519	480,000
1,000	5	20,000	25	800	76,319	500,000
1,000	5	20,000	26	769	77,088	520,000
1,000	5	20,000	27	741	77,829	540,000
1,000	5	20,000	28	714	78,543	560,000
1,000	5	20,000	29	690	79,233	580,000
1,000	5	20,000	30	667	79,900	600,000
1,000	5	20,000	31	645	80,545	620,000
1,000	5	20,000	32	625	81,170	640,000
1,000	5	20,000	33	606	81,776	660,000
1,000	5	20,000	34	588	82,364	680,000
1,000	5	20,000	35	571	82,936	700,000
1,000	5	20,000	36	556	83,491	720,000
1,000	5	20,000	37	541	84,032	740,000
1,000	5	20,000	38	526	84,558	760,000
1,000	5	20,000	39	513	85,071	780,000

(Continued)

TABLE 5.4 (Continued)

Large Loss	% Risk	Req. Equity	# Contracts	Per Contract 1 Contract Req	Accum	Net Result
1,000	5	20,000	40	500	85,571	800,000
1,000	5	20,000	41	488	86,059	820,000
1,000	5	20,000	42	476	86,535	840,000
1,000	5	20,000	43	465	87,000	860,000
1,000	5	20,000	44	455	87,455	880,000
1,000	5	20,000	45	444	87,899	900,000
1,000	5	20,000	46	435	88,334	920,000
1,000	5	20,000	47	426	88,759	940,000
1,000	5	20,000	48	417	89,176	960,000
1,000	5	20,000	49	408	89,584	980,000
1,000	5	20,000	50	400	89,984	1,000,000
1,000	5	20,000	51	392	90,376	1,020,000
1,000	5	20,000	52	385	90,761	1,040,000
1,000	5	20,000	53	377	91,138	1,060,000
1,000	5	20,000	54	370	91,509	1,080,000
1,000	5	20,000	55	364	91,872	1,100,000

million in less than the $100,000 required in the 5-year breakdown in Chapter 2 using a conservative Fixed Ratio method.

Table 5.5 jumps up to $113,000 to achieve the $350,000 with the money management, while the $1 million takes less than $40,000 additional profits.

Table 5.6 requires $60,000 and an additional $18,000. It is here that things begin to change with the risks being taken. Notice that there are 55 contracts being traded with the account only at $916,000. With one largest losing trade, the account drops $55,000 (6%). A $5,000 drawdown here drops the profit level to only $674,000 trading 40 contracts. This is a 26 percent drawdown coming from just a $5,000 drawdown based on one contract. Things begin to get a little wilder from this point on.

Table 5.7 happens to be the exact same sequence as Table 5.1 because both calculate into 1 contract for every $33,333 in the account.

Table 5.8 requires $54,000 to reach $350,000 with money management. Extending the spreadsheet down to $1 million would have the number of contracts at 70 and only needs another $15,000 per contract to get there. At 70 contracts, it takes only one win of $204 to

TABLE 5.5 $2,000 Loss Risking 5%

Large Loss	% Risk	Req. Equity	# Contracts	Per Contract 1 Contract Req	Accum	Net Result
$2,000	5	$40,000	1	$40,000	$ 40,000	$ 40,000
2,000	5	40,000	2	20,000	60,000	80,000
2,000	5	40,000	3	13,333	73,333	120,000
2,000	5	40,000	4	10,000	83,333	160,000
2,000	5	40,000	5	8,000	91,333	200,000
2,000	5	40,000	6	6,667	98,000	240,000
2,000	5	40,000	7	5,714	103,714	280,000
2,000	5	40,000	8	5,000	108,714	320,000
2,000	5	40,000	9	4,444	113,159	360,000
2,000	5	40,000	10	4,000	117,159	400,000
2,000	5	40,000	11	3,636	120,795	440,000
2,000	5	40,000	12	3,333	124,128	480,000
2,000	5	40,000	13	3,077	127,205	520,000
2,000	5	40,000	14	2,857	130,062	560,000
2,000	5	40,000	15	2,667	132,729	600,000
2,000	5	40,000	16	2,500	135,229	640,000
2,000	5	40,000	17	2,353	137,582	680,000
2,000	5	40,000	18	2,222	139,804	720,000
2,000	5	40,000	19	2,105	141,910	760,000
2,000	5	40,000	20	2,000	143,910	800,000
2,000	5	40,000	21	1,905	145,814	840,000
2,000	5	40,000	22	1,818	147,633	880,000
2,000	5	40,000	23	1,739	149,372	920,000
2,000	5	40,000	24	1,667	151,038	960,000
2,000	5	40,000	25	1,600	152,638	1,000,000
2,000	5	40,000	26	1,538	154,177	1,040,000
2,000	5	40,000	27	1,481	155,658	1,080,000
2,000	5	40,000	28	1,429	157,087	1,120,000
2,000	5	40,000	29	1,379	158,466	1,160,000
2,000	5	40,000	30	1,333	159,799	1,200,000
2,000	5	40,000	31	1,290	161,090	1,240,000
2,000	5	40,000	32	1,250	162,340	1,280,000
2,000	5	40,000	33	1,212	163,552	1,320,000
2,000	5	40,000	34	1,176	164,728	1,360,000
2,000	5	40,000	35	1,143	165,871	1,400,000
2,000	5	40,000	36	1,111	166,982	1,440,000
2,000	5	40,000	37	1,081	168,063	1,480,000
2,000	5	40,000	38	1,053	169,116	1,520,000
2,000	5	40,000	39	1,026	170,142	1,560,000

(Continued)

TABLE 5.5 (Continued)

Large Loss	% Risk	Req. Equity	# Contracts	Per Contract 1 Req	Contract Accum	Net Result
2,000	5	40,000	40	1,000	171,142	1,600,000
2,000	5	40,000	41	976	172,117	1,640,000
2,000	5	40,000	42	952	173,070	1,680,000
2,000	5	40,000	43	930	174,000	1,720,000
2,000	5	40,000	44	909	174,909	1,760,000
2,000	5	40,000	45	889	175,798	1,800,000
2,000	5	40,000	46	870	176,667	1,840,000
2,000	5	40,000	47	851	177,519	1,880,000
2,000	5	40,000	48	833	178,352	1,920,000
2,000	5	40,000	49	816	179,168	1,960,000
2,000	5	40,000	50	800	179,968	2,000,000
2,000	5	40,000	51	784	180,753	2,040,000
2,000	5	40,000	52	769	181,522	2,080,000
2,000	5	40,000	53	755	182,276	2,120,000
2,000	5	40,000	54	741	183,017	2,160,000
2,000	5	40,000	55	727	183,744	2,200,000

TABLE 5.6 $1,000 Loss Risking 6%

Large Loss	% Risk	Req. Equity	# Contracts	Per Contract 1 Req	Contract Accum	Net Result
$1,000	6	$16,667	1	$16,667	$16,667	$ 16,667
1,000	6	16,667	2	8,333	25,000	33,333
1,000	6	16,667	3	5,556	30,556	50,000
1,000	6	16,667	4	4,167	34,722	66,667
1,000	6	16,667	5	3,333	38,056	83,333
1,000	6	16,667	6	2,778	40,833	100,000
1,000	6	16,667	7	2,381	43,214	116,667
1,000	6	16,667	8	2,083	45,298	133,333
1,000	6	16,667	9	1,852	47,149	150,000
1,000	6	16,667	10	1,667	48,816	166,667
1,000	6	16,667	11	1,515	50,331	183,333
1,000	6	16,667	12	1,389	51,720	200,000
1,000	6	16,667	13	1,282	53,002	216,667
1,000	6	16,667	14	1,190	54,193	233,333

TABLE 5.6 (Continued)

Large Loss	% Risk	Req. Equity	# Contracts	Per Contract 1 Req	Contract Accum	Net Result
1,000	6	16,667	15	1,111	55,304	250,000
1,000	6	16,667	16	1,042	56,345	266,667
1,000	6	16,667	17	980	57,326	283,333
1,000	6	16,667	18	926	58,252	300,000
1,000	6	16,667	19	877	59,129	316,667
1,000	6	16,667	20	833	59,962	333,333
1,000	6	16,667	21	794	60,756	350,000
1,000	6	16,667	22	758	61,514	366,667
1,000	6	16,667	23	725	62,238	383,333
1,000	6	16,667	24	694	62,933	400,000
1,000	6	16,667	25	667	63,599	416,667
1,000	6	16,667	26	641	64,240	433,333
1,000	6	16,667	27	617	64,858	450,000
1,000	6	16,667	28	595	65,453	466,667
1,000	6	16,667	29	575	66,028	483,333
1,000	6	16,667	30	556	66,583	500,000
1,000	6	16,667	31	538	67,121	516,667
1,000	6	16,667	32	521	67,642	533,333
1,000	6	16,667	33	505	68,147	550,000
1,000	6	16,667	34	490	68,637	566,667
1,000	6	16,667	35	476	69,113	583,333
1,000	6	16,667	36	463	69,576	600,000
1,000	6	16,667	37	450	70,026	616,667
1,000	6	16,667	38	439	70,465	633,333
1,000	6	16,667	39	427	70,582	650,000
1,000	6	16,667	40	417	71,309	666,667
1,000	6	16,667	41	407	71,716	683,333
1,000	6	16,667	42	397	72,112	700,000
1,000	6	16,667	43	388	72,500	716,667
1,000	6	16,667	44	379	72,879	733,333
1,000	6	16,667	45	370	73,249	750,000
1,000	6	16,667	46	362	73,611	766,667
1,000	6	16,667	47	355	73,966	783,333
1,000	6	16,667	48	347	74,313	800,000
1,000	6	16,667	49	340	74,653	816,667
1,000	6	16,667	50	333	74,987	833,333
1,000	6	16,667	51	327	75,314	850,000
1,000	6	16,667	52	321	75,634	866,667
1,000	6	16,667	53	314	75,949	883,333
1,000	6	16,667	54	309	76,257	900,000
1,000	6	16,667	55	303	76,560	916,667

TABLE 5.7 $2,000 Loss Risking 6%

Large Loss	% Risk	Req. Equity	# Contracts	Per Contract 1 Req	Contract Accum	Net Result
$2,000	6	$33,333	1	$33,333	$ 33,333	$ 33,333
2,000	6	33,333	2	16,667	50,000	66,667
2,000	6	33,333	3	11,111	61,111	100,000
2,000	6	33,333	4	8,333	69,444	133,333
2,000	6	33,333	5	6,667	76,111	166,667
2,000	6	33,333	6	5,556	81,667	200,000
2,000	6	33,333	7	4,762	86,429	233,333
2,000	6	33,333	8	4,167	90,595	266,667
2,000	6	33,333	9	3,704	94,299	300,000
2,000	6	33,333	10	3,333	97,632	333,333
2,000	6	33,333	11	3,030	100,663	366,667
2,000	6	33,333	12	2,778	103,440	400,000
2,000	6	33,333	13	2,564	106,004	433,333
2,000	6	33,333	14	2,381	108,385	466,667
2,000	6	33,333	15	2,222	110,608	500,000
2,000	6	33,333	16	2,083	112,691	533,333
2,000	6	33,333	17	1,961	114,652	566,667
2,000	6	33,333	18	1,852	116,504	600,000
2,000	6	33,333	19	1,754	118,258	633,333
2,000	6	33,333	20	1,667	119,925	666,667
2,000	6	33,333	21	1,587	121,512	700,000
2,000	6	33,333	22	1,515	123,027	733,333
2,000	6	33,333	23	1,449	124,476	766,667
2,000	6	33,333	24	1,389	125,865	800,000
2,000	6	33,333	25	1,333	127,199	833,333
2,000	6	33,333	26	1,282	128,481	866,667
2,000	6	33,333	27	1,235	129,715	900,000
2,000	6	33,333	28	1,190	130,906	933,333
2,000	6	33,333	29	1,149	132,055	966,667
2,000	6	33,333	30	1,111	133,166	1,000,000
2,000	6	33,333	31	1,075	134,242	1,033,333
2,000	6	33,333	32	1,042	135,283	1,066,667
2,000	6	33,333	33	1,010	136,293	1,100,000
2,000	6	33,333	34	980	137,274	1,133,333
2,000	6	33,333	35	952	138,226	1,166,667
2,000	6	33,333	36	926	139,152	1,200,000
2,000	6	33,333	37	901	140,053	1,233,333
2,000	6	33,333	38	877	140,930	1,266,667
2,000	6	33,333	39	855	141,785	1,300,000
2,000	6	33,333	40	833	142,618	1,333,333
2,000	6	33,333	41	813	143,431	1,366,667

TABLE 5.7 (Continued)

Large Loss	% Risk	Req. Equity	# Contracts	Per Contract 1 Req	Contract Accum	Net Result
2,000	6	33,333	42	794	144,225	1,400,000
2,000	6	33,333	43	775	145,000	1,433,333
2,000	6	33,333	44	758	145,758	1,466,667
2,000	6	33,333	45	741	146,498	1,500,000
2,000	6	33,333	46	725	147,223	1,533,333
2,000	6	33,333	47	709	147,932	1,566,667
2,000	6	33,333	48	694	148,627	1,600,000
2,000	6	33,333	49	680	149,307	1,633,333
2,000	6	33,333	50	667	149,974	1,666,667
2,000	6	33,333	51	654	150,627	1,700,000
2,000	6	33,333	52	641	151,268	1,733,333
2,000	6	33,333	53	629	151,897	1,766,667
2,000	6	33,333	54	617	152,514	1,800,000
2,000	6	33,333	55	606	153,120	1,833,333

TABLE 5.8 $1,000 Loss Risking 7%

Large Loss	% Risk	Req. Equity	# Contracts	Per Contract 1 Req	Contract Accum	Net Result
$1,000	7	$14,286	1	$14,286	$14,286	$ 14,286
1,000	7	14,286	2	7,143	21,429	28,571
1,000	7	14,286	3	4,762	26,190	42,857
1,000	7	14,286	4	3,571	29,762	57,143
1,000	7	14,286	5	2,857	32,619	71,429
1,000	7	14,286	6	2,381	35,000	85,714
1,000	7	14,286	7	2,041	37,041	100,000
1,000	7	14,286	8	1,786	38,827	114,286
1,000	7	14,286	9	1,587	40,414	128,571
1,000	7	14,286	10	1,429	41,842	142,857
1,000	7	14,286	11	1,299	43,141	157,143
1,000	7	14,286	12	1,190	44,332	171,429
1,000	7	14,286	13	1,099	45,430	185,714
1,000	7	14,286	14	1,020	46,451	200,000

(Continued)

TABLE 5.8 (Continued)

Large Loss	% Risk	Req. Equity	# Contracts	Per Contract 1 Contract Req	Contract Accum	Net Result
1,000	7	14,286	15	**952**	47,403	214,286
1,000	7	14,286	16	**893**	48,296	228,571
1,000	7	14,286	17	840	49,136	242,857
1,000	7	14,286	18	794	49,930	257,143
1,000	7	14,286	19	752	50,682	271,429
1,000	7	14,286	20	714	51,396	285,714
1,000	7	14,286	21	680	52,077	300,000
1,000	7	14,286	22	649	52,726	314,286
1,000	7	14,286	23	621	53,347	328,571
1,000	7	14,286	24	595	53,942	342,857
1,000	7	14,286	25	571	54,514	357,143
1,000	7	14,286	26	549	55,063	371,429
1,000	7	14,286	27	529	55,592	385,714
1,000	7	14,286	28	510	56,102	400,000
1,000	7	14,286	29	493	56,595	414,286
1,000	7	14,286	30	476	57,071	428,571
1,000	7	14,286	31	461	57,532	442,857
1,000	7	14,286	32	446	57,979	457,143
1,000	7	14,286	33	433	58,411	471,429
1,000	7	14,286	34	420	58,832	485,714
1,000	7	14,286	35	408	59,240	500,000
1,000	7	14,286	36	397	59,637	514,286
1,000	7	14,286	37	386	60,023	528,571
1,000	7	14,286	38	376	60,399	542,857
1,000	7	14,286	39	366	60,765	557,143
1,000	7	14,286	40	357	61,122	571,429
1,000	7	14,286	41	348	61,470	585,714
1,000	7	14,286	42	340	61,811	600,000
1,000	7	14,286	43	332	62,143	614,286
1,000	7	14,286	44	325	62,468	628,571
1,000	7	14,286	45	317	62,785	642,857
1,000	7	14,286	46	311	63,096	657,143
1,000	7	14,286	47	304	63,399	971,429
1,000	7	14,286	48	298	63,697	685,714
1,000	7	14,286	49	292	63,989	700,000
1,000	7	14,286	50	286	64,274	714,286
1,000	7	14,286	51	280	64,554	728,571
1,000	7	14,286	52	275	64,829	742,857
1,000	7	14,286	53	270	65,099	757,143
1,000	7	14,286	54	265	65,363	771,429
1,000	7	14,286	55	260	65,623	785,714

TABLE 5.9 $2,000 Loss Risking 7%

Large Loss	% Risk	Req. Equity	# Contracts	Per Contract 1 Contract Req	Contract Accum	Net Result
$2,000	7	$28,571	1	$28,571	**$ 28,571**	$ 28,571
2,000	7	28,571	2	14,286	42,857	57,143
2,000	7	28,571	3	9,524	52,381	85,714
2,000	7	28,571	4	7,143	59,524	114,286
2,000	7	28,571	5	5,714	65,238	142,857
2,000	7	28,571	6	4,762	70,000	171,429
2,000	7	28,571	7	4,082	74,082	200,000
2,000	7	28,571	8	3,571	77,653	228,571
2,000	7	28,571	9	3,175	80,828	257,143
2,000	7	28,571	10	2,857	83,685	285,714
2,000	7	28,571	11	2,597	86,282	314,286
2,000	7	28,571	12	2,381	88,663	342,857
2,000	7	28,571	13	2,198	90,861	371,429
2,000	7	28,571	14	2,041	92,902	400,000
2,000	7	28,571	15	1,905	94,807	428,571
2,000	7	28,571	16	1,786	96,592	457,143
2,000	7	28,571	17	1,681	98,273	485,714
2,000	7	28,571	18	1,587	99.860	514,286
2,000	7	28,571	19	1,504	101,364	542,857
2,000	7	28,571	20	1,429	102,793	571,429
2,000	7	28,571	21	1,361	104,153	600,000
2,000	7	28,571	22	1,299	105,452	628,571
2,000	7	28,571	23	1,242	106,694	657,143
2,000	7	28,571	24	1,190	107,885	685,714
2,000	7	28,571	25	1,143	109,027	714,286
2,000	7	28,571	26	1,099	110,126	742,857
2,000	7	28,571	27	1,058	111,184	771,429
2,000	7	28,571	28	1,020	112,205	800,000
2,000	7	28,571	29	985	113,190	828,571
2,000	7	28,571	30	952	114,142	857,143
2,000	7	28,571	31	922	115,064	885,714
2,000	7	28,571	32	893	115,957	914,286
2,000	7	28,571	33	866	116,823	942,857
2,000	7	28,571	34	840	117,663	971,429
2,000	7	28,571	35	816	118,479	1,000,000
2,000	7	28,571	36	794	119,273	1,028,571
2,000	7	28,571	37	772	120,045	1,057,143
2,000	7	28,571	38	752	120,797	1,085,714
2,000	7	28,571	39	733	121,530	1,114,286
2,000	7	28,571	40	714	122,244	1,142,857

(Continued)

TABLE 5.9 (Continued)

Large Loss	% Risk	Req. Equity	# Contracts	Pdr Contract 1 Contract Req	Accum	Net Result
2,000	7	28,571	40	714	122,244	1,142,857
2,000	7	28,571	41	697	122,941	1,171,429
2,000	7	28,571	42	680	123,621	1,200,000
2,000	7	28,571	43	664	124,286	1,228,571
2,000	7	28,571	44	649	124,935	1,257,143
2,000	7	28,571	45	635	125,570	1,285,714
2,000	7	28,571	46	621	126,191	1,314,286
2,000	7	28,571	47	608	126,799	1,342,857
2,000	7	28,571	48	595	127,394	1,371,429
2,000	7	28,571	49	583	127,977	1,400,000
2,000	7	28,571	50	571	128,549	1,428,571
2,000	7	28,571	51	560	129,109	1,457,143
2,000	7	28,571	52	549	129,658	1,485,714
2,000	7	28,571	53	539	130,197	1,514,286
2,000	7	28,571	54	529	130,727	1,542,857
2,000	7	28,571	55	519	131,246	1,571,429

increase to 71 contracts. Looking at the top of the spreadsheet, it took $14,286 to go from trading one contract to two.

Table 5.9 requires close to $90,000 to reach $350,000 with money management and an additional $30,000 based on a single contract to reach $1 million with the money management. Remember that this is with a largest loss of only $2,000.

Table 5.10 requires only $49,000 and extending the chart to $1 million in profits with the money management needs only an additional $13,000. By the time that is reached, 80 contracts are being traded.

Table 5.11 requires $81,000 in single contract profits to reach $350,000 in profits after money management is applied. An additional $25,000 in single contract profits is required to increase total money management profits to $1,000,000. Forty contracts are being traded at this level.

Table 5.12 is trading 90 contracts at $1 million. This calculates out to 1 contract for every $11,111 in the account. Risking only 9 percent on each trade results in a drawdown of 37.4 percent of the profits. A $10,000 drawdown brings that to a 61 percent drawdown.

TABLE 5.10 $1,000 Loss Risking 8%

Large Loss	% Risk	Req. Equity	# Contracts	Per Contract 1 Contract Req	Accum	Net Result
$1,000	8	$12,500	1	$12,500	$12,500	$ 12,500
1,000	8	12,500	2	6,250	18,750	25,000
1,000	8	12,500	3	4,167	22,917	37,500
1,000	8	12,500	4	3,125	26,042	50,000
1,000	8	12,500	5	2,500	28,542	62,500
1,000	8	12,500	6	2,083	30,625	75,000
1,000	8	12,500	7	1,786	32,411	87,500
1,000	8	12,500	8	1,563	33,973	100,000
1,000	8	12,500	9	1,389	35,362	112,500
1,000	8	12,500	10	1,250	36,612	125,000
1,000	8	12,500	11	1,136	37,748	137,500
1,000	8	12,500	12	1,042	38,790	150,000
1,000	8	12,500	13	962	39,752	162,500
1,000	8	12,500	14	893	40,645	175,000
1,000	8	12,500	15	833	41,478	187,500
1,000	8	12,500	16	781	42,259	200,000
1,000	8	12,500	17	735	42,994	212,500
1,000	8	12,500	18	694	43,689	225,000
1,000	8	12,500	19	658	44,347	237,500
1,000	8	12,500	20	625	44,972	250,000
1,000	8	12,500	21	595	45,567	262,500
1,000	8	12,500	22	568	46,135	275,000
1,000	8	12,500	23	543	46,679	287,500
1,000	8	12,500	24	521	47,199	300,000
1,000	8	12,500	25	500	47,699	312,500
1,000	8	12,500	26	481	48,180	325,000
1,000	8	12,500	27	463	48,643	337,500
1,000	8	12,500	28	446	49,090	350,000
1,000	8	12,500	29	431	49,521	362,500
1,000	8	12,500	30	417	49,937	375,000
1,000	8	12,500	31	403	50,341	387,500
1,000	8	12,500	32	391	50,731	400,000
1,000	8	12,500	33	379	51,110	412,500
1,000	8	12,500	34	368	51,478	425,000
1,000	8	12,500	35	357	51,835	437,500
1,000	8	12,500	36	347	52,182	450,000
1,000	8	12,500	37	338	52,520	462,500
1,000	8	12,500	38	329	52,849	475,000
1,000	8	12,500	39	321	53,169	487,500

(Continued)

TABLE 5.10 (Continued)

Large Loss	% Risk	Req. Equity	# Contracts	Per Contract 1 Contract Req	Accum	Net Result
1,000	8	12,500	40	313	53,482	500,000
1,000	8	12,500	41	305	53,787	512,500
1,000	8	12,500	42	298	54,084	525,000
1,000	8	12,500	43	291	54,375	537,500
1,000	8	12,500	44	284	54,659	550,000
1,000	8	12,500	45	278	54,937	562,500
1,000	8	12,500	46	272	55,209	575,000
1,000	8	12,500	47	266	55,475	587,500
1,000	8	12,500	48	260	55,735	600,000
1,000	8	12,500	49	255	55,990	612,500
1,000	8	12,500	50	250	56,240	625,000
1,000	8	12,500	51	245	56,485	637,500
1,000	8	12,500	52	240	56,726	650,000
1,000	8	12,500	53	236	56,961	662,500
1,000	8	12,500	54	231	57,193	675,000
1,000	8	12,500	55	227	57,420	687,500

TABLE 5.11 $2,000 Loss Risking 8%

Large Loss	% Risk	Req. Equity	# Contracts	Per Contract 1 Contract Req	Accum	Net Result
$2,000	8	$25,000	1	$25,000	$ 25,000	$ 25,000
2,000	8	25,000	2	12,500	37,500	50,000
2,000	8	25,000	3	8,333	45,833	75,000
2,000	8	25,000	4	6,250	52,083	100,000
2,000	8	25,000	5	5,000	57,083	125,000
2,000	8	25,000	6	4,167	61,250	150,000
2,000	8	25,000	7	3,571	64,821	175,000
2,000	8	25,000	8	3,125	67,946	200,000
2,000	8	25,000	9	2,778	70,724	225,000
2,000	8	25,000	10	2,500	73,224	250,000
2,000	8	25,000	11	2,273	75,497	275,000
2,000	8	25,000	12	2,083	77,580	300,000
2,000	8	25,000	13	1,923	79,503	325,000
2,000	8	25,000	14	1,786	81,289	350,000

TABLE 5.11 (Continued)

Large Loss	% Risk	Req. Equity	# Contracts	Per Contract 1 Contract Req	Accum	Net Result
2,000	8	25,000	15	**1,667**	**82,956**	375,000
2,000	8	25,000	16	1,563	84,518	400,000
2,000	8	25,000	17	1,471	85,989	425,000
2,000	8	25,000	18	1,389	87,378	450,000
2,000	8	25,000	19	1,316	88,693	475,000
2,000	8	25,000	20	1,250	89,943	500,000
2,000	8	25,000	21	1,190	91,134	525,000
2,000	8	25,000	22	1,136	92,270	550,000
2,000	8	25,000	23	1,087	93,357	575,000
2,000	8	25,000	24	1,042	94,399	600,000
2,000	8	25,000	25	1,000	95,399	625,000
2,000	8	25,000	26	962	96,360	650,000
2,000	8	25,000	27	926	97,286	675,000
2,000	8	25,000	28	893	98,179	700,000
2,000	8	25,000	29	862	99,041	725,000
2,000	8	25,000	30	833	99,875	750,000
2,000	8	25,000	31	806	100,681	775,000
2,000	8	25,000	32	781	101,462	800,000
2,000	8	25,000	33	758	102,220	825,000
2,000	8	25,000	34	735	102,955	850,000
2,000	8	25,000	35	714	103,670	875,000
2,000	8	25,000	36	694	104,364	900,000
2,000	8	25,000	37	676	105,040	925,000
2,000	8	25,000	38	658	105,698	950,000
2,000	8	25,000	39	641	106,339	975,000
2,000	8	25,000	40	625	106,964	1,000,000
2,000	8	25,000	41	610	107,573	1,025,000
2,000	8	25,000	42	595	108,169	1,050,000
2,000	8	25,000	43	581	108,750	1,075,000
2,000	8	25,000	44	568	109,318	1,100,000
2,000	8	25,000	45	556	109,874	1,125,000
2,000	8	25,000	46	543	110,417	1,150,000
2,000	8	25,000	47	532	110,949	1,175,000
2,000	8	25,000	48	521	111,470	1,200,000
2,000	8	25,000	49	510	111,980	1,225,000
2,000	8	25,000	50	500	112,480	1,250,000
2,000	8	25,000	51	490	112,970	1,275,000
2,000	8	25,000	52	481	113,451	1,300,000
2,000	8	25,000	53	472	113,923	1,325,000
2,000	8	25,000	54	463	114,386	1,350,000
2,000	8	25,000	55	455	114,840	1,375,000

TABLE 5.12 $1,000 Loss Risking 9%

Large Loss	% Risk	Req. Equity	# Contracts	Per Contract Req	1 Contract Accum	Net Result
$1,000	9	$11,111	1	$11,111	$11,111	$ 11,111
1,000	9	11,111	2	5,556	16,667	22,222
1,000	9	11,111	3	3,704	20,370	33,333
1,000	9	11,111	4	2,778	23,148	44,444
1,000	9	11,111	5	2,222	25,370	55,556
1,000	9	11,111	6	1,852	27,222	66,667
1,000	9	11,111	7	1,587	28,810	77,778
1,000	9	11,111	8	1,389	30,198	88,889
1,000	9	11,111	9	1,235	31,433	100,000
1,000	9	11,111	10	1,111	32,544	111,111
1,000	9	11,111	11	1,010	33,554	122,222
1,000	9	11,111	12	926	34,480	133,333
1,000	9	11,111	13	855	35,335	**144,444**
1,000	9	11,111	14	794	36,128	**155,556**
1,000	9	11,111	15	741	36,869	**166,667**
1,000	9	11,111	16	694	37,564	**177,778**
1,000	9	11,111	17	654	38,217	**188,889**
1,000	9	11,111	18	617	38,835	200,000
1,000	9	11,111	19	585	39,419	211,111
1,000	9	11,111	20	556	39,975	222,222
1,000	9	11,111	21	529	40,504	233,333
1,000	9	11,111	22	505	41,009	244,444
1,000	9	11,111	23	483	41,492	255,556
1,000	9	11,111	24	463	41,955	266,667
1,000	9	11,111	25	444	42,400	277,778
1,000	9	11,111	26	427	42,827	288,889
1,000	9	11,111	27	412	43,238	300,000
1,000	9	11,111	28	397	43,635	311,111
1,000	9	11,111	29	383	44,018	322,222
1,000	9	11,111	30	370	44,389	333,333
1,000	9	11,111	31	358	44,747	344,444
1,000	9	11,111	32	347	45,094	355,556
1,000	9	11,111	33	337	45,431	366,667
1,000	9	11,111	34	327	45,758	377,778
1,000	9	11,111	35	317	46,075	388,889
1,000	9	11,111	36	309	46,384	400,000
1,000	9	11,111	37	300	46,684	411,111
1,000	9	11,111	38	292	46,977	422,222
1,000	9	11,111	39	285	47,262	433,333
1,000	9	11,111	40	278	47,539	444,444
1,000	9	11,111	41	271	47,810	455,556

TABLE 5.12 (Continued)

Large Loss	% Risk	Req. Equity	# Contracts	Per Contract Req	1 Contract Accum	Net Result
1,000	9	11,111	42	265	48,075	466,667
1,000	9	11,111	43	258	48,333	477,778
1,000	9	11,111	44	253	48,586	488,889
1,000	9	11,111	45	247	48,833	500,000
1,000	9	11,111	46	242	49,074	511,111
1,000	9	11,111	47	236	49,311	522,222
1,000	9	11,111	48	231	49,542	533,333
1,000	9	11,111	49	227	49,769	544,444
1,000	9	11,111	50	222	49,991	555,556
1,000	9	11,111	51	218	50,209	566,667
1,000	9	11,111	52	214	50,423	577,778
1,000	9	11,111	53	210	50,632	588,889
1,000	9	11,111	54	206	50,838	600,000
1,000	9	11,111	55	202	51.040	611,111

TABLE 5.13 $2,000 Loss Risking 9%

Large Loss	% Risk	Req. Equity	# Contracts	Per Contract Req	1 Contract Accum	Net Result
$2,000	9	$22,222	1	$22.222	$ 22.222	$ 22,222
2,000	9	22,222	2	11,111	33,333	44,444
2,000	9	22,222	3	7,407	40,741	66,667
2,000	9	22,222	4	5,556	46,296	88,889
2,000	9	22,222	5	4,444	50,741	111,111
2,000	9	22,222	6	3,704	54,444	133,333
2,000	9	22,222		3,175	57,619	155,556
2,000	9	22,222	8	2,778	60,397	177,778
2,000	9	22,222	9	2,469	62,866	200,000
2,000	9	22,222	10	2,222	65,088	222,222
2,000	9	22,222	11	2,020	67,108	244,444
2,000	9	22,222	12	1,852	68,960	266,667
2,000	9	22,222	13	1,709	70,670	288,889
2,000	9	22,222	14	1,587	72,257	311,111

(Continued)

TABLE 5.13 (Continued)

Large Loss	% Risk	Req. Equity	# Contracts	Per Contract 1 Req	Contract Accum	Net Result
2,000	9	22,222	15	1,481	73,738	333,333
2,000	9	22,222	16	1,389	75,127	355,556
2,000	9	22,222	17	1,307	76,435	377,778
2,000	9	22,222	18	1,235	77,669	400,000
2,000	9	22,222	19	1,170	78,839	422,222
2,000	9	22,222	20	1,111	79,950	444,444
2,000	9	22,222	21	1,058	81,008	466,667
2,000	9	22,222	22	1,010	82,018	488,889
2,000	9	22,222	23	966	82,984	511,111
2,000	9	22,222	24	926	83,910	533,333
2,000	9	22,222	25	889	84,799	555,556
2,000	9	22,222	26	855	85,654	577,778
2,000	9	22,222	27	823	86,477	600,000
2,000	9	22,222	28	794	87,270	622,222
2,000	9	22,222	29	766	88,037	644,444
2,000	9	22,222	30	741	88,777	666,667
2,000	9	22,222	31	717	89,494	688,889
2,000	9	22,222	32	694	90,189	711,111
2,000	9	22,222	33	673	90,862	733,333
2,000	9	22,222	34	654	91,516	755,556
2,000	9	22,222	35	635	92,151	777,778
2,000	9	22,222	36	617	92,768	800,000
2,000	9	22,222	37	601	93,369	822,222
2,000	9	22,222	38	585	93,953	844,444
2,000	9	22,222	39	570	94,523	866,667
2,000	9	22,222	40	556	95,079	888,889
2,000	9	22,222	41	542	95,621	911,111
2,000	9	22,222	42	529	96,150	933,333
2,000	9	22,222	43	517	96,667	955,556
2,000	9	22,222	44	505	97,172	977,778
2,000	9	22,222	45	494	97,666	1,000,000
2,000	9	22,222	46	483	98,149	1,022,222
2,000	9	22,222	47	473	98,621	1,044,444
2,000	9	22,222	48	463	99,084	1,066,667
2,000	9	22,222	49	454	99,538	1,088,889
2,000	9	22,222	50	444	99,982	1,111,111
2,000	9	22,222	51	436	100,418	1,133,333
2,000	9	22,222	52	427	100,845	1,155,556
2,000	9	22,222	53	419	101,265	1,177,778
2,000	9	22,222	54	412	101,676	1,200,000
2,000	9	22,222	55	404	102,080	1,222,222

Table 5.13 requires $75,000 in single contract profits to reach $350,000 with the money management. An additional $22,000 in single contract profits will boost money management profits to $1,000,000 trading 45 contracts. A $6,000 drawdown would produce a 25 percent loss in this scenario.

OPTIMAL F

Another form of the Fixed Fractional method is called optimal f. Ralph Vince made this method popular. It stands for the optimal fixed fraction to trade on any given scenario. Optimal f is defined as the fixed fraction that will yield more returns than any other fixed fraction applied to the same scenario. Our first example with the coin flip yielded more profits with the 25 percent reinvestment strategy than either the fixed fraction below it, 15 percent, or the two fixed fractions above, 40 percent and 51 percent. In fact, applying either 24 percent or 26 percent would have yielded fewer profits.

At first glance, this seems to be the way to go. It can have phenomenal effects on the growth of the account. However, it also can, and most of the time will, have devastating effects on the account. It first needs to be pointed out that every situation is going to have a different optimal f. The coin flip example was based on set parameters and probabilities. Trading may have set parameters, but the results won't necessarily remain within the confines of those parameters. If I have a strategy that trades the futures markets with a set $500 stop and a set profit target of $1,000 and no other exit rules in place, slippage may cause several of my losses to be larger than the $500 set stop. If I hold positions overnight and the market gaps against the direction of the trade, the potential loss is quite a bit larger than where the stop was set. Further, the probability of winning trades to losing trades may be 50 percent for the last 100 trades, but the probability is past, not future data. These probabilities cannot be relied on in the same manner as a coin landing heads or tails.

Because we are dealing with nonpredictive probabilities, each trading outcome must have a mathematical formula circled through each of the trades to determine the optimal fixed fraction for *those previous trades.* This is the biggest problem with the optimal f method barring the risk factors. It is not predictive in trading, it is conformed to a past set of data. As a result, optimal f for the previous

100 trades may be 15 percent, but during the next 100 trades, it may only be 9 percent. If the previous 100 trades yielded a 15 percent optimal f and you decide to trade that on the next 100 trades, you would not be trading optimal f for those trades. You would be overtrading optimal f and thus your account.

The dynamics of the Optimal f method can be best illustrated with a bell curve. Optimal f would represent the very top of the curve with everything to the right and to the left sloping down. In the scenario with the coin flip, 10 percent yielded less than 25 percent and 25 percent yielded more than 40 percent. At the same time, three of these yielded a much greater outcome than without any reinvestment scheme. However, by increasing the percentage risked on each trade to 51 percent, the positive expectation became a losing situation. Hence, trading a percentage too far to the right of the bell curve could mean disaster.

In the sequence of trades in Table 5.14, the first 30 trades have an optimal f of 41 percent. Now take the 30 trades immediately following the original 30 and calculate the optimal f for these 30 trades.

Notice the optimal f for the second set of trades is 20 percent lower than the optimal f for the first 30. However, since we did not know that the optimal f for the second set of trades would be that much lower, we went ahead and applied the optimal f from the first set.

Not only did optimal f change for the second set of trades, it changed as soon as the 31st trade had been made. Practical application of the optimal f strategy optimizes over past data. Therefore, as soon as another trade is made, it gets thrown into the sequence and optimal f is reoptimized. And, it is reoptimized with every trade thereafter.

If you are saying to yourself that the way around trading the wrong optimal f for the entire second series of trades is to do exactly that, reoptimize after every trade, guess again. When the optimal f for the first series of trades was calculated, that is exactly what it was calculated for, the first series. When the optimal f was calculated for the second series, the calculation was completely independent of the first series. Therefore, when you reoptimize for each trade, after you have reached the end of the second series, the optimal f is 31 percent instead of 41 percent for the first series and 21 percent for the second series. As a result, you still overtraded f on the second series because it was taking into account the first 30 trades (see Chapter 14 to see the probabilities of sets of trades repeating themselves).

These problems with actually applying the optimal f don't even touch on the risk involved with the method, even if you are somehow able to predict what the optimal f is going to be on the next set of

TABLE 5.14 Optimal f Trades

Trade		Optimal f
($29)	($238)	41%
$18	#	41
(24)	(6)	41
51	45	41
(12)	33	41
(16)	17	41
42	59	41
37	96	41
(5)	91	41
15	106	41
(21)	85	41
39	124	41
27	151	41
14	165	41
(24)	141	41
(24)	117	41
32	149	41
41	190	41
18	208	41
11	219	41
(15)	204	41
17	221	41
(26)	195	41
4	199	41
19	218	41
41	259	41
(8)	251	41
(18)	233	41
20	253	41
14	267	41
(29)	238	41

(Continued)

trades (which is impossible). Once again, take the coin flip example in Chapter 2, where optimal f is 25 percent. With a coin-flipping scenario and only $100 to bet with, the strategy isn't that bad. You know the probability, you know that you will eventually make money, even if you suffer a terrible string of losing trades in a row.

TABLE 5.14 (Continued)

Trade		Optimal f
14	14	21
(17)	(3)	21
11	8	21
15	23	21
(25)	(2)	21
14	12	21
24	36	21
(19)	17	21
(18)	(1)	21
16	15	21
(29)	(14)	21
(29)	(43)	21
(13)	(56)	21
(8)	(64)	21
(17)	(81)	21
23	(58)	21
11	(47)	21
(14)	(61)	21
38	(23)	21
22	(1)	21
34	33	21
(15)	18	21
(9)	9	21
18	27	21
31	58	21
22	80	21
27	107	21
(28)	79	21
9	88	21
(11)	77	21
21	98	21

TABLE 5.15 41% Optimalf Applied to Second Set of30 Trades

Entry Date	Exit Date	Market	P/L	Cumulative	Contracts
12/24/90	01/09/91	Figure fl	$14.00	$14.00	1
01/10/91	01/21/91	Figure fl	(17.00)	(3.00)	1
01/21/91	02/01/91	Figure fl	11.00	8.00	1
02/01/91	03/01/91	Figure fl	15.00	23.00	1
03/04/91	03/15/91	Figure fl	(25.00)	(2.00)	1
03/15/91	04/15/91	Figure fl	14.00	12.00	1
04/22/91	05/28/91	Figure fl	24.00	36.00	1
05/28/91	07/18/91	Figure fl	(19.00)	17.00	1
07/18/91	10/31/91	Figure fl	(18.00)	(1.00)	1
10/31/91	11/22/91	Figure fl	16.00	15.00	1
11/22/91	03/02/92	Figure fl	(29.00)	(14.00)	1
03/02/92	04/21/92	Figure fl	(29.00)	(43.00)	1
04/21/92	04/28/92	Figure fl	(13.00)	(56.00)	1
04/29/92	05/06/92	Figure fl	(8.00)	(64.00)	1
05/06/92	05/08/92	Figure fl	(17.00)	(81.00)	1
05/11/92	05/15/92	Figure fl	23.00	(58.00)	1
05/27/92	11/04/92	Figure fl	11.00	(47.00)	1
11/04/92	11/30/92	Figure fl	(14.00)	(61.00)	1
11/30/92	04/12/93	Figure fl	38.00	(23.00)	1
04/12/93	04/27/93	Figure fl	22.00	(1.00)	1
04/27/93	05/18/93	Figure fl	34.00	33.00	1
05/19/93	05/28/93	Figure fl	(15.00)	18.00	1
05/28/93	06/03/93	Figure fl	(9.00)	9.00	1
06/04/93	06/11/93	Figure fl	18.00	27.00	1
07/26/93	11/17/93	Figure fl	31.00	58.00	1
11/17/93	12/16/93	Figure fl	22.00	80.00	2
12/16/93	01/11/94	Figure fl	27.00	107.00	2
01/11/94	01/25/94	Figure fl	(56.00)	51.00	1
01/25/94	02/07/94	Figure fl	18.00	69.00	1
02/08/94	02/18/94	Figure fl	(11.00)	58.00	1
03/18/94	06/20/94	Figure fl	21.00	79.00	2

In fact, you will have to suffer 16 losses in a row before you are down to the minimum bet of $1. The higher the account moves over $100, the bigger the string of losses required to put you out of the game. After about 30 trades equal in the number of wins and losses, the account would be approximately $780 and it would take a string of 23

losers in a row to put you out of the game. With these odds, there is no reason to worry about the potential drawdown since 16 losing tosses in a row is unlikely. However, comparing a coin-flipping game to trading is worse than comparing oranges and apples, it is more like comparing potatoes and moldy tangerines. There is no comparison. Trading is completely unpredictable, regardless of what numbers can be generated with historical results. Don't get me wrong, logic can be applied that will bring conclusions of reasonable expectations and reasonable probabilities, but no mathematical equation can guarantee that after x number of trades, 50 percent will be winners and 50 percent will be losers or if not 50/50, very close. Trading strategies are formed based on logic and, for the most part, previous market action. Market action changes. What may have been a favorable logic for trading yesterday, may not be a favorable logic for trading today. Therefore, it is ludicrous to think that the kind of risk taken with the coin-flipping scenario can be transferred to trading, whether it be stocks, options, or futures (or anything in between).

Consider for a moment that the optimal f for the past trades of a system you are going to trade is in fact 25 percent. As pointed out in the section "One Contract for every $10,000," if the first trade is a loser, the account will draw down 25 percent on that single trade. If the second trade is a loser, the account will draw down 44 percent on just two trades. More consecutive losers bring the drawdown to 58 percent and then 69 percent, and by the time five losers in a row have been suffered, close to 77 percent of the account is gone. Transferring the same numbers into futures trading, for every win, you bring in $2,000 and for every loss you give up $1,000. This means that you will trade one contract for every $4,000 in the account.

$1,000 largest loss / .25 risk = $4,000

As a result, you will be trading 25 contracts with a $100,000 account. Suppose that the market gapped against the direction of a trade and instead of a $1,000 loss, it became a $2,000 loss per contract. Half the account would be gone on that trade. There are 100 other logical reasons why optimal f is great math but useless when it comes to practical application in trading. However, the few facts I have revealed thus far make it unnecessary to continue the tomato throwing at the method. The risk alone is reason not to use it. If you think you can handle the risk, then make sure you understand what it is before you attempt to apply it to your trading.

SECURE F

This is a method that I have been asked about in more recent days. It is simply a variation of the Fixed Fractional method that tries to take advantage of the optimal f method by using something other than the largest loss as a starting point, In 1995, I worked on a similar method and published the results in the November 1995 issue of the *KamiKaze Trading Newsletter*. That work and publication extended the optimal f theory from using the largest potential loss to the largest expected drawdown. For example, if the largest loss was $1,500 and the optimal f had been calculated at 19 percent, then I would trade one contract for every $7,895 in the account. Starting with $100,000 in the account, I would be trading 12 contracts. Once again, I would also be risking 19 percent on one trade. With the new way of calculating optimal f based on drawdown instead of the largest loss, 19 percent would be the maximum the account could lose based on the largest expected drawdown. If the largest expected drawdown was $7,500 then instead of dividing $1,500 by 19 percent, I would divide the $7,500 by the same 19 percent. This comes to one contract for every $39,473. According to this rule, I would only trade two contracts with $100,000. Further, I would not decrease to one contract until the account diminished to below $79,000. To decrease to that level, the system or strategy would require a larger drawdown than the $7,500 based on a single contract.

The problem is that this method is no more useful than any of the other Fixed Fractional methods that have been explained. It is still the Fixed Fractional method. The only difference is that instead of risking 19 percent on a per trade basis, it is risking only 3.8 percent on a per trade basis.

$7,500 largest expected drawdown / 19% = $39.473

$39,473 / 1,500 = 3.8% risk on every trade

As a result, you are right back to the situation where it might take a few years to even apply the money management, and many more years than that to see a significant effect on your account, especially for the smaller traders.

The Secure f method can take into consideration things other than the largest possible drawdown to ease the risk created by the

optimal f method. However, it doesn't matter which way the method is sliced, diced, or cut, it is still Fixed Fractional and you still have the same problems when applying it to actual trading.

OTHER ODDS AND ENDS ABOUT FIXED FRACTIONAL TRADING

For the most part, the problems and the result of the problems are generally self-evident; I have also pointed out many of them in the previous sections of this chapter. However, a few other characteristics of the method make it both inefficient and illogical to apply to actual trading.

Fixed Fractional . . . Or Is It?

Something that I have never seen anyone else point out is that Fixed Fractional Trading is actually not fixed at all. At least not when it comes to trading. You may have noticed that earlier, in the example of switching the optimal f calculation from the largest loss to the largest potential drawdown so that if the drawdown were realized, the loss on the account would not exceed the original optimal f. The example we used was 19 percent. In that same example, I stated that if the largest drawdown were to occur from the beginning and a $100,000 account balance was used, the account would not even make it to the $79,000 level which is where it would go trading only a single contract. In fact, if two contracts were being traded and the largest drawdown was suffered, the account would only drop to $85,000, which is a 15 percent decrease, not 19 percent. This is because fractional contracts or fractional options are not possible. Therefore, once levels are established, the number of contracts or options to be traded must remain the same until the next level is reached.

If we were to trade one contract for every $10,000 in the account with a potential largest loss of $750, we would be risking 7.5 percent on every trade. We would increase and decrease according to the following:

1 contract from $10,000 to $19,999
2 contracts from $20,000 to $29,999

3 contracts from $30,000 to $39,999
4 contracts from $40,000 to $49,999

And so the table continues on in the same manner forever. Notice though that if the account is anywhere in between these levels, the amount being risked on a per trade basis is less than the 7.5 percent. If the account is at $15,000 and the $750 loss is incurred, the actual percentage lost on the trade is only 5 percent. If the account is at $19,000, and the loss is suffered, it is only 3.9 percent of the account. At higher levels, the difference in the percentages between levels decreases; it is not truly a Fixed Fractional method. If the account were at $43,000 ($3,000 above the 3-4 contract level) and trading 4 contracts, the total loss would be $3,000, or only 6.25 percent of the account instead of 7.5 percent. However, at $13,000, ($3,000 above the minimum level) the risk is 5.7 percent, not 6.25 percent as it is $3,000 above the $40,000 level. The explanation for this appears in the following section.

Unequal Achievement

Through my research, I came to the conclusion that this was the root of most of the problems with the Fixed Fractional trading method. The Fixed Fractional method requires unequal achievement at different contract levels. More simply put, if you are trading one contract for every $10,000 in the account and therefore start out with $10,000 and trading one contract, that one contract must produce the entire $10,000 in profits required to increase to two contracts. However, once the two-contract level is being traded, that same $10,000 in additional profits to increase is being achieved by two contracts, not one (Figure 5.1). As a result, the system or strategy that required $10,000 in profits based on a single contract to increase contracts, now only requires $5,000 in profits based on a single contract to increase contracts to three. At $100,000 trading 10 contracts, the same system need only produce $1,000 in profits to increase to 11 contracts. At $500,000, a $1,000 winning trade will boost the number of contracts from 50 to 55. This means that a $200 profitable trade will increase contracts at that level.

The effect of this problem is the same as mentioned previously in this chapter. Smaller accounts, risking a reasonable percentage on every trade, will have to wait a very long time as a general rule to begin benefiting from money management. However, once the

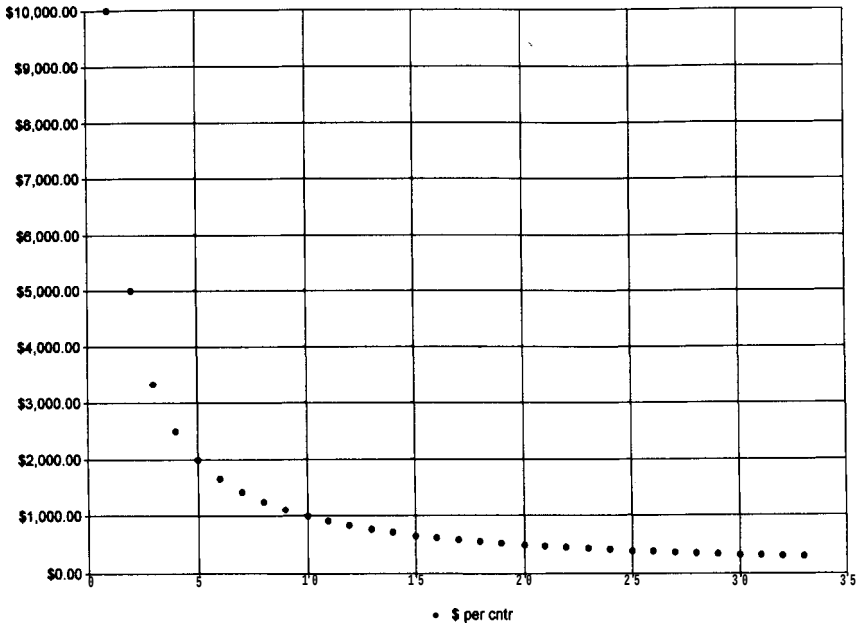

Figure 5.1 Dollars required per contract-10%.

account is built up (10 years later), it begins to jump contracts wildly. It can be summed up this way: Reasonable fixed fractions take too long to increase on the front end and increase too fast on the back end. This is why back testing the fixed fractional method on moderate periods of time with moderate profitability can be into the thousands of contracts at the end of the run.

Sequence of Trades

In the purest application of Fixed Fractional trading, the sequence of trades does not alter the final outcome after applying the Fixed Fractional method. However, this is not true in practical application. What I mean by "purest application" is that applying the method is unhindered by any outside limitations. In the world of no limitations, if a frog was 10 feet from a wall and jumped ½ of the distance to the wall on every jump, the frog would never reach the wall. However, for that to be true, the frog would have to get smaller. If the frog is 2 inches from front to back, as soon as the distance between the frog

and the wall reached less than 4 inches, the next jump would cause the frog to touch the wall. Therefore, there is a limitation to this theory in the real world.

Frog = 2 inches from front to back
Back of Frog = 10 feet from the wall

First jump = 60 inches (5 feet)
Second jump = 30 inches
Third jump = 15 inches
Fourth jump = 7.5 inches
Fifth jump = 3.75 inches
Sixth jump = 1.875 inches . . . the frog is now touching the wall.

Likewise in trading. If Joe Trader risks 10 percent of his capital on every trade, there is a point at which he no longer has enough capital to actually take any trades. This is the same limitation that causes the sequence of trades to alter the final outcome when applying any type of money management.

The example on pages 78-79 demonstrates this practical truth. Trading a single contract, Joe Trader determines that as soon as he achieves $3,000 in profits, he will increase the number of contracts traded on the following trade to two. If profits fall below the $3,000 level, Joe goes back to trading a single contract.

Sequence 1 has three winners in a row of $1,000. It is then followed by a ($1,000) loss, followed by a $1,000 win, a ($1,000) loss, another a $1,000 win and finally a ($1,000) loss. The total outcome is net positive $2,000. Sequence 2 has the same alternating $1,000 wins and losses first, followed by the three consecutive $1,000 winners. The total outcome in sequence two without money management is also $2,000.

Sequence 1 (with) is the first sequence; however, money management is applied according to the $3,000 profit level. As a result of incurring the three consecutive profitable trades first, Joe is able to go to two contracts. However, the next trade is a loser for ($1,000) and therefore, Joe must go back down to a single contract. Unfortunately, Joe's ($1,000) loss came with two contracts, which put him back at $1,000, accumulated profits instead of $2,000 that was achieved without the money management.

Sequence 1 (w/o)

P/(L)	Accum.
$1,000.00	$1,000.00
$1,000.00	$2,000.00
$1,000.00	$3,000.00
($1,000.00)	$2,000.00
$1,000.00	$3,000.00
($1,000.00)	$2,000.00
$1,000.00	$3,000.00
($1,000.00)	$2,000.00

Sequence 2 (w/o)

P/(L)	Accum.
($1,000.00)	($1,000.00)
$1,000.00	$0.00
($1,000.00)	($1,000.00)
$1,000.00	$0.00
($1,000.00)	($1,000.00)
$1,000.00	$0.00
$1,000.00	$1,000.00
$1,000.00	$2,000.00

Sequence 1 (with)

P/(L)	Accum.	
$1,000.00	$1,000.00	
$1,000.00	$2,000.00	
$1,000.00	$3,000.00	Goes to two contracts on next trade
($2,000.00)	$1,000.00	Goes back to one contract on next trade.

$1,000.00	$2,000.00
($1,000.00)	$1,000.00
$1,000.00	$2,000.00
($1,000.00)	$1,000.00

Sequence 2 (with)

P/(L)	Accum.
($1,000.00)	$1,000.00
($1,000.00)	($1,000.00)
$1,000.00	$0.00
($1,000.00)	($1,000.00)
$1,000.00	$0.00
($1,000.00)	($1,000.00)
$1,000.00	$0.00
$1,000.00	$1,000.00
$1,000.00	$2,000.00

It doesn't matter which money management is being used to increase the number of contracts being traded. As long as the method is an antimartingale type money management method, similar outcomes will be produced in similar scenarios. The illustration simply shows that in the practical application of the Fixed Fractional money management method, sequence of trades can make a big difference in the final outcome.

6

FIXED RATIO TRADING

The next several chapters thoroughly explain, discuss, and illustrate the Fixed Ratio trading method. This method came as a direct result of researching and breaking down the Fixed Fractional method. However, it is not the same. Some will say that a fixed fraction and a fixed ratio are the same thing and therefore, the two methods are the same as well. This reasoning is as superficial as judging a book by its title. Bear is also spelled bare but the words have completely different meanings, and if I were to say "bear" without any context, you wouldn't know whether I meant bear or bare. Likewise, the terms Fixed Fractional trading and Fixed Ratio trading are similar but represent different concepts.

If you have skipped Chapter 5, I highly recommend that you go back and read it now. Even though the Fixed Ratio method is completely different in functionality and every other characteristic, it was developed as a direct result of breaking down the former method, isolating the pros and cons as well as the causes of each. Understanding the Fixed Fractional method will help you understand not only the mechanics of the Fixed Ratio method, but also why it is the only practical money management method available.

RISK AND REWARD

Proper money management should address two basic topics, risk and reward. A trader cannot address one without addressing the other and expect to benefit from money management. This was one of the main problems with the Fixed Fractional methods. Any variation of the

method either addressed the growth without the overall risks (i.e., optimal f) or it addressed the risks (i.e., risking less than 3 percent on each trade), which would inadvertently leave the potential reward faltering like a bird with one wing. There were attempts to address both of these topics somewhere in between the 3 percent or less variation and the optimal f variation. However, the efficiency of doing so was flawed by the characteristics of the method itself. Therefore, no matter what fixed fractional method is applied, either the risk, the reward, or both are inadequately addressed.

The goal behind developing a new money management method was to start by addressing both the risks and rewards of money management in general. As stated earlier, for any situation with a positive outcome, the only type of money management that should be used is an antimartingale type method. This means that as equity increases, the size of the investment or trade should also increase. As equity decreases, the size of the investment or trade should also decrease. This is opposite of the martingale type where size increases as equity decreases and vice versa. Therefore, the type of money management must stay the same as for the Fixed Fractional. Using that as a beginning point, I began to list the pros and cons of the method. My list looked something like this:

Pros

1. Geometric growth was possible with higher percentages.
2. Risk could be maintained with lower percentages.

Cons

1. Using higher percentages subjected the account to catastrophic risks.
2. Using lower percentages took too long to implement and therefore was inefficient.
3. Using a percentage in between did not properly proportion the reward potential with the risk potential.

After contemplating these pros and cons for awhile, I decided that the root of the problem was that the method required unequal achievement. It was illogical for the Fixed Fractional method to require more profits from the system or strategy at the beginning and less and less profits as the equity increases. If anything, I concluded,

it should be the other way around. A money management method should require fewer profits at the beginning (hence be more efficient) and more profits as the equity increased (which would address the risk).

At first, I tried different ideas for increasing the required amount to increase contracts, but I wasn't completely satisfied. Then it dawned on me that the answer is in the relationship of number of contracts being traded to the amount of profits required to increase to an additional contract. And, that relationship should remain fixed. If the money management required $10,000 in profits trading one contract to increase to two contracts, than it should require $20,000 additional profits when trading two contracts to increase to three. Hence, this relationship was a fixed ratio of contracts to required profits. This is how the Fixed Ratio method came to be and how it earned the name Fixed Ratio.

The Fixed Ratio method has only one variable, the delta. This variable simply fits into the mathematical formula of the method and determines how aggressively or conservatively to apply the money management. The lower the variable, the more aggressive the application. The higher the variable, the more conservative the application. There is no bell curve with the Fixed Ratio method.

The following comparison of the Fixed Fractional and Fixed Ratio methods shows where the increase levels are and how they relate to one another:

Fixed Fractional		Fixed Ratio	
Number of Contracts	Required Account Balance	Number of Contracts	Required Account Balance
1	$10,000	1	$10,000
2	20,000	2	20,000
3	30,000		
4	40,000	3	40,000
5	50,000		
6	60,000		
7	70,000	4	70,000

As the number of contracts increase with the Fixed Ratio method, the amount required for the next increase in contracts increases exactly proportionally. As a result, the risk decreases far below that of

the Fixed Fractional method. However, according to this scale, the geometric growth is much quicker with the Fixed Fractional method. In fact, barring the effects of asymmetrical leverage, it will take $19,375 in profits based on a single contract to reach the $70,000 account level for this Fixed Fractional method. Using the Fixed Ratio method of 1 contract per $10,000 in profits, it would take $40,000 to reach the $70,000 level. This is double the amount of the Fixed Fractional method.

Because the risk is so much less with the Fixed Ratio method, a smaller Fixed Ratio may be used. One of the problems with the fixed fractional method is that it takes too long to begin using the money management in trading due to the large sum of money one contract must generate. The Fixed Ratio method has decreased the risk on the long end of the trading and therefore may be utilized quicker on the front end of trading. The comparison of the Fixed Ratio and the Fixed Fractional method can be made with a smaller delta (or Fixed Ratio):

Fixed Fractional		Fixed Ratio	
Number of Contracts	Required Account Balance	Number of Contracts	Required Account Balance
1	$10,000	1	$10,000
2	20,000	2	15,000
3	30,000	3	25,000
4	40,000	4	40,000
5	50,000	5	60,000
6	60,000		
7	70,000		

With this example, the Fixed Fractional is using one contract for every $10,000 in the account while the Fixed Ratio is using a delta of $5,000. As a result, it only took $20,000 to reach the $60,000 level instead of $40,000 to reach the $70,000 level. Further, another $5,000 in profits would take the account up to $85,000. Therefore, the geometric growth of the account is starting to really kick in at this time.

The formula for calculating the levels at which contracts (or options or shares of stock) will be increased is as follows:

Previous required equity + (No. of contracts x delta) = Next level

Starting balance (first required level) = $10,000

No. of contracts = 1

Delta = $5,000

$10,000 + (1 x $5,000) = $15,000 to increase to 1 contracts

If the account balance goes above $15,000, then $15,000 becomes the previous required level in the equation:

$15,000 + (2 x $5,000) = $25,000

$25,000 + (3 x $5,000) = $40,000

$40,000 + (4 x $5,000) = $60,000

$60,000 + (5 × $5,000) = $85,000

The word *delta* stands for change. It is the only variable in the equation that the user freely changes to fit a particular method and/or trading style. It is also the variable that can change the dynamics of the outcome. As a general rule, the smaller the delta, the more aggressive the money management, the larger the delta the more conservative the method.

Fixed Ratio trading has a relationship of dollars required to number of contracts being traded to achieve those dollars. This relationship is a 1:1 ratio. Multiply the number of contracts and the dollar amount required to achieve an additional contract must be multiplied by the same number. If the ratio is 1:$5,000, then you know that to increase from 10 to 11 contracts, you will have to achieve $50,000 in profits:

1 x 10 = 10

$5,000 x 10 = $50,000

This number is not the same as the required account balance. It is the amount of additional profits required to increase to the next level.

Because of this relationship, other relationships exist within the method that allow us several additional benefits. First, because of this relationship, we can estimate the performance of any system or strategy simply by plugging in a few statistics. If a particular trading strategy in the bond market produced $50,000 in profits over the course of 100 trades, the average trade is $500 ($50,000 ÷ 100 = $500). Since the relationship of the Fixed Ratio method of dollars required to increase remains exactly proportionate to the number of contracts being traded, we also know that if we have an average trade of $500 using a $5,000 delta, we will increase contracts on average once every 10 trades. If it takes 10 trades to increase from 1 to 2 contracts, it will take 10 trades to increase from 10 contracts to 11 (on average):

Profits required to increase to 2 contract = $5,000

$5,000 / $500 = 10 (trades on average)

To increase from 10 contracts to 11 will require $50,000 in profits:

10 contracts x $5,000 = $50,000

Since we are trading 10 contracts we know our average trade also increases by a factor of 10. Therefore, the equation is:

$50,000 / $5,000 = 10 trades

Thus, after 100 trades, we can estimate that we will be trading 10 contracts. If you were to extend the $5,000 delta table to 10 contracts, you would know that the $50,000 in profits based on trading a single contract should yield approximately $225,000:

$85,000 + (6 x $5,000) = $115,000

$115,000 + (7 x $5,000) = $150,000

$150,000 + (8 x $5,000) = $190,000

$190,000 + (9 x $5,000) = $235,000

Subtract the starting balance of $10,000 and you come up with $225,000 in profits! Obviously, trades do not carry the same average

in uniformity throughout the entire sequence of trades. The first 50 trades may have produced $35,000 of the profits (which makes the average trade $700), whereas the second 50 trades only produced $15,000 of the profits (which brings the average trade to $300 for the second 50 trades). It makes no difference in our estimate where the average is at any given point. For the method will simply increase contracts faster during the period when the average is at $700 than it will when the average is at $300.

However, this is only an estimate, and it is a liberal estimate at that. The reason it is not set in stone is asymmetrical leverage, which the estimate does not take into consideration. A conservative estimate that includes asymmetrical leverage is about 90 percent of the estimated profits. There is no possible mathematical formula for including asymmetrical leverage simply because it is solely determined on the sequence of trades, as discussed in Chapter 2.

After having acquired $100,000 in profits using the $5,000 as the delta for the Fixed Ratio method, we would be trading 20 contracts. The minimum level of profits to trade 20 contracts is $1,000,000. Therefore, what took 4 years to generate $225,000 estimated profits, generated $750,000 more in profits during the next 4 years. Notice that the rate of compounding remained relatively consistent. $225,000 is 450 percent more than trading a single contract in four years. $1,000,000 is 400 percent of $225,000 by continuing the method the following four years. The overall increase from trading one contract is 1,000 percent or 10 times greater!

We have talked about the profit potential, let's now take a look at the risk factors. With an account size of $240,000 and trading 10 contracts, if a drawdown of $5,000 per contract were to occur, the account would draw down to approximately $194,000 or 19 percent:

$240,000 trading 10 contracts with a $1,000 loss
= ($10,000)

$240,000 – $10,000 = $230,000 trading 9 contracts

9 x ($1,000) = ($9,000)

$230,000 – ($9,000) = $221,000 trading 9 contracts

9 x ($1,000) = ($9,000)

$221,000 – ($9,000) = $212,000 trading 9 contracts

9 x ($1,000) = ($9,000)

$212,000 – ($9,000) = $203,000 trading 9 contracts

9 x ($1,000) = ($9,000)

$203,000 – ($9,000) = $194,000 trading 9 contracts and the drawdown is over

If the same drawdown was suffered trading a single contract, the drawdown would be 8.3 percent of the account. Therefore, profits increased 450 percent while the risk only increased 11 percent! When comparing account sizes, would you rather risk 10 percent of $60,000 or 20 percent of $240,000? After the drawdown you would be at $55,000 trading a single contract and at $190,000 after trading with the Fixed Ratio method. This is still a 350 percent increase.

The ultimate comparison though is with the Fixed Fractional method. This comparison uses the one contract for every $10,000 scenario. With that scenario, after $50,000 in profits based on one contract, the method would have increased to $830,000 trading 83 contracts. After only the first loss of $1,000, the account would drop back by $83,000 to $747,000. After the full $5,000 drawdown, the account will be down to $490,000. This is still quite a bit higher than the conservative Fixed Fractional method but it would have been a 41 percent drop. Further, a $10,000 drawdown would drop the account to $291,000. Can you imagine going from $830,000 in profits to only $291,000 in profits from just a $10,000 drawdown? The account would be 52 percent higher, but the risk would be at 65 percent of the account. Nothing was gained on the risk-to-reward relationship.

Further, at $40,000 in profits (instead of $50,000), the account would be trading 30 contracts with only $300,000 in the account. This means that 64 percent of the profits came from just the last 20 percent of the performance record. If the drawdown were to occur at that point instead of the $50,000 profit level, the account would decrease to $180,000 and nothing would be gained.

You might be saying that the $800,000 is worth using the Fixed Fractional method and that you are willing to suffer a 41 percent risk with just $5,000 worth of drawdown. Or, even increase that drawdown to $10,000 with a drop in the account of 65 percent for the potential reward. It is true, you can trade a Fixed Fractional method and reach larger profits faster. If that is your goal, trade optimal f. However, I have spoken to many, many traders in the past and not one of them use optimal f because of the drawdowns. Most are not willing

to come so close to $1,000,000 only to give 65 percent of it back on a hic-up. Besides, the delta is an extremely conservative one to be applying when taking into consideration a small $5,000 possible drawdown. By decreasing the delta size to $2,500, that same $50,000 would turn into $485,000 trading 20 contracts while risking only 20 percent of that. After $30,000 in profits, the Fixed Fractional method would only be at $100,000 while the Fixed Ratio method using a $2,500 delta would be at $175,000. The $5,000 drawdown would take the Fixed Fractional method down to $60,000 while the Fixed Ratio method would take the account to $122,500, more than double that of the Fixed Fractional!

As you can see, there are a few trade-offs; however, when taking into consideration both risk and reward, the Fixed Ratio method offers a balance between the two. Drawdowns will happen and they often determine whether a trader continues to trade. The trader who cannot tolerate the drawdown will not be able to see it through to higher profits. The strategy will be dumped and replaced with another only to go into another drawdown. This is the cycle of most traders. You must take into consideration both the risk and the rewards of any money management method.

This brings us to another relationship that exists within the Fixed Ratio method. That relationship is with the drawdown. Similar to the relationship between the average trade and delta, there is also a relationship of the drawdown to the delta. For example, if the delta is $5,000 and the expected drawdown of the method is $10,000, the ratio of delta to drawdown is 1:2. Whatever is done on the side of the delta must also be done on the side of the drawdown. If you take the drawdown and divide it by the delta (in this case it is 2) you will have this relationship no matter where the drawdown occurs in relation to the number of contracts being traded. Should a drawdown occur, the account would suffer a loss that is equal to two deltas (or two contracts). If I reach the lo-contract level using the $5,000 delta and then suffer a drawdown of $10,000 per contract, I cannot decrease more than two contract levels. Therefore, I will be trading 8 contracts at the end of that drawdown. If I am trading 10 contracts with a $2,500 delta and suffer a $10,000 drawdown, I will not drop below trading 6 contracts at the end of the drawdown:

$10,000 drawdown / $2,500 delta = 4 delta levels (contracts)

10 – 4 = 6

The great thing about this relationship is that you not only know where you are at all times but what your risk is at any level of drawdown compared with the delta you are using. The following formula will yield each level of contract change without having to go through a tedious table process:

[(No. of contracts x No. of contracts – No. of contracts) / 2] x delta
= minimum profit level

If the number of contracts I am trading is 10 with a delta of $5,000, then the minimum profit level required would be $225,000:

10 x 10 = 100

100 – 10 = 90

90 / 2 = 45

45 x $5,000 = $225,000

At $225,000 in profits, I will change from 9 to 10 contracts and from 10 to 9 contracts depending on whether I go above or below that number.

By simply changing the "- No. of contracts" to a "+ No. of contracts," I can calculate the upper level of trading 10 contracts. At this level, I would increase from 10 to 11 and from 11 to 10 depending on whether I go above or below it:

10 x 10 = 100

100 + 10 = 110

110 / 2 = 55

55 x $5,000 = $275,000

I have now calculated the lower ($225,000), and upper ($275,000) profit levels for trading 10 contracts. These levels also serve as the upper level for 9 contracts and the lower level for 11 contracts. Since I am able to calculate these levels as well as calculate the maximum levels that any drawdown will decrease the account, I know the exact dollar risk at any given time. If my account is trading at $250,000 in profits, I know that should a $10,000 drawdown occur, I would not drop below the lower level of 8 contracts:

$$8 \times 8 = 64$$

$$64 - 8 = 56$$

$$56 / 2 = 28$$

$$28 \times \$5{,}000 = \$140{,}000$$

This is the minimum profits I will have if there is a $10,000 drawdown. However, if I wanted to be more exact, I could go a step further and calculate the distance between the 10 and 11 contract levels and that is where I would be between the 8 and 9 contract levels.

The amount of $250,000 is exactly halfway between the $225,000 lower level and the $275,000 upper level. The halfway mark between the upper level and lower level of 8 contracts is $160,000. This is where the $10,000 drawdown would drop the account:

$$10 \times 10 / 2 \times \$5{,}000 = \$250{,}000$$

$$8 \times 8 / 2 \times \$5{,}000 = \$160{,}000$$

The "-No. of contracts" portion of the equation calculates the lower level. The "+ No. of contracts" portion of the equation calculates the upper level. Therefore, leaving the plus or minus out of the equation will calculate the exact middle between the two equations. With these three as a reference, it is easy to calculate exactly where the account is in the level of contracts being traded to compare to another level. For example, if the account were at $230,000, then it is 20 percent of the way to the exact middle. Therefore, 80 percent of the number of contracts being traded would be subtracted in the equation. It is as follows:

$$10 \times .80 = 8$$

$$[(10 \times 10 - 8) / 21 \times \$5{,}000 =$$

$$46 \times \$5{,}000 = \$230{,}000$$

The compared drop after the drawdown would be as follows:

$$8 \times .8 = 6.4$$

$$[(8 \times 8 - 6.4) / 21 \times \$5{,}000 =$$

$$28.8 \times \$5{,}000 = \$144{,}000$$

This method allows you to know exactly what to expect during drawdown periods at any given time. Knowing what to expect is half the battle in preparing for what may come along.

APPLYING THE FIXED RATIO METHOD TO STOCK TRADING

There are some differences in applying the Fixed Ratio method, or any money management method for that matter, to stock trading. The difference, however, is not that the markets are inherently dissimilar. The most important fact to understand about money management, and specifically the Fixed Ratio method, is that this is a numbers game. We are not playing the markets or any aspect of the markets. Nor are we necessarily applying money management to the method or system that we are trading. We are applying money management to the net sum of the profits and losses generated by the markets, methods, or systems producing those profits or losses. Therefore, it doesn't matter whether the $500 profit came from IBM stock or the soybean market-$500 has the same value in any market.

Since we are playing a numbers game, we can completely ignore the markets and/or methods being applied and concentrate on the numbers being produced. With the stock market, however, applying the Fixed Ratio method is slightly different for two basic reasons. First, there is a large disparity in margin allowances and between stocks and commodities. Margin in commodities can sometimes be less than 10 percent of the value of the underlying market. One S&P 500 index contract (which is a futures contract in the stock market) is currently worth $318,000, but to trade one contract in that market requires less than $20,000. Margin is only about 6 percent of the value of the contract. Stocks, on the other hand, only allow a 50 percent margin rate. Therefore, if you buy $50,000 worth of IBM stock, you must have $25,000 in the account. Later, we discuss how this margin difference affects the application of money management.

The second major reason for the difference in application is the ability to trade odd lots. It used to be very hard to find a broker who would actively trade 103 shares of a stock or 17 shares of a stock; now you can find them all day long. Odd lots are exactly what they sound like, a position size other than a nice round number. The most common size was 100 shares, which is also the value of one option in

stocks. One option is on the value of 100 shares. Nonetheless, this ability to trade odd lots allows for highly efficient money management application.

These are the two major differences when applying the Fixed Ratio to trading stocks, but before continuing, I need to stress that this type of money management is not for buy-and-hold strategies. Buying and holding is a method of investment. You might consider a trading account to be an investment; however, the trades themselves are normally based on active buying and selling. Wal-Mart stock bought back in the 1970s and held today is definitely an investment. Money management requires increasing and decreasing the size of the trade as the equity increases and decreases. Buying and holding usually does not use margin, and increasing an existing position would actually fall under the category of pyramiding. So, if you are only buying and holding stocks, this section generally will not apply to you.

Effects of Margin

The incredible effects of money management reflect its ability to achieve geometric growth. To a large degree, the low margin requirements in the commodity and futures markets allow for substantial geometric growth. Because margin is so low in these markets, it really never comes into play. For example, the margin on one corn contract is about $800. I have a corn system where the largest drawdown is about $2,000. According to this drawdown, a conservative Fixed Ratio approach would be to use a delta of $1,000. This means that the potential losses of this situation exceed both the margin requirement and the money management increase requirement. Obviously, if you are only required to have $800 in the account to trade corn but have potential losses of $2,000, you are going to fund the account with more than $2,000. In fact, you must fund the account with the $2,000 plus room for error plus room for the margin should the losses occur. Therefore, it would probably be smart to give this situation at least $4,000. This way, if the drawdown is hit, there is still enough in the account to continue trading. Further, contracts will not be increased until there is an additional $1,000 in the account. Margin never even comes into play in this situation.

Currently, a corn contract is worth approximately $12,000. Suppose that the margin for corn is $6,000. What happens to the account balance required with the example in the previous paragraph? Starting

with $4,000 is not even enough margin to trade that situation. Now add the drawdown plus room for error to the new margin requirements and the proper account balance to trade one contract would be approximately $9,000. According to this starting account balance and money management application, contracts would increase to 2 at $10,000. The problem here is that there is not enough margin to properly increase contracts. We need another $2,000 in the account to have enough margin. This is the same way that margin comes into play when trading stocks. The easiest way around this is to make sure that there is enough money in the account to cover future increases. Instead of starting with $9,000, you would need to start with $20,000 in the account. The following margin schedule shows the proper margin to trade an additional contract in this example. The Fixed Ratio schedule shows a starting account balance of $20,000 with proper increase levels for each contract:

Margin		Fixed Ratio	
$ 6,000	1 contract	$20,000	1 contract
12,000	2 contracts	21,000	2 contracts
18,000	3 contracts	23,000	3 contracts
24,000	4 contracts	26,000	4 contracts
30,000	5 contracts	30,000	5 contracts
36,000	6 contracts	36,000	6 contracts

This beginning account level does not mean that you are risking any more; it does not mean that the effect of money management is any different. It is simply aligning the account balance with the ability to apply money management without ever having to deal with the margin requirements.

In the stock market, if you were to start out trading 100 lots and increase by only 100 lots, you would prepare in a similar fashion. The reason it is similar and not exact is that the margin rate is exactly proportionate to the price of the stock. If the stock is $50 per share, you need at least $25 to trade it. If the price is $100 per share, you need $50 to trade it. Suppose you are trading a $50 per share stock. With that $50 stock, your potential drawdown over the course of several trades is $10. Therefore, you would need approximately $25 for margin plus $10 for drawdown potential. To trade the stock with a little room for error would require about $40. The first increase

would come at $5 according to a conservative Fixed Ratio approach. The problem with this is that you are $5 shor't in margin once the increase occurs. The proper starting account balance would be $75. The following margin schedule shows required margins and the Fixed Ratio schedule shows share increase levels:

Margin		Fixed Ratio	
$ 25	1 share	$ 75	1 share
50	2 shares	80	2 shares
75	3 shares	90	3 shares
100	4 shares	105	4 shares
125	5 shares	125	5 shares
150	6 shares	150	6 shares
175	7 shares	180	7 shares

Starting with $75 in the account to trade one contract allows you to continue to trade without margin ever affecting the geometric growth from the application of the Fixed Ratio trading method.

The math to calculate this is simply:

Margin required/Delta=No. of units at which the deltas required and margin required to increase one additional contract occurs.

Where margin = $25 and delta = $5:

$25/$5 = 5

You then apply the following calculation to determine the starting balance:

First is the total margin for 5 shares:

5 shares x $25 = $125.

Second is the total required to increase to 5 shares using a $5 delta:

(No. of shares x No. of shares) – No. of shares / 2 x Delta = Total dollars required

[($5 x $5) – $5]/ 2 x $5 = $50

You then subtract this amount from the required margin to trade 5 shares and this becomes your starting account balance:

$125-$50=$75

A delta of $6 would be calculated as follows:

$25 / $6 = 4

4x$25=$100

($4 x $4 – $4) / $2 x $4 = $24

$100 – $24 = $76 (the starting balance)

Most traders do not start just trading one share of stock. If you begin trading with 100 lots, you may increase the requirements accordingly. In addition, you do not have to begin increases by 100 lots, you may begin increases by 10 lots or 50 lots if you choose. Whatever you choose, it is best to stick with that number as a unit. Using this method with 10 lot units, you would increase by 10 lots without changing. To do this, you would need to calculate the beginning balance according to the drawdown of trading 100 lots but the increase according to a 10 lot drawdown. If the drawdown was $10 per share, you would have a total drawdown of $1,000 according to the beginning balance but would use a delta of $50 to increase units of 10 lots. Therefore, the following schedules would apply:

Margin		Fixed Ratio	
$2,500	100 shares	$3,000	100 shares
2,750	110 shares	3,050	110 shares
3,000	120 shares	3,150	120 shares
3,250	130 shares	3,300	130 shares
3,500	140 shares	3,500	140 shares
3,750	150 shares	3,750	150 shares
4,000	160 shares	4,050	160 shares

As you can see, you only have to start out with an extra $500 in the account to nullify margin problems while using the same money management concepts as with the commodity and futures markets. You will want to make room for the $1,000 drawdown at the beginning but that does not affect the application of money management since profits are required to increase.

Trading a Basket of Stocks

Trading a basket of stocks follows a similar pattern. For example, if you were trading a basket of 10 stocks and all 10 average out to be about $50 per stock, you would configure the margin requirements and follow the same process. The most conservative way to configure this would be to assume a position in all 10 stocks at the same time. I once applied a system to over 250 different stocks at one time. However, there were usually only about 5 open positions at any given time and never more than 8. As a result, I only needed to calculate margin for a maximum of 10 stocks with a higher average price. Likewise, if it is virtually impossible to be in all 10 stocks at the same time, you may only need to calculate margin for 5 or 6 of them. Nonetheless, we will use all 10 just to be on the ultraconservative side:

5 **x** $25 (margin for average 1 share) = $125

Trading 100 lots of each would require a margin of $12,500.

If the final drawdown was at $15, you would use a delta of $75 to increase from 100 lots to 110 lots. The following schedule would apply:

Margin		Fixed Ratio	
$12,500	100 shares	$18,950	100 shares
13,750	110 shares	19,025	110 shares
15,000	120 shares	19,100	120 shares
16,250	130 shares	19,250	130 shares
17,500	140 shares	19,450	140 shares
18,750	150 shares	19,700	150 shares
20,000	160 shares	20,000	160 shares

The mechanics of the application do not change. You simply must account for the higher margin requirements. Once that is done, everything remains relatively the same.

How to Handle the Different Stock Prices

One of the first questions I hear when discussing money management and stocks is: Why would you want to buy 100 lots of a $10 stock and $100 lots of a $100 stock-why not equalize them? I always offer the same argument I use in the commodity markets. Corn is not the S&P and sugar is not cocoa. They are different. Different is what gives us diversity. If you want to equalize everything, why diversify? If you take everything into account, there is no reason to equalize the prices of the stocks. If you are trading the system on these stocks, the entry and exit rules should be the areas to cover the differences in the volatility. A $10 stock probably has a much smaller chance of suffering the same size drawdown as a $100 stock. If the $10 stock only has a drawdown of $2 and the $100 stock has a drawdown of $15, the two chronologically combined may have a $16 drawdown and cannot have more than a $17 drawdown (provided that the $2 and $15 drawdowns are not individually exceeded). In this situation, you have taken both into account.

This subject is covered extensively in Chapters 8, 9, and 10. Remember, money management is a numbers game. It is not affected by the markets or types of markets, or by the systems and methods that are applied to those markets. Keep this in mind as you read the rest of the book. This fact will be restated many times in the following chapters. The bottom line is that these principles can be applied across the board where markets are leveraged.

7

RATE OF DECREASE

It has been the standard view that at whatever rate capital allocation is increased, capital allocation will be decreased at the same rate. If the account increases the risk at every $10,000 level of the account, those same levels will be used to decrease the allocation. If contracts are increased from 10 to 11 at $100,000 in capital, they will also be decreased from 11 to 10 below the $100,000 level.

Ways to decrease that risk were the first things I started to look at after concluding that fixed fractional trading is too risky. As a result, I developed a strategy which is simply called Rate of Decrease. Basically, the Rate of Decrease is made independent of the rate of increase. Therefore, the levels at which risk is increased will not necessarily be the levels at which the same decreases in risk will occur. There are two basic functions of the Rate-of-Decrease strategy: profit protection and geometric growth enhancement. Maybe a better term for it would be asymmetrical leverage abandonment. In any case, this chapter thoroughly explains both functions. You will see that as a general rule you cannot have your cake and eat it too with this strategy. The decision on what type of risk decrease to use is based either on the goal of protecting profits or increasing the efficiency of geometric growth.

PROTECTING PROFITS

Decreasing risk faster than it was increased will protect profits during drawdowns. A trader might have several reasons for decreasing risk faster than it was increased. First, it can limit the size of

drawdowns. If the strategy or system being traded is prone to suffering large drawdowns, decreasing the risk faster will ensure that the larger the drawdown becomes, the less capital being risked during the drawdown.

Second, it allows the conservative trader to be more aggressive when increasing the rate of reinvestment. The main reason traders are not aggressive with money management is because they fear its effect on the potential drawdown. Decreasing the risk faster instead of at the same level results in a considerably smaller drawdown.

A few negatives can be associated with the faster rate of decrease. These are the trade-offs for the benefits you receive. The biggest drawback to using the faster rate of decrease is that it *increases* the negative effects of asymmetrical leverage. As you decrease risk faster, the ability to gain back those losses also decreases proportionately. If all wins and losses are $1,000 in size per contract and 10 contracts are being traded and contracts are dropped from 10 to 9 through the conventional decrease rate, the required amount of money per contract to make up the last loss increases from $1,000 to $1,111—the decrease caused an 11 percent loss in ability to make up the previous loss. If the number of contracts dropped to 8 instead of 9 due to the faster rate of decrease, the ability to make up the last loss dropped by 25 percent. It now takes a win of $1,250 with 8 contracts to make up the loss of $1,000 that occurred with 10 contracts. Obviously, if the next trade is a losing trade for $1,000, the 8 contracts will lose approximately 1 percent less on the next trade than will the 9 contracts. As the drawdown continues, the percentage lost through the faster rate of decrease will become significantly smaller than the percentage lost through the conventional rate of increase.

The math for finding a new rate of decrease when risk increases at a set level is as follows:

Where CL = Current level
PL = Previous level
X% = Variable percentage

CL − [(CL − PL) x X%] = Next level of decrease

If CL = $275,000 and PL = $225,000:

$275,000 − [($275,000 − $225,000) x 50%]

$275,000 − $25,000 = $250,000 (New level of decrease)

The original level of decrease would have been at $225,000 instead of the new level of $250,000. This will also work just the same with the fixed fractional method. If the level of increase is one contract for every $10,000, then the same equation applies:

If CL = $100,000 and PL = $90,000:

$$\$100,000 - [(\$100,000 - \$90,000) \times 50\%]$$

$$\$100,000 - \$5,000 = \$95,000 \text{ New level of decrease}$$

The following examples illustrate decreasing risk twice as fast as the rate of increase using the Fixed Ratio method with a $1,000 delta on a strategy that will suffer an $8,000 drawdown (very aggressive money management relationship). Table 7.1 first shows the levels of increase starting with an account balance of $20,000. Then it shows the account balance at $80,100, trading 11 contracts, and lists what would happen during the $8,000 drawdown based on the same rate of decrease as the increase rate.

The drawdown suffered in Table 7.1 was an $8,000 drawdown based on trading single units but turned into a $58,000 drawdown due to the aggressive nature of the money management. Keep in mind that it only took $11,000 in profits based on trading a single unit to make it up to the $80,000 level in the first place.

TABLE 7.1 100% Rate of Decrease with Drawdown of $B,OOO

level of Increase	Contract	Level of Decrease	Contract	Drawdown
$20,000–$21,000	1	$80,100	11	($11,000)
21,001–23,000	2	69,100	10	(10,000)
23,001–26,000	3	59,100	9	(9,000)
26,001–30,000	4	50,100	8	(8,000)
30,001–35,000	5	42,100	7	(7,000)
35,001–41,000	6	35,100	6	(6,000)
41,001–48,000	7	29,100	4	(4,000)
48,001–56,000	8	25,100	3	(3,000)
56,001–65,000	9	22,100	2	Drawdown over
65,001–75,000	10			
75.001-86.000	11			

Table 7.2 shows the same Fixed Ratio money management increase levels as Table 7.1; the increase and decrease schedule is for a delta of $1,000 beginning with an account balance of $20,000. However, Table 7.2 has the rate of decrease set at twice the rate at which risk was increased.

Unlike the first scenarios, which gave back almost all profits, the rate of decrease did its job here and protected $16,100 of the profits originally gained. Further, the example with the faster rate of decrease can suffer an *additional* $16,100 drawdown based on a single contract before the account moves back to breakeven. Therefore, the total drawdown of the system being traded can go as high as $24,100 and still not be losing money. This is staying power!

However, the true test is the same situation without any money management at all. Remember that it took just $11,000 based on trading a single unit to punch up to the $80,000 level. Without money management, the account would only have been at $31,000. After the $8,000 drawdown, the account balance would have been at $23,000 without money management. This means that the increased rate of decrease coupled with an aggressive Fixed Ratio still produced 57 percent more profits. After the drawdown, the single contract only produced $3,000 while this combination of the Fixed Ratio method and rate of decrease turned that measly $3,000 into over $16,000!

This is the main benefit of using the faster rate of decrease. However, to get the full picture, we must now see what happens if the

TABLE 7.2 50% Rate of Decrease with $8,000 Drawdown

Level of Increase	Contract	Level of Decrease	Contract	Drawdown
$20,000–$21,000	1	$80,100	11	($11,000)
21,001–23,000	2	69,100	9	(9,000)
23,001–26,000	3	60,100	7	(7,000)
26,001–30,000	4	53,100	6	(6,000)
30,001–35,000	5	47,100	4	(4,000)
35,001–41,000	6	43,100	3	(3,000)
41,001–48,000	7	40,100	2	(2,000)
48,001–56,000	8	38,100	2	(2,000)
56,001–65,000	9	36,100	1	Drawdownover
65,001–75,000	10			
75,001–86,000	11			

$8,000 drawdown is followed by a positive run of $12,000. With the rate of increase and decrease being the same, recall that the account went from $20,000 to $80,100 and then back down to $22,100. The drawdown is now over and a positive run of $12,000 in increments of $1,000 per winning trade is shown in Table 7.3.

The columns on the left show the account size going from $20,000 to $80,100 and back down to $22,100 using the same rate of decrease. The columns on the right show the account going from $20,000 to $80,100 and back down to $36,100 using the faster rate of decrease. In Table 7.3, we reincreased contracts at the same levels as they were decreased. Notice that the same rate of decrease ended up making more than the faster rate of decrease due to the effects of asymmetrical leverage. The difference in the outcome of the example was $112,100 for the same rate of increase and decrease and $104,100 for the faster rate of decrease. This constitutes a loss of $8,000 in profits or slightly more than 7 percent less profits by using the faster rate of decrease. At the end of the drawdown, however, the faster rate of decrease showed a net gain of $14,000, or almost 700 percent more over the same rate of decrease! Not a bad trade-off when the equal emphasis is on protecting profits.

Table 7.4 shows what is called the reincrease switchback. This table shows a more efficient way to reincrease risk after the positive

TABLE 7.3 Re-Increasina after 100% and 50% Rates of Decrease

Account Size	Increment	Amount of Decrease	Account Size	Increment	Amount of Decrease
$ 22,100	2	$ 2,000	$ 36,100	1	$ 1,000
24,100	3	3,000	37,100	2	2,000
27,100	4	4,000	39,100	2	2,000
31,100	5	5,000	41,100	3	3,000
36,100	6	6,000	44,100	3	3,000
42,100	7	7,000	47,100	4	4,000
49,100	8	8,000	51,100	5	5,000
57,100	9	9,000	56,100	7	7,000
66,100	10	10,000	63,100	8	8,000
76,100	11	11,000	71,100	10	10,000
87,100	12	12,000	81,100	11	11,000
99,100	13	13,000	92,100	12	12,000
112,100			104,100		

TABLE 7.4 Reincreased Switchback

Account Size	Increment	Amount of Decrease		Account Size	Increment	Amount of Decrease	
$ 22,100	2	$ 2,000		$ 36,100	1	$ 1.000	
24,100	3	3,000		37,100	2	2,000	
27,100	4	4,000		39,100	2	2,000	
31,100	5	5,000		41,100	3	3,000	
36,100	6	6,000		44,100	3	3,000	
42,100		7,000		47,100	4	4,000	
49,100	8	8,000		51,100	5	5,000	
57,100	9	9,000	(almost even)	56,100	9	9,000	(switch)
66,100	10	10,000		65,100	10	10,000	
76,100	11	11,000		75,100	11	11,000	
87,100	12	12,000		86,100	12	12,000	
99,100	13	13,000		98,100	13	13,000	
112,100				111.100			

run begins. Originally, the reincrease in risk remained at the same levels at which the risk decreased. However, at some point, the original reincrease catches up and passes the reincrease after using the faster decrease rate. The original reincrease had to start from an account balance of only $22,100 and ended up with an account balance of $112,100. The faster decrease started at $36,100, more than the original reincrease, but ended up at only $104,100, less than the original reincrease. The idea behind this strategy is to switch from the increase levels of the faster rate of decrease to the original reincrease levels at the point that the original catches up to the faster rate of decrease.

Notice that this switching method causes the faster rate of decrease to make up $7,000 of the original $8,000 lost due to the effects of asymmetrical leverage. Using the faster rate of decrease gives the performance level high advantage over using the original rate of decrease during aggressive money management strategies. However, a few risks are involved that traders should consider if using the switching method. The reason the lost profits are gained back is because the number of contracts increases from five to nine in one jump. This is great if trading continues on a positive run but if the very next trade becomes a loser, it loses with nine contracts, not seven. You then would have to jump back down to four contracts,

which would increase the effects of asymmetrical leverage all the more. Use caution when applying this method around the levels at which the rate of reincrease is switched.

Also, the drawdown may not always be as large as that shown in the example. After only a $4,000 drawdown, the account levels are very similar. If the drawdown stops after $4,000 and the number of contracts being traded with the original rate of decrease is eight while the faster rate of decrease is only trading six contracts, you cannot use the switching method because you don't know whether the drawdown will continue. If you use this strategy at this level, you are actually not decreasing faster. Therefore, you should only consider it when there is a significant difference in the account sizes before the positive run begins.

INCREASING GEOMETRIC GROWTH (ABANDONING ASYMMETRICAL LEVERAGE)

This is the flip side of using the faster rate of decrease. This strategy can enhance profits significantly if used properly. To illustrate the negative effects of asymmetrical leverage, (and hence the power of abandoning it) we will go back to the coin-flipping example in Chapter 2.

The optimal f of that particular situation was reinvesting 25 percent of the profits on each flip of the coin. By doing so, the amount gained was $36,100 compared with the gain of only $4,700 using 10 percent and the same using 40 percent. Recall also that this function created a bell curve. Anything to the left or right of optimal f did not yield profits as high as optimal f itself. The bell curve exists as a result of asymmetrical leverage. Take asymmetrical leverage out of the picture, and you have an entirely different situation.

Asymmetrical leverage is simply losing a portion of the ability to regain losses. If the number of contracts being traded is two and a loss drops the number of contracts back to one, the ability to regain the loss has decreased by 50 percent. If the loss was $1,000 per contract, the total loss would be $2,000. If the next trade was a winner of $1,000 but with only one contract, another winner of $1,000 is needed to make up the original $1,000 loss suffered with two contracts. The way you get around this is to simply not decrease contracts at all.

Going back to the coin-flipping example, trading 10 percent of the account balance meant multiplying the balance by .10 and risking that amount on the next trade. If the account started with $100, the amount risked on the next trade would be $10. If the trade was a winner, the amount won would be $2 for every $1 risked. If the trade lost the amount lost would only be $1 for every $1 risked. The account would either add the gains or subtract the losses and recalculate for the next trade or flip of the coin. If the next flip was a winner, the account would increase from $100 to $120. The amount to risk on the next trade would be $12. If the following trade were a loser, the account would drop down to $108 and $10.80 would be risked on the next trade or flip of the coin.

Taking away the asymmetrical leverage says that if the account risked $12 on the trade and drops back to $108, the amount risked on the next trade remains at $12. Take the highest figure risked and remain at that figure regardless of decreases in the account balance. This was applied to the coin-flipping method with the 10 percent, 25 percent, and 40 percent fixed fractional increase method as discussed earlier.

By taking asymmetrical leverage out of the equation, the 10 percent reinvestment increased from $4,700 to $11,526 (see Table 7.5). Risking 25 percent on each trade without decreasing raised the amount made from $36,100 to $6,305,843 (see Table 7.6). Notice that the performance is not subject to the bell curve found with asymmetrical leverage. At 40 percent, the profits achieved are not lower than the 25 percent but are at $1,562,059,253 (see Table 7.7). This is the potential power of money management when not affected by asymmetrical leverage. There is one catch, though. These results required that each win be followed by a loss and each loss followed by a win. Using this method and risking 25 percent of the account would require only four losses in a row to wipe the account out. Two losses in a row using $40 (or 40% of initial capital) would make it impossible to maintain a $40 bet on the third flip as there would only be $20 left in the account. This example was for illustration purposes only.

There are ways of implementing at least a variation of this concept in real-life trading, but not with the Fixed Fractional trading. Where drawdowns are big when using the Fixed Fractional method with asymmetrical leverage, they are downright enormous without asymmetrical leverage. Trading 10 percent would leave the account at zero with 10 losing trades in a row. It would render the account useless well before that due to margin requirements.

However, by applying this concept to the Fixed Ratio trading method, you have an entirely new ball game. Recall that the following

TABLE 7.7 (Continued)

Starting Amount	Amount Won	Fractional Increase	Result
10,041,000	2.00	40	8,032,800
23,429,000	(1.00)	40	(9,371,600)
14,057,400	2.00	40	11,245,920
32,800,600	(1.00)	40	(13,120,240)
19,680,360	2.00	40	15,744,288
45,920,840	(1.00)	40	(18,368,336)
27,552,504	2.00	40	22,042,003
64,289,176	(1.00)	40	(25,715,670)
38,573,506	2.00	40	30,858,805
90,004,847	(1.00)	40	(36,001,939)
54,002,908	2.00	40	43,202,326
126,006,785	(1.00)	40	(50,402,714)
75,604,071	2.00	40	60,483,257
176,409,500	(1.00)	40	(70,563,800)
105,845,700	2.00	40	84,676,560
246,973,299	(1.00)	40	(98,789,320)
148,183,980	2.00	40	118,547,184
345,762,619	(1.00)	40	(138,305,048)
207,457,571	2.00	40	165,966,057
484,067,667	(1.00)	40	(193,627,067)
290,440,600	2.00	40	232,352,480
677,694,733	(1.00)	40	(271,077,893)
406,616,840	2.00	40	325,293,472
948,772,627	(1.00)	40	(379,509,051)
569,263,576	2.00	40	455,410,861
1,328,281,678	(1.00)	40	(531,312,671)
796,969,007	2.00	40	637,575,205
1,859,594,349	(1.00)	40	(743,837,739)
1,115,756,609	2.00	40	892,605,287
2,603,432,088	(1.00)	40	(1,041,372,835)
1,562,059,253			

relationship exists between the drawdown, number of contracts being traded, and the delta being implemented:

Expected drawdown = $10,000

Delta = $5,000

Number of contracts being traded = 10

Minimum number of contracts that can be decreased is two.

$10,000 / $5,000 = 2

10 – 2 = 8

To put this in perspective, if the account was at $250,000 trading 10 contracts and a lo-trade losing streak occurred, the account would drop down to $159,000. By not decreasing during the drawdown, the account would drop down to $150,000 instead of $159,000. Therefore the risk only increases by $9,000. The total drawdown would be 40 percent instead of 36.4 percent. If the same $10,000 winning streak occurred, the account would be back at the $250,000 level without asymmetrical leverage. With asymmetrical leverage, it would be at $248,000. Therefore the asymmetrical leverage has a much smaller effect on the ability to regain profits through application of a conservative Fixed Ratio.

SOMEWHERE IN BETWEEN

Thus far, we have discussed decreasing risk faster during drawdowns, decreasing at the same rate of the original increase, and not decreasing at all. In this last section, we discuss decreasing somewhere in between the original rate of increase and not decreasing at all. As mentioned earlier, not decreasing has a much smaller effect on the overall additional risk when applied to the Fixed Ratio method. The reason is the relationship between the delta and the largest possible drawdown. If the delta is a value equal to the size of half of the largest drawdown, then no more than two contracts can be dropped should the largest drawdown be incurred. Should the largest drawdown be exceeded, however, then contracts are free to drop according to how far the drawdown goes.

With this information, traders have a few ways to take advantage of the benefits of not decreasing up to a certain point. For example, a trader may want to stay at the highest number of possible contracts until the drawdown exceeds the largest expected level and then decrease. By applying this method, the trader is waiting to bail out until the last possible minute. This also allows the trader to avoid any asymmetrical leverage for all drawdowns that are smaller than the largest expected drawdown. Then, if that drawdown is exceeded, the trader will protect profits from that point on until the drawdown is over.

Another method I use frequently is to decrease at half the speed that I increased contracts. If the levels of increase are at 10, 20, 30, 40, and 50, once I am over 50, I will not decrease until the account moves back down to 45. The original rate of decrease would have me decreasing at 50, 40, 30, 20, and 10. If I use a delta equal to half the size of the largest expected drawdown, I will not decrease more than one contract at any time as long as that drawdown is not exceeded.

This variation of the rate of decrease accomplishes a slowed asymmetrical leverage effect. There is a situation where asymmetrical leverage can actually turn a $50,000 winning system into a breakeven under the right circumstances. Albeit these circumstances may never occur in the real world of trading, let me illustrate it for you.

Suppose you start with $20,000 in your account and will increase to two contracts at $25,000. At $23,000, you have a winning trade of $2,000 that pushes the account to the $25,000 level. You now trade contracts on the next trade. The next trade is a $1,000 loser, but since you were trading two contracts, the total loss on the trade is $2,000. Now the account is down to $23,000 and you are back to trading one contract. The next trade is a $2,000 winner again and once more, pushes the account to the two-contract level. The next trade is a $1,000 loser but again with two contracts.

Do you see the cycle forming? The previous scenario based on trading a single unit was actually up a total of $2,000. But, because of asymmetrical leverage, the account is at a breakeven. This cycle can theoretically go on forever. However, by applying a rate of decrease slower than the increase, you can avoid this. Instead of decreasing after the first loss, the number of contracts remain at two. The next trade is a $2,000 winner with two contracts and pushes the account to $27,000. Now when the losing trade is incurred, the account only goes down to $25,000, not $23,000. Further, after the losing trade comes another winning trade of $2,000 per contract. This pushes the account

up to $29,000. Progress is slowly being made with this rate of decrease where it would have gone nowhere with the same rate of decrease. On the next few series of trades, the account will move above the three-contract level and then not decrease unless a series of losing trades are suffered.

The rate of decrease can be placed at any variation the trader chooses. It doesn't just have to be a percentage relationship to the rate of increase. It can also be a relationship to consecutive losers or any other type of scenario that sets a pattern for when contracts will be decreased. Although it is best to stick with the mathematical relationships rather than the trade performance relationships, there is no limit to how it can be applied.

8

PORTFOLIOS

Portfolios are one of the most important aspects of any investment venture. This age-old concept has been applied to every facet of investing from mutual funds to real estate. It is as old as money. A portfolio simply means not placing all your eggs in one basket. If you have $100,000 to invest, you don't put the entire amount in IBM stock. Or into another mutual fund. You divide the amount up and place each segment in a different market or type of market sector. The reason for this is best stated in the Bible:

> *Two are better than one; because they have a good reward for their labor. For if they fall, the one will lift up his fellow: but woe to him that is alone when he falleth; for he has not another to help him up.*
>
> Ecclesiastes 4:9-10

Diversification is a way to deal with this potential for failure. You divide the risk so that if one investment fails, the possibility exists for another one to pick up the slack or at least ease the blow.

In the arena of speculative trading whether that be in options, futures, commodities, or stocks, the same principle applies, if not more so. There are brokerage firms out there that will sell a novice trader on one market or another for one reason or another. Heating oil is one of the more popular markets that brokers push during the early fall. The argument is that winter is coming and the demand for heating oil should rise. As the demand for the market rises, so will the price. Because it is a logical, sound argument, people buy the pitch and then end up buying the market. Most brokerages that sell this pitch do so

through options. That way, if for some reason or another, the market moves against the position, the trader's losses are limited to the purchase price of the option. Since the argument is so logical and the risks are absolutely limited, some will open up accounts for $10,000, $50,000, even $100,000+ and buy as many of those options as that money will buy. They are gambling. Not trading a portfolio when it is affordable is nothing but gambling. Some have lost the entire value of their account because the market went against them (and because they didn't implement any money management principles).

In this chapter, we analyze the benefits of creating portfolios in two situations: trading without money management and trading with the Fixed Ratio money management method. Both examples use leveraged instruments. The benefits of trading a portfolio as opposed to a single market or system without application of any money management actually enhance the effects of applying the money management to the portfolio. Market weighting, as discussed in Chapter 9, is a popular strategy with many traders. However, this chapter demonstrates that for the most part, they should not make it a common practice.

TRADING A PORTFOLIO WITHOUT MONEY MANAGEMENT

Reinvestment strategies aside, portfolios are extremely beneficial for several reasons. As already mentioned, the first and most obvious is reduction in risk. A primary goal in creating a portfolio is to be able to stay in the game should one or more of the trading vehicles not perform as expected. Not putting all the available risk capital in one market automatically extends the staying power of any trader. Another goal and benefit of trading multiple markets and/or systems is that it is likely to improve the risk/reward ratio.

For our example for this statement, we will use the coin-flipping example from Chapter 2. However, we will have slightly different rules for one of the coins. The first coin is going to be the quarter market. For the quarter market, every time the coin lands heads up, the player will win $2. Every time the coin lands tails up will yield a $1 loss. The next coin will be the half-dollar market. Every time the coin lands tails up will yield the player a win of $1.50 and every time the coin lands heads up will yield a loss of $1. There will be 100 flips of each coin. The first 100 flips will all be from the quarter market. The second 100 flips will all be from the half-dollar market.

Then, there will be a separate time when each coin is flipped 100 times except this time they will take turns being flipped one right after the other alternating in a 1: 1 even sequence. Just for the record, I am actually flipping the coins to represent real-life action. We will then apply the same examples to the same system in two different markets to show the remarkable resemblance between the effect of combining the actual system and market trades with the coin-flipping examples.

The first flips came from the quarter market. There were 52 tails (losing trades) and 48 heads (winning trades). The net profit was $44 after 100 flips with a drawdown of $12.00. The second set of flips came from the half-dollar market. This set of flips produced 47 tails (winning trades with the half-dollar) and 52 heads (losing trades). The net profit totaled $18.50 with a drawdown of $8.50. By adding the two together, the net profit is $62.50 and by adding the drawdown, the worst case possibility is both drawdowns occurred at the same time would be a total drawdown of $20.50.

Table 8.1 was taken from the Performance I money management program. All quarter trades were on odd days and half-dollar trades were on even days to simulate trading markets alternately. As a result of putting the two markets together, the total drawdown was only $15.00, not $20.50.

The third illustration using these coin flips came from flipping the half-dollar first and then flipping the quarter. The wins and losses of each outcome are the same as the first two examples. Out of 200 flips, there were 50.5 percent winning trades for a total profit of $80.00. Meanwhile, the largest drawdown was only at $9.50. By separating the two markets through the Performance I program, the quarter market alone generated 55 winning trades for $65.00 in profits with a drawdown of $8.00. The half-dollar market produced $15.00 in profits after 46 percent winning trades and a drawdown of $7.50. The drawdown added together totaled $15.50. In both instances, the drawdown was smaller in the combined example.

Now we will apply the same logic to actual markets. The first market is the bond market. The second is the Swiss franc market. The same system is being applied to each market during the same time period. The statistics for each market individually are shown in Table 8.2.

The particular statistics that we need to pay close attention to are the total net profit of each market, winning percentage, and largest drawdown. The total net profit for the bonds came in at

TABLE 8.1 **Random Coin Flip**

Date	Market	W/L	Account Balance
1/1/98	50 cent 1	($1.00)	
1/2/98	quarter 1	(1.00)	(2.00)
1/3/98	50 cent 1	1.50	(0.50)
1/4/98	quarter 1	2.00	1.50
1/5/98	50 cent 1	(1.00)	0.50
1/6/98	quarter 1	(1.00)	(0.50)
117198	50 cent 1	(1.00)	(1.50)
1/8/98	quarter 1	2.00	0.50
1/9/98	50 cent 1	(1.00)	(0.50)
1/10/98	quarter 1	(1.00)	(1.50)
1/11/98	50 cent 1	(1.00)	(2.50)
1/12/98	quarter 1	(1.00)	(3.50)
1/13/98	50 cent 1	1.50	(2.00)
1/14/98	quarter 1	(1.00)	(3.00)
1/15/98	50 cent 1	1.50	(1.50)
1/16/98	quarter 1	(1.00)	(2.50)
1/17/98	50 cent 1	(1.00)	(3.50)
1/18/98	quarter 1	(1.00)	(4.50)
1/19/98	50 cent 1	1.50	(3.00)
1/20/98	quarter 1	2.00	(1.00)
1/21/98	50 cent 1	(1.00)	(2.00)
1/22/98	quarter 1	(1.00)	(3.00)
1/23/98	50 cent 1	(1.00)	(4.00)
1/24/98	quarter 1	(1.00)	(5.00)
1125/98	50 cent 1	(1.00)	(6.00)
1/26/98	quarter 1	(1.00)	(7.00)
1/27/98	50 cent 1	1.50	(5.50)
1/28/98	quarter 1	(1.00)	(6.50)
1/29/98	50 cent 1	(1.00)	(7.50)
1/30/98	quarter 1	(1.001	(8.50)
1131198	50 cent 1	(1.00)	(9.50)
212198	quarter 1	(1.00)	(10.50)
213198	50 cent 1	(1.00)	(11.50)
214198	quarter 1	(1.00)	(12.50)
2/5/98	50 cent 1	1.50	(11.00)
216198	50 cent 1	(1.00)	(12.00)
216198	quarter 1	(1.00)	(13.00)
217198	50 cent 1	1.50	(11.50)
218198	quarter 1	(1.00)	(12.50)
219198	50 cent 1	(1.00)	(13.50)
2/10/98	quarter 1	2.00	(11.50)

(Continued)

TABLE 8.2 System 1 Bonds

Bonds			
Total net profit	$ 41,718	Average winner	$1,167
No. of trades	127	Average loser	$1,200
No. of winners	82	Ratio average trade	.97
No. of losers	45	Average trade W/L/D	$ 328
Winning %	65%	Maximum DD	$5,968
Gross profit	$ 95,750	Profit factor	1.77
Gross loss	$ 54,031		
Swiss Franc			
Total net profit	$ 58,425	Average winner	$ 813
No. of Trades	210	Average loser	$ 814
No. of winners	141	Ratio average trade	1.00
No. of losers	69	Average trade W/L/D	$ 278
Winning %	67%	Maximum DD	$8,125
Gross profit	$114,625	Profit factor	2.04
Gross loss	$ 56,200		

$41,718 and at $58,425 for the Swiss franc. Add the two net profits together and we come up with $100,143. The winning percentage for the bonds came in at 65 percent, while the winning percentage for the Swiss franc was 67 percent. Finally, the drawdowns for each totaled $5,968 for the bonds and $8,125 for the Swiss franc. Add the two together and the combined total drawdown is $14,093.

The risk/reward ratio of net profit to drawdown for the bond market is computed at 6.99. The risk/reward ratio for the Swiss franc is computed at 7.19. Add the two net profits and drawdowns together and we come up with a risk/reward ratio of 7.09. The same number is calculated if you add the 6.99 and the 7.19 and then divide by 2:

$$(6.99 + 7.19) / 2 = 7.09$$

The two market performance records will now be combined chronologically and new statistics formed. This simply means that if the bond system traded every Monday and the Swiss franc system traded every Tuesday, that each bond trade would be followed by a Swiss franc trade and every Swiss franc traded followed by a bond trade. Table 8.3 shows the combined statistics.

TABLE 8.3 Bonds and SF Single Contract Combined Statistics

Total net profit	$100,413	Average winner	$ 943
Number trades	337	Average loser	$ 966
Number winners	223	Ratio average trade	.98
Number losers	114	Average trade W/LID	$ 297
Winning %	66%	Maximum DD	$7,025
Gross profit	$210,375	Profit factor	1.90
Gross loss	$110,231		

Notice that the total net profit remains the same as the two single performance totals being added together. The winning percentage is the average of the two single performance statistics. The drawdown on the other hand is not the two added together, nor is it the two averaged together, but is its own, completely independent statistic. (Although in this case, it is very close to the average of the two single-performance drawdowns. However, there is still no relationship.) This makes the risk/reward ratio increase all the way to 14.26. This is the greatest benefit of creating portfolios.

The reason the drawdown is so much lower than the sum of the two drawdowns added together is because the two single largest drawdowns occurred two years from one another. They did not occur at the same time. The sum of the drawdowns represents the largest possible drawdown between the two and can only occur if they happen simultaneously. Even if they are overlapping, the drawdown will not come to $14,093. It has to be something less than that number.

As a result of this necessity, the more markets and/or systems that are being traded in a portfolio, the less likely that the sum of all the added drawdowns will be suffered. To examine the probability, we will use two coins for our illustration. We will flip each coin twice with the tails up representing the drawdown. Each coin will be flipped at the same time. There are four possible outcomes from the first flip:

1. Coin1 = heads Coin2 = heads
2. Coin1 = heads Coin2 = tails
3. Coin1 = tails Coin2 = heads
4. Coin1 = tails Coin2 = tails

These are the only four possibilities and each has an equal chance at occurring. Therefore, each has a 25 percent chance of happening. If the tails represent the drawdown, then there is only a 25 percent chance of both drawdowns occurring at the same time. If another coin is added to the scenario (i.e., another market), the probability of all three drawdowns occurring at the same time are only 12.5 percent. If all three are flipped at the same time, there are eight possible outcomes:

1. Coin1 = heads Coin2 = heads Coin3 = heads
2. Coin1 = heads Coin2 = tails Coin3 = heads
3. Coin1 = tails Coin2 = heads Coin3 = heads
4. Coin1 = tails Coin2 = tails Coin3 = heads
5. Coin1 = heads Coin2 = heads Coin3 = tails
6. Coin1 = heads Coin2 = tails Coin3 = tails
7. Coin1 = tails Coin2 = heads Coin3 = tails
8. Coin1 = tails Coin2 = tails Coin3 = tails

These are the only eight possibilities and each has an equal chance at occurring. Therefore, each have a 12.5 percent chance of happening. If the tails represent the drawdown, there is only a 12.5 percent chance that all of them will land tails up at the same time. Every coin that is added will cut the percentage probability in half so that by the time you are trading 10 markets, there is less than a $\frac{1}{10}$ of 1 percent chance of all landing tails up at the same time. That is better than 1 in 1,000 odds! Even though the probability that the added sum of the drawdown occurring will continue to diminish, 100 percent of the profits from each market will be added. This means that the risk/reward ratio over the long haul continues to improve.

The previous example was with coins and limited to the drawdowns either happening now or not happening now. In trading, the probability is fractionally smaller with just two markets. When we flipped the coins, we flipped them at the same time and either the drawdown was going to occur or it wasn't. Trading drawdowns are different. Each time the coin is flipped, the coin landing heads up is considered the largest drawdown. With trading, however, the largest drawdown occurs only once (in hypothetical testing). In other words, the test results given for the bonds and the Swiss franc were over a five-year period. If the longest drawdown in each market were to last for three months apiece, then the five-year period would need to be

divided into 20 equal divisions of three months per division. Since the largest drawdown will only occur once, there is a 1 in 20 chance, or 5 percent chance, that it will occur at any given three-month time period. This means that with just two markets over a five-year time period, there are two chances in 40 that they will occur but 1 chance in 400 that they will occur at the same time. The probability is $\frac{1}{4}$ of 1 percent that in any given three-month period, one market will suffer its largest drawdown during the same three-month period as the other market. Add another market to that scenario and the odds are only 1 in 8,000 that all three will occur simultaneously. With four markets, the odds are $\frac{1}{160,000}$, and that factor is a multiple of 20 every time you bring another market into the picture. Meanwhile, 100 percent of the profits are added to the net profit total.

These statistics look pretty promising for portfolio trading. Although this information is all accurate, one other statistic needs to be discussed further to shed more light on the subject. Up to this point, we have only discussed the largest drawdown and that was based on hypothetical back testing. However, one little known statistic that is not revealed by most system vendors is that most systems are in a drawdown of some sort between 60 and 75 percent of the time. This means that only 25 percent to 40 percent of the time is the equity making new equity highs. If we take the adjective "largest" off the word drawdown, it becomes an entirely different scenario.

In the coin-flipping example with three coins, the probability of at least one of them being in a drawdown (or tails) on any given flip is 88.5 percent. The probability of any two of them landing tails up (drawdown) is 50 percent:

1. Coin1 = heads Coin2 = heads Coin3 = heads
2. Coin1 = heads Coin2 = tails Coin3 = heads
3. Coin1 = tails Coin2 = heads Coin3 = heads
4. Coin1 = tails Coin2 = tails Coin3 = heads
5. Coin1 = heads Coin2 = heads Coin3 = tails
6. Coin1 = heads Coin2 = tails Coin3 = tails
7. Coin1 = tails Coin2 = heads Coin3 = tails
8. Coin1 = tails Coin2 = tails Coin3 = tails

Add another market and the percentage goes higher at the same rate it went lower for all of them being in a drawdown at the same time. A fourth market would increase one of the markets being in a

drawdown at any given time to 93.75 percent. The probability of any two of the markets being in a drawdown at the same time is 68.75 percent. The probability of any three of the four being in a drawdown comes to 31.25 percent. That is the rest of the story. You have to remember, though, that the probabilities of one or more of the markets not being in a drawdown at any given time is the same as the probabilities stated for markets that are in drawdowns.

Once again, trading is not coin flipping. As stated earlier, most systems are in drawdowns between 60 and 75 percent of the time (they are not making new equity highs). And lest you think that good systems can't possibly be in drawdowns that much of the time, here is an example of a system in crude oil that was optimized:

Total net profit	= $60,690
Number wins/losses	= 29/54
Winning percentage	= 53.70
Largest drawdown	= $3,750
Average trade	= $1,173
Win/loss ratio	= 3.25

Numbers don't get any better than that. However, the system was making new highs in this market only 35 percent of the time. That means it was in drawdown 65 percent of the time! You say how can that be? A new equity high must come from a winning trade; however, a winning trade does not necessarily have to make a new equity high. Therefore, the maximum amount of time even possible for making new equity highs is equal to the percentage of winning trades. Since a winning trade is not, by definition a new equity high, some winning trades are not going to make new equity highs. There were only 53 percent winning trades meaning that unless every single winning trade also made a new equity high, the maximum time period that the system was making new equity highs could not have exceeded this percentage.

Further, having a higher winning percentage system does not mean that you will have a higher percentage of the trades making new equity highs. As a general rule, the winning percentage is related to the win/loss ratio. The higher the winning percentage, the smaller the average win to average loss will be (there are exceptions to this and there are no set numbers-it is just a general rule). The reasoning behind the rule is that having a higher winning percentage trading method means that profits are taken often while the risk on

a per trade basis remains relatively high. I have an end-of-day system in the S&P that targets a $650 profit but will let the trade move against me by as much as $1,250. Although the winning percentage is 85 percent, it only makes new equity highs 33 percent of the time. The system still makes money; it just takes more winning trades to make up a single loss.

As a result of this single statistic, there are even higher probabilities that one or more markets in any given portfolio are suffering through a drawdown. This information is certainly not placed within this book to discourage you from trading portfolios. It is simply included to give you a full picture of the dynamics of trading with portfolios. The bottom line is that trading with portfolios will increase the long-term risk/reward ratio by a significant sum. Further, money management is not based on the number of drawdowns, but rather the largest drawdown. Therefore, the smaller the largest drawdown, the more efficiently the money management can be applied.

One last caution before moving on. The largest drawdown within a hypothetical testing situation does not mean in any way, shape, or form that this drawdown cannot be exceeded in the future. Further, it is completely impossible for hypothetical results, no matter how profitable, to ensure that the method will generate any amount of net profit over time. Systems are not mathematical certainties. As a general rule, they are math formulas applied to price action trying to capture potential profitable trades in the future. Price action does not have to conform to whatever mathematical parameters were applied to it. Markets change as do the way they move and are traded. Therefore, you cannot rely on these statistics and probabilities to determine absolutes from a performance standpoint.

PORTFOLIOS AND THE FIXED RATIO MONEY MANAGEMENT METHOD

The more you understand the Fixed Ratio money management method, the more you will understand how much drawdowns can affect the final outcome of trading. Potential drawdowns determine how much capital is needed to start as well as how aggressively or conservatively the trader should apply money management to the strategy. The lower the largest expected drawdown, the higher the potential returns after applying money management. The higher the drawdown, the lower the potential returns by applying the Fixed

Ratio money management method. The reason is *the lower the drawdown, the smaller the delta variable can-be in the Fixed Ratio formula.* The smaller the delta variable, the faster the Fixed Ratio method will affect trading. The larger the delta variable, the slower the Fixed Ratio method will affect trading.

This has nothing to do with changing the risk factor of the method. If the largest expected drawdown is $5,000, a 2: 1 ratio of drawdown to delta is $2,500. If the largest expected drawdown is $10,000, a 2 : 1 ratio of drawdown to delta is $5,000. The relationship of the increase levels to the drawdown potential remains the same in both. However, if each make the same amount of net profits, the strategy with the lower delta will make considerably more profits than the method with the larger delta variable.

Also, the more you understand money management and geometric growth in general, the more you will understand that the benefits of applying money management are more visible on the back end than they are on the front end. It is exactly the opposite of the law of diminishing returns. If you had gone without food for days and days and then walked into a burger joint and bought their largest, thickest, everything on it including the kitchen sink, burger for $5.00, the first burger would return the greatest benefit and be the most satisfying. If you were still a little hungry after the first and decided to buy a second, you might not finish the second. Therefore, the second burger was less satisfying and returned a smaller benefit than the first. Of what value would be a third burger? None. With money management, it is exactly the opposite. The first increase will yield the least benefit because it will yield smaller profits. The more risk increases that are experienced, the greater the profits.

Using the math for figuring out levels at which to increase risk, we can determine what the account size will be when the method reaches the 5-contract level using a $5,000 delta:

5 x 5 = 25 / 2 = 12.5

12.5 x $5,000 = $62,500 + Starting account balance of $20,000

= $82,500.

Now calculate the minimum account size to trade 10 contracts:

10 x 10 – 10 / 2 = 45

45 x $5,000 = $225,000 + $20,000 = $245,000.

Now calculate the minimum account size to trade 15 contracts:

15 x 15 – 15 / 2 = 105

105 x $5,000 = $525,000 + $20,000 = $545,000.

Now calculate the minimum account size to trade 20 contracts:

20 x 20 – 20 / 2 = 200

190 x $5,000 = $950,000 + $20,000 = $970,000.

Therefore, 5 contracts to 10 contracts yields $162,500 in profits. The yield for 10 to 15 contracts is $300,000 in additional profits. Finally, 15 to 20 yields $425,000 in additional profits.

If it took exactly the same number of trades and profits based on a single unit to achieve each level, the last set of trades yielded $262,500 more profits than the first set of trades that made the exact same amount on a single-unit basis.

The Three Phases of Money Management

Because of this effect, I have divided the application of money management principles into three phases. The first is the sowing phase. This is when the account is at the minimal level needed to begin trading and apply money management. The account is trading a single unit. During this time, the trader will receive the least benefit from the money management and suffer the greatest effects of asymmetrical leverage. The second phase is the growing phase. This is the phase where the account starts to see significant growth from the application of money management, the effects of asymmetrical leverage are diminishing, and the trader is close to a point of no return. In other words, by applying proper money management, even if the system or method that is being traded goes down the toilet, the trader will still show profits.

The final phase, the harvest phase, is where the trader reaps great rewards from applying proper money management. Asymmetrical leverage is almost nonexistent and not only is the trader to the point of no return, but even if the system being traded fails, significant profits will have been preserved.

Trading the Fixed Ratio method on portfolios tackles two major obstacles. First, since the risk/reward ratio has been vastly improved,

it allows the trader to benefit from the money management sooner. The sooner the money management can increase the risks, the sooner the trader will get past the first sowing phase of trading. Second, profits do not diminish by combining markets and systems and therefore the trader can use the profit potential of several markets or systems to reach the growing and harvest phase of trading.

As a result, the goal with applying the Fixed Ratio method is to apply it to as small a risk/reward ratio as possible. Often, more than one market or system is traded at the same time. The question often arises as to whether the money management should be applied to each individual market or to the markets combined as a portfolio. We have already given the answer but the proof is in the pudding, or results in this case. Since smaller drawdowns allow for more efficient money management results and higher single unit profits bring enhanced money management results in the long run, it is only logical that combining the markets and systems and applying the money management to the combined portfolio as a single entity, is the most efficient application of the money management.

We will begin with the single contract result for the bond and Swiss franc example used earlier (see Table 8.2).

Next, the money management will be applied to the bond market individually and then to the Swiss franc market individually. The delta will be determined by using ½ of the largest drawdown rounded up or down to the nearest $500. This means that for the bond market, a delta of $3,000 will be applied and to the Swiss franc market, a delta of $4,000 will be applied. The results are shown in Table 8.4.

These numbers are based on profits only. There is no starting account balance to these numbers and therefore the risks are based on profits at risk only. The total net profit between the two markets is $636,636 with a total possible $ drawdown of $130,219, which is still only 20 percent of the profits.

TABLE 8.4 Individual Results for Bonds and Swiss Francs

	Bonds	Swiss Franc
Total ending equity	$271,544	$365,092
Total number contracts	14	14
Maximum current percent risk	20%	20%
Maximum current dollar risk	$ 55,144	$ 75,075

TABLE 8.5 Fixed Ratio to Combined Bonds and Swiss Francs

	Combined Results
Total ending equity	$1,327,536
Total number contracts	28
Maximum current percent risk	13.5%
Maximum current dollar risk	$ 129,822

Look again at the previous single contract results for both the bonds and Swiss franc. Notice that the combined drawdown is $7,025, which means the delta is calculated at $3,500 for Fixed Ratio money management purposes. Meanwhile, the total net profits remain the sum of the single market profits added together at $100,143.

The results in Table 8.5 are from applying the Fixed Ratio money management to the combined portfolio.

These results are almost unbelievable. However, the numbers and trades prove that this is the effect of money management when applied to portfolio situations compared with application to single markets and/or systems. Notice that the net profit is more than double, while the dollars being risked are lower than the dollars being risked on the individual market application results. This is the result of reaching the harvest phase of applying money management. Further, these are only two markets in the five-year results.

The number of contracts being traded is listed at 28. This means that 28 contracts are being traded on both markets. If the next signal is a bond trade, 28 contracts are traded. If it is a Swiss franc trade, 28 contracts are traded. If a signal is generated in both markets, then 28 contracts are traded in both markets. Many traders have a difficult time with this concept. The reasoning is that the logical thing to do is to trade 14 contracts in each market. However, that is what each market was trading when the money management was being applied to the single performance records. Further, contracts are increased according to profits in the markets and have already taken into consideration the largest expected drawdown of the combination.

The percentage of profits being risked on the single market application was 20 percent with each market. The percentage being risked *even with trading 28 contracts* on each market is only 13.5 percent. If the total number of contracts were 14 per market, the risk would be 6.75 percent. Portfolios can be a huge tool to increase dramatically the efficiency of the Fixed Ratio trading method.

9

MARKET WEIGHTING

The discussion of portfolios in the previous chapter is a great leadoff into the subject matter of this chapter. What if the two markets in question were the corn and S&P markets? Would each market trade 28 contracts then? Or would the markets be weighted with three or four corn contracts for every S&P contract? Every time I bring this subject up at a seminar, the question is always answered with a resounding "absolutely!" Some participants are determined that it is not even possible to trade the same number of contracts for these two markets. They will argue until their face is blue against all mathematical proof.

The fact of the matter is that we can call the two markets anything we want. From Mars rocks to escargot. If these are the two markets being traded and they produce these kinds of numbers, then the math is the same. There is no difference in what markets produce the profits. This is a numbers game and it needs to be played accordingly. If I made a profit of $500 today, can you tell me which market that $500 was generated from? Neither can the account equity. It is completely independent of what markets and/or strategies are being traded. As a result, everything can be treated equally when applying money management.

However, the following illustration is for those who are still not convinced that you can trade the same number of contracts as the S&P market. We have in our portfolio a system that trades the corn market on a long-term basis. We also have an end-of-day S&P system that exits on the close if a position is entered during the day. The corn system has a drawdown of $5,000, while the S&P system has a

drawdown of $15,000. The combined performance would yield a drawdown between the two markets of $12,000.

According to common weighting practices, the portfolio would trade 3 corn contracts for every S&P contract since the S&P's potential drawdown is three times the size of the corn, thereby "equalizing" the markets. Before applying this type of logic to trading, the question must first be answered: What benefits will come from equalizing the markets? Traders apply this system because it simply "sounds" logical. But what benefits come from equalizing the markets? The only possible benefit is from increasing the profits due to increasing the number of contracts. However, if that were the true goal in making this decision, why equalize? Why not just trade another S&P contract? The logical answer is that if you trade another S&P contract, you will have the potential for $30,000 in drawdown from just the S&P. This is correct. But let's take a look at what happens when you trade one S&P with three corn contracts.

As stated earlier, the drawdown with the S&P and corn methods chronologically combined came to only $12,000. The reason this drawdown is $12,000 and not $20,000 is because the largest drawdown did not occur at the same exact time. However, by adding an additional corn contract, the drawdown from the corn contract must occur at the exact same time as the original corn contract. Therefore, by trading three corn contracts, the drawdown potential from those three contracts is now $15,000, not $5,000. Therefore, the benefit of the noncorrelating drawdowns is severely diminished.

The results in the box are from a system in the S&P that buys or sells on the open and exits at the end of day. The only other exit rule is a protective stop that is placed to keep losses reasonable.

S & P

Total net profit	= $59,212.50
118/203 winning trades	
58% correct	
Win/loss ratio	= 1.45
Average trade	= $291
Largest drawdown	= $9,100

The next set of results come from a longer term trend following systems traded in the corn market.

Corn

Total net profit = $21,925
28/52 winning trades
53% profitable
Win/loss ratio = 2.72
Average trade = $421
Largest drawdown = $2,662.50

The combined results of trading these two systems across the two different markets are shown in the next box.

Combined S&P and Corn

Total net profit = $81,137.50
146/255 winning trades
57% profitable
Win/loss ratio = 1.64
Average trade = $318
Largest drawdown = $8,925

The net profit is simply the two individual market net profits added together. The number of winning trades and losing trades remain the same as well as the average trade and win/loss ratio. However, the largest drawdown is pegged at $8,925, which is lower than the S&P but somewhat higher than corn. The ratio of the S&P single market drawdown to the corn single market drawdown was approximately 3.4, meaning the S&P drawdown was 3.4 times the size of the corn drawdown. Therefore, to equalize the markets, three corn will be traded for every one contract in the S&P. The results (compliments of the Performance I software) are shown in the box at the top of page 139.

By adding two additional corn contracts, the drawdown increased by at least a full contract. Therefore, we lost the benefit of noncorrelating drawdowns of one of those contracts. The reason we did not lose the benefit of both additional contracts is that the main drawdown occurred during the S&P's largest drawdown, not the corn's. There is a 50/50 shot of the largest drawdown occurring during either

Adding Two Corn Contracts

Total net profit = $124,987
146/255 winning trades
57% profitable
Win/loss ratio = 1.8
Average trade = $490
Largest drawdown = $11,325

market's individual largest drawdown. If we had added three contracts to the S&P instead of corn, the results would look as shown in the box that follows.

Adding Three S&P Contracts

Total net profit = $199,562
1461255 winning trades
57% profitable
Win/loss ratio = 1.56
Average trade = $782
Largest drawdown = $24,375

The largest drawdown represents 2.74 times the combined corn and S&P drawdown. We increased the drawdown by 2.74 of the additional two contracts. By trading the S&P alone, the drawdown would have been $27,300. There was a 50/50 chance that this is exactly how adding the corn contracts would have resulted.

According to drawdown and the fact that money management is more efficient with lower drawdowns, the logical thing to do is to trade one corn contract with one S&P contract. If the goal of weighting the markets is to increase potential profits, it would be better to increase those profits by adding a ***different*** market rather than adding an additional contract to an existing market. By doing so, you will increase the net profit of the portfolio as well as your chances that the drawdowns will be noncorrelating. The results in the box at the top of page 140 are from the same system that was applied to the corn being applied to the bonds.

Bonds

Total net profit = $67,781
32/73 winning trades
43% profitable
Win/loss ratio = 3.18
Average trade = $928
Largest drawdown = $6,093

The next box shows results from combining the single contract performances of each corn, bonds, and S&P.

Corn, Bonds, and S&P Combined

Total net profit = $148,918
1781328 winning trades
54% profitable
Win/loss ratio = 1.95
Average trade = $454
Largest drawdown = $9,168

Specifically, this combination should be compared with the combination of trading three corn contracts and one S&P. Notice that the net profit was $24,000 greater while the drawdown was more than $2,000 smaller. This may not seem like a huge amount, but in an arena that has a very small margin of error, it can be quite a bit. Further, the money management results will magnify the differences. By applying the Fixed Ratio method with the delta = to ½ the size of the largest drawdown, the following results occurred, first from the additional corn contracts added to the portfolio and then with the single corn, bond, and S&P contracts (see box on p. 141).

The difference in net profit was over $775,000 within an eight-year testing period. That is like missing out on a salary of about $100,000 a year simply because of an alternative to market weighting. Further, after the drawdown, the three market combination

Three Corn, One S&P with Money Management

Total net profit = $1,113,700
1461255 winning trades
57% profitable
Largest drawdown = $128,175
(11.5% profits)
Maximum number of contracts held = 20

One Corn, One Bond, & One S&P with Money Management

Total net profit = $1,890,175
1781328 winning trades
54% profitable
Largest drawdown = $266,000
(14% of profits)
Maximum number of contracts = 30

would be at $1,624,175 while the three corn, one S&P portfolio would be at $985,000. This is a 60 percent increase in net profits after the drawdown!

Some traders may find this chapter is extremely hard to swallow. The logic doesn't seem to flow with the math and vice versa. However, if you will take a look at the logic from a numbers standpoint, not the market or the historical volatility of the markets, you will see that it makes perfect logical sense. Nonetheless, if you still have trouble, I think the next chapter is for you.

10

MARKET WEIGHTING THROUGH MONEY MANAGEMENT, NOT BEFORE IT

Chapter 9 dealt with an alternative to market weighting before any money management is applied. There is a way of assigning a different weight to markets *through* money management though. This process should not be confused with the one illustrated with S&P contracts and corn in Chapter 9. When money management is applied to portfolios where market weighting already exists, an increase in risk means that the markets that were weighted must increase by the same degree of weighting. When the equity moved past the first level at which risk increased, the number of S&P contracts to be traded moved to two whereas the number of corn contracts had to be increased to six! Therefore, when 20 contracts were being traded in the portfolio, 60 contracts were actually being traded in the corn markets because corn was weighted at 3 contracts per units traded in the S&P. Therefore, when 20 contracts were being traded, it was actually 20 units of 3 contracts per unit in the corn market.

Market weighting through money management is different. Instead, every market starts off with the same number of single contracts. The difference is *the rate at which each market increases* contracts. Through the original way of applying money management, as soon as a level was surpassed in the equity, the risk would be increased across the board regardless of the markets being traded because the drawdown of the combined markets had already been taken into consideration. In other words, the markets were deindividualized. It merely became a numbers game to which the markets that generated

the numbers were completely irrelevant (and rightfully so, as the equity curve cannot discern which markets generated what numbers).

Market weighting through money management attempts to take the individual characteristics of each market and/or system as well as the combined effect of the markets and apply money management to each market according to its own performance while benefiting from the other markets or systems that are being traded. If there are three markets being traded-the bonds, S&P, and corn markets-each has its own performance track record. The only characteristic we will look at on an individual basis is the largest expected drawdown. If the bonds' largest expected drawdown is $8,000 while the S&P's largest expected drawdown is $12,000, and that of the corn is $4,000, then market weighting through money management will apply a different delta to each market. However, it will generate the profits to surpass each increase level from the combination of all three markets.

For example, if the combined drawdown of the three markets were $12,000, the original money management method would increase contracts for all three markets with a $6,000 delta. However, 75 percent of the combined drawdown may be attributed to the S&P, while the bonds and corn markets only made up 25 percent of the drawdown. Therefore, during the drawdown, the S&P is tradingjust as many contracts as the markets that don't contribute to the drawdown to the same degree. As a result, the S&P may increase according to a $6,000 delta, the bonds according to a $4,000 delta, and the corn according to a $2,000 delta. The corn will be the first to increase, then the bonds, and then the S&P. As a matter of fact, the corn will go to three contracts at the same level the S&P goes to two contracts. But, it will not start out with more than one contract in any given market.

The effects of this method should not be confused with equal weighting the markets prior to applying money management. Weighting the markets through money management is not equalizing the markets, but rather applying different weights to the degree of risk each market offers. If one market offers a much smaller degree of risk, we aren't increasing that risk to meet the degree of risk of the other markets; rather, we are allowing the market to increase contracts more efficiently than the markets with greater risk. Therefore, we are equalizing the profit potential of the market according to profits that are generated. Remember, all markets start out with the same number of contracts, and therefore we are not increasing the risk.

There are several things to take into consideration when weighting the market through money management. First, it is a more efficient

form of money management. Because it is allowing certain markets to increase faster than others markets, the effect of geometric growth is an increased acceleration rate. Second, even though it is not equalizing the risk of each market being traded, it increases the drawdown potential slightly. The market that accounts for the bulk of the combined drawdown may be increased at a slower rate and not trading as many contracts as the other markets, but at the time the drawdown occurs, the other markets are trading more contracts. As a result, the increased efficiency allows for the trader to use a more conservative delta across the board. Instead of using a delta of ½ the largest drawdown of each market, the trader may apply a delta equal to ¾ the size of each drawdown. This has the potential of yielding more profits while keeping the drawdown at the same level as the original application of the Fixed Ratio money management method.

Table 10.1 is a fictitious track record trading crude oil, bonds, and the Japanese yen. The dates are fictitious and are only shown to illustrate that all markets are being traded simultaneously. Further, there are no losses in this record and all trades are winning trades of $500. Accordingly, with 18 trades, the net profit of this illustration without any money management is $9,000.

TABLE 10.1 Trade History for 3 Markets

Crude = $300, Bonds = $600, JY = $900

Entry	Exit	Market	P/L*	Account Balance	Contracts
1/1/98	1/1/98	Bonds	$ 500	$ 500	1
1/2/98	1/2/98	**J Y**	**1,000**	**1,500**	2
1/3/98	1/3/98	Crude	1,500	3,000	3
1/4/98	1/4/98	Bonds	1,500	4,500	3
1/5/98	1/5/98	**J Y**	**1,500**	6,000	3
1/6/98	1/6/98	Crude	3,000	9,000	6
1/7/98	1/7/98	Bonds	3,000	12,000	6
1/8/98	1/8/98	JY	2,500	14,500	5
1/9/98	1/9/98	Crude	5,000	**19,500**	**10**
1/10/98	1/10/98	Bonds	4,000	23,500	8
1/11/98	1/11/98	**J Y**	3,500	27,000	7
1112198	1/12/98	Crude	6,500	33,500	13
1/13/98	1/13/98	Bonds	5,500	39,000	11
1/14/98	1/14/98	JY	4,500	43,500	9
1/15/98	1/15/98	Crude	8,500	52,000	17
1/16/98	1/16/98	Bonds	6,500	58,500	13
1/17/98	1/17/98	JY	5,500	64,000	**11**
1/18/98	1/18/98	Crude	10,500	74,500	21

*All trades under the P&L column were $500 based on single contract.

The table shows a different delta being applied to each market using the Fixed Ratio money management method. The delta applied to each market was $300 for the crude, $600 for the bonds, and $900 for the yen. In other words, once the equity rises above $300 (regardless of the market that generated the profits), the crude oil will increase a contract. However, both the bonds and the yen will remain at one contract. If the equity dips below the $300 profit level, then the number of contracts being traded in the crude drops back to one. Two contracts are not traded in the bond market until there is at least $600 in profits. This can come from profits trading two contracts in the crude if necessary. At the $600 level, crude remains at two contracts, the bonds increase to two contracts, and the yen remains at one contract until the equity moves above the $900 level.

For Table 10.1:

Columns 1 and 2 = Entry and exit date of trade

Column 3 = Market trade

Column 4 = Profit of each individual trade (profit is determined by multiplying the number in column 6 by $500. $500 was the amount of the profit from trading just one contract).

Column 5 = Cumulative net account balance

Column 6 = Number of contracts that were traded

For Table 10.2:

Columns 7-9 = Account levels at which each market would increase contracts.

For example, row 7 has in column 10 the number 8. This means that the account minimum required to trade 8 contracts is $8,400 for the crude oil, $16,800 for the bonds and $25,200 for the yen.

Column 10 = Number of contracts to trade at each level (given in column 7 example)

This scenario turned a $9,000 profit record based on trading a single contract into over $74,000! Compare this to simply using a $900 delta for all markets, which decreases the total net profit from $74,500 to only $45,000. The net profit from using a $600 delta on all markets is at $62,500 and a delta of $300 across all markets came to only $111,500. The closest delta across all markets to equal the market weighting effect would be to use a delta across all markets of

TABLE 10.2 Fixed Ratio Reference Table Using the Ratio Efficiently Valued Method

Crude Oil Level[a]	Bonds Level[b]	JY Level[c]	Contracts
$ 300	$ 600	$ 900	2
900	1,800	2,700	3
1,800	3,600	5,400	4
3,000	6,000	9,000	5
4,500	9,000	13,500	6
6,300	12,600	18,900	7
8,400	16,800	25,200	8
10,800	21,600	32,400	9
13,500	27,000	40,500	10
16,500	33,000	49,500	11
19,800	39,600	59,400	12
23,400	46,800	70,200	13
27,300	54,600	81,900	14
31,500	63,000	94,500	15
36,000	72,000	108,000	16
40,800	81,600	122,400	17
45,900	91,800	137,700	18
51,300	102,600	153,900	19
57,000			20
63,000			21
69,300			22
75,900			23
82,800			24
90,000			25

[a] Required equity for crude oil.
[b] Required equity for bonds.
[c] Required equity for Japanese yen.

$475 which would yield a net profit of $77,000 while trading 17 contracts across all markets.

The key here is once again, the potential drawdown. If one market or method has a tendency to produce larger drawdowns, that market may also "hold back" other markets because the delta is based on the inclusion of the unusually large drawdown. By using a set delta across the board of $475, the market that might be responsible for a larger part of a following drawdown if trading 17 contracts instead of only 13 as indicated in Tables 10.1 and 10.2. Therefore, the risk would be slightly higher. Meanwhile, the other markets are increasing contracts faster and are naturally offset in drawdown by the ability to advance from all other markets.

This method will not yield more profits with lower drawdowns every time it is applied. However, based on the logic explained in this chapter, the track record for increased returns should be positive. As a general rule, the geometric growth caused by the implementation of the method should begin sooner because the markets with smaller drawdowns will increase faster than if a single delta were used across the board. This method is available in the most recent upgrade of the Performance I money management software if you want to test it out.

11

OTHER PROFIT PROTECTING MEASURES

In Chapter 2, we briefly discussed several types of money management as well as the characteristics of proper money management and improper money management. I stated that proper money management could (1) be mathematically proven and (2) dealt with both risk and reward issues. The following methods are not considered pure money management techniques because they do fall under these two categories. None of the following can be mathematically proven, and the only issue they attempt to address is the downside. Therefore, you should consider these methods carefully before implementing any of them in your personal trading.

CONSECUTIVE WINNERS/LOSERS

It has been long thought that somehow, someway, consecutive losing or winning trades provided additional opportunities to traders. These opportunities come in all shapes and sizes. The most common belief is that several consecutive losers actually increase the probability of the next trade becoming a winner. Others believe that if a method or system has generated several winning trades in a row, it becomes more probable that a losing trade is about to occur. As a result, they cease taking trades until the method or system suffers at least a few losing trades.

This theory has come from several areas of life, none of which have any mathematical proof as far as trading is concerned. Some

subject areas are valid in these assumptions of consecutive outcomes. However, certain conditions must be present for the theory to hold any mathematical water. This chapter deals with a few areas where the statement is true and why. It then explores the mathematical validity of these beliefs in the trading arena. Finally, the chapter presents possible relationships between markets and this theory. Although there is not any mathematical substance, there are nonetheless some interesting thoughts on how to approach this in a few real trading situations.

I surmise that most of the consecutive winning and/or losing trade theories have made their way into the trading arena from the gambling industry. Gambling is a game of streaks. Any professional gambler will tell you that there is no way to turn the odds in your favor. Therefore, the money management schemes gamblers use come from managing the winning and losing streaks of the method. Earlier in the book, I gave an example of coin flipping and betting where the expectation was negative. There were times that manipulating the bet sizes according to streaks could increase the profits from betting according to those streaks. However, in other instances the outcome was worse as a result of the streaks. I do not profess to be an expert at gambling games and statistics. I do not gamble for the potential to make money from it nor for the sheer fun of it. I am not the kind of person who experiences a "fuzzy feeling" from doing something that is guaranteed to take my money over time. I find nothing exciting about playing a rigged game. Suppose you enjoyed boxing, but were not a professional or even, for that matter, an amateur; you just enjoyed getting into the ring with any other inexperienced boxer who enjoys getting beat upside the head senselessly. Would you enjoy the activity if you were to get into the ring with say . . . Mike Tyson? If the winner of the fight received $25 million, who do you think would win? What would be the probabilities of you winning? This is what I would call a rigged fight. Rigged as in unfair. I wonder what the betting odds would be. Quite honestly, not even knowing who you are, I would unequivocally, without a doubt, put my money on Mike Tyson and call it an extremely safe investment.

Likewise, casinos stake an enormous amount of money on what they consider to be an extremely safe investment. Regardless of my lack of expertise in the subject of gambling games, rules, and statistics, I do know a few things; and they are exactly why I don't chunk coins into those slot machines or play roulette tables. There are no math guarantees in streaks.

THE THEORY OF STREAKS.. .

Streaks in coin flipping are interesting. It is believed that if I were to flip a coin in the air and it were to land heads up six times in a row, that the probability of the coin landing tails up on the seventh flip has increased significantly. The erroneous math support for this comes from dividing the number of flips (including one more) into 100 percent and then subtracting that from 100 percent.

If there are three consecutive tails, the probability of the next flip landing heads up is 75 percent:

$$100\%/4 = 25\%$$

$$100\% - 25\% = 75\%$$

Hence, the more flips, the smaller the number subtracted from 100 percent. With this logic, 100 consecutive flips means that the next flip being opposite is $100/101 = .99$; $100 - .99 = 99.01$ percent chance of the next flip being opposite.

If this were truly the case, we could all get rich at the casinos . . . but it isn't.

We start out by flipping a coin in the air with a 50 percent shot of the coin landing heads up and a 50 percent shot of the coin landing tails up. We flip and the coin lands tails up. The assumption is that since the coin has landed tails up, there is a greater possibility that the next flip will land heads up. The math used to support this is the probability of the next two flips will yield one heads up and one tails up. Since the first was a tails up, the probability of the sequence of the next two will be heads and then tails. The flip is made and tails lands up again. Now the math is 50% x 50% x 50% = 12.5%.

This line of thinking erroneously assumes something that is not in existence: a state of dependence of outcomes. This means that the outcome of the next flip of the coin has some sort of dependence on the outcome of the previous flip of the coin. The definition of dependency is simply an area subject to the rule by an outside power or influence. Independence is an area free from the rule of an outside power or influence. For the number of consecutive outcomes to increase or decrease the probability of a following outcome, dependency has to exist. It does not exist in coin flips. Each coin flip is a completely independent result unrelated or influenced by any number of previous results.

On the surface, this seems impossible. For example, how many would bet that the next flip of the coin is going to be tails if the previous 999,999 flips were all heads? Provided that the coin is not rigged in some way, that it is legitimately 50/50, regardless of the previous 999,999 flips landing heads up, the probability of the next coin landing tails up is and will always be 50/50. The following illustration proves this point.

We will flip a coin two times. No more, no less. There are four possible outcomes of these two flips:

1. Heads, heads
2. Heads, tails
3. Tails, tails
4. Tails, heads

These are the four possible outcomes. Each outcome has an equal chance or probability of occurring. If there are only four possibilities, then each one has a 25 percent chance of occurring.

The first flip lands tails up. There are two possibilities where the first outcome is a tails. As a result, the two possible outcomes where the head is the first outcome are ruled as impossible outcomes. That leaves two possible outcomes. Either the sequence will be tails, tails or tails, heads. In other words, there is a 50/50 chance of the next flip of the coin being heads or tails. The previous outcome did not affect the next probability. This is the rule regardless of the number of flips included in this illustration. If we were to flip the coin four times, there would be 16 possible outcomes of sequences:

1. h, h, h, h
2. t, t, t, t
3. h, h, h, t
4. h, h, t, h
5. h, t, h, h
6. t, h, h, h
7. t, t, t, h
8. t, t, h, t
9. t, h, t, t
10. h, t, t, t
11. h, h, t, t

12. t, t, h, h
13. t, h, t, h
14. h, t, h, t
15. h, t, t, h
16. t, h, h, t

These are the only possible outcomes. Prior to flipping the coin, each possible outcome has an equal 6.25 percent chance of occurring (100/16). As soon as the first flip is through, eight of those possibilities are automatically eliminated. If the first flip of the coin is a tails, it eliminates all possibilities that start with the first flip landing heads up. Therefore, only the following eight possibilities now exist:

1. t, t, t, t
2. t, h, h, h
3. t, t, t, h
4. t, t, h, t
5. t, h, t, t
6. t, t, h, h
7. t, h, h, t
8. t, h, t, h

Each possibility has an equal 12.5 percent chance of occurring (100/8). Four of these eight possibilities have a 12.5 percent chance of landing tails up and four of these possibilities have a 12.5 percent chance of the next flip landing heads up. Therefore, the possibility of the next flip being heads or tails remains at 50/50 (12.5 x 4 = 50). The next flip eliminates four more possibilities. If the next flip lands tails up again, four of the possibilities that remained are immediately eliminated. The remaining four possibilities are:

1. t, t, h, h
2. t, t, t, h
3. t, t, h, t
4. t, t, t, t

Out of the four possible outcomes, two have an equal 25 percent chance of landing heads up while two have an equal 25 percent chance of landing tails up. Therefore, the next flip of the coin has an equal chance of landing heads or tails up. It remains 50/50. The next flip of the coin is a tails again. Therefore, two possibilities remain: t, t, t, h or t, t, t, t. These are the only two possible outcomes, and they have an equal 50 percent chance of occurring simply because the previous trades did not take away or diminish the ability of the following trades to land heads or tails up.

This is why a sequence of 999,999 landing heads or tails up does not increase the probability of the next flip landing heads or tails up. Even with 999,999 landing tails up, there are only two possibilities for the outcome of this 1 million flip sequence, it will either be 999,999 tails and 1 heads or 1,000,000 tails. One or the other and they both have an equal probability of occurring.

INCREASING PROBABILITY WITH DEPENDENCY

Dependency is the flip side of independence (no pun intended). The following illustration shows how dependency does in fact increase probabilities. Suppose we have a deck of 20 cards. In that deck is one ace of clubs. What is the probability that the first card turned over will be that ace of clubs? 1/20 = 5% chance. The first card is flipped over and it is a 10 of diamonds. The card is removed which brings the total cards in the deck down to 19. Therefore, there is now a 5.26315 percent chance that the next card will be the ace of clubs (1/19 = .0526315). The next card is a 2 of hearts. It is removed from the deck and the probability of the next card being the ace of clubs is 5.5555 percent. The next 8 cars are flipped over, none being the ace of clubs. There are now only 10 cards left. One of those 10 cards is the ace of clubs and each has an equal chance of being that card until another is removed from the deck. The chances have increased to 10 percent on the next card. If 8 more cards are taken from the deck and none of them were the ace of clubs, only 2 chances remain. Either the next card is the ace or the card after. Therefore, the probability has increased from 5 percent to 50 percent. If the next card is not the ace, the probability of the last card is 100 percent. The probabilities increased each time a card was removed from the deck. Therefore, the probabilities were dependent on the outcome of the previous cards.

Dependency exists here because each card that was turned over but was not the ace influenced the number of possibilities that remained. This is why card counting is illegal at casinos. (It is legal for them to devise ways to rig the probabilities to take your money

but illegal for you to devise ways to rig the probabilities to take theirs!) If a card was turned and then placed back into the deck and the deck shuffled, the probability would always and forever remain at 5 percent.

In trading, the only possible scenario is the coin-flipping example. If you believe that the math proves an increased probability in winning trades after consecutive losers, simply substitute a winning trade for each tails and a losing trade for each heads. It will come out the same every time.

The question then arises what if the method or system has proven over the long term to be 75 percent accurate in winning trades? What then? The answer is that the same logic applies. Suppose there is a game where we could bet on sets of three flips in a row. The only two sets that we would lose would be the sequence of flips *h, h, h* to *t, t, t*. If the sequence landed any other way, we would win. Remember, there are only eight possible outcomes. Two of those outcomes are losing outcomes while six are winning outcomes (⅜ = 75%). Each time we get through flipping the coin three times, the sequence either wins or loses. After that, the three flips are repeated and all eight possibilities exist again. Therefore, each set of flips has an equal 75 percent chance of producing a winning sequence regardless of the previous outcome of sequences. The logic remains the same.

This leads us into the subject of historical trade records. How dependable are historical track records in accurately relaying to us the probabilities of any given system or method? Much of the time, track records are relied on too heavily in the leveraged trading world. The answer does not lie in the track record itself, but rather the ability of the logic that produces the trades to uncover or isolate a bias in the market(s). If the previous 100 trades had an outcome of 75 percent winners and 25 percent losers, do the numbers themselves give us the probability that the next 100 trades being winners will be 75 percent as well? Here is a shocking statistic that I think most will find eye-popping. Barring any existing bias in the market, there is only a 31.25 percent chance that the next set of 100 trades will be 75 percent winners or better.

You say, "How can that be?" Unless a true bias in the markets comes into play, there are 126 + 30 zeros of possible outcomes of the next 100 trades. There is only one chance that all these 126 + 30 zeros possible outcomes will be winners! As soon as the first trade is a loser, there are zero chances that all 100 trades will be winners. Therefore, at least one possibility is removed. We could do the same

count as before, but that would take up entirely too much time and space, so we will jump to something shorter.

If there are 4 trades, there are 16 possible outcomes. By requiring that 3 out of 4 of those trades be winners, we are eliminating 11 possible outcomes. That leaves only 5 outcomes, or 31.25 percent. To illustrate this, refer to our previous example with the 4 flips of the coin. There are 16 possible outcomes. Total possible outcomes with at least three tails in the sequence (or more) are 5 out of the 16.

This can be figured for any number of trades. Every additional trade doubles the number of possible outcomes. If there is one flip, there are only 2 possible outcomes. If there are two flips, there are 4 possible outcomes. If there are three flips, there are 8 possible outcomes. Each time the flips increase by one, the possible outcomes double in number. That is why there are so many possible sequences for 100 trades. However, no matter how many possible outcomes, the percentage of sequences that will yield 75 percent of the trades winners remain constant. Therefore, there is only a 31.25 percent chance that 75 out of the next 100 trades will be winners barring any market bias.

Compare this with a track record of 100 trades that has only 30 percent winners. Barring any bias in the market that would lead to those statistics, the probability that the next 100 trades will have at least 30 percent winning trades or better is over 89 percent. If we flip a coin in the air six times, there are 64 possible outcomes. To win at least 30 percent of the time, there has to be at least two tails (wins) within the sequence to win 33 percent of the time. Only seven sequences do not have at least two tails (wins): 7/64 (possible outcomes) = 10.9 percent, 100 percent − 10.9 percent = 89 percent. This assumes that there is no bias in the markets influencing the rate of winning trades.

This brings up the question of exactly what is market bias? There are two sides of a cat. If the cat is thrown into the air, what is the probability that the cat will land belly up or back up? Two possibilities exist. If the cat is thrown into the air, it will either land with the back up or belly up (side landings require a rethrow). Because two possibilities exist, is there automatically an equal chance of each possibility? Of course not. There is a bias with this example. If I were a betting person, I would lay my money on the cat landing back up every time regardless of what the preceding statistics show-unless the cat was dead, at which time I would refer to such statistics.

This is an example of a bias in the outcome. The bias is that it must be a law of physics somewhere that live cats land with their feet

on the ground, thus belly down. Biases in the markets are not so easily seen. They can simply exist as more buyers in the market than sellers, or as an imbalance in the supply and demand of a commodity, or as any one or more of innumerable possible catalysts. Therefore, when looking at the track record, instead of seeing a 75 percent winning system and automatically assuming that the next sequence of trades should yield 75 percent winning trades, look at the underlying logic of the method. The numbers themselves will not tell you anything in this area.

DEPENDENCIES IN MARKET RESULTS

In discussing possible dependencies in market results, I want to state up front and very clearly that at best I am skeptical about this theory and only include it for additional thought. There might be (and I stress the word might) a dependency in the outcome of future trades to the outcome of previous trades. No math will ever prove this statement. Only logic and caution can be the ruling guides on this theory.

For dependency to exist, there must be a diminishing of possible losing or winning trades within the next sequence of trades. Like the card-counting illustration, if there are 20 cards and 10 are turned over without turning over the ace, the probability of the next card not being the ace has diminished from 95 percent to only 80 percent. For dependency to exist in the sequence of outcomes in trading, there must be a related (not identical) diminishing of continued losers as a result of market action. For example, as I write this chapter, the heating oil market is very close to 30-year lows. The price of heating oil closed around 36 cents today. The 30-year low is right under 30 cents. Logic would conclude that if a method or system continues to buy heating oil, that eventually, it will stop moving down and actually go up thereby generating a winning trade. The closer to zero heating oil moves, the greater the probability that heating oil has reached its short-term of intermediate-term low. Therefore, buying the market becomes a more probable winning trade than does selling the market.

This example does not really show a dependency in trades but rather a dependency in trade outcomes to market action. It can be proven that dependency does exist in market action. Recall black Monday in 1987. The Dow Jones Industrial Average plummeted

more than 500 points in one day. Today, a 500-point drop would be considered rather large but nowhere near the magnitude that it was back then. The drop represented more than a 20 percent drop in one day. If you go to any chart book, you will see that on the following Tuesday, the market bounced more than 150 points back to the upside. Such a bounce was directly related to and depended on the down move of the previous day. Had the market moved up 10 points on Monday, rest assured, the market would not have moved up 150 points on that Tuesday. Dependency exists in market action because there is knowledge of previous action. Action tomorrow is not free of outside power or influence. That outside power is exactly what moves the markets. The only way some type of dependence can exist in trade sequences is if the dependency in the markets is somehow transferred to the trades that are being taken. This is no easy task to accomplish.

TRADING THE AVERAGE OF THE EQUITY CURVE

Here is a subject with almost as many possibilities as there are beliefs on how it works. Trading the average of the equity curve can assume many shapes and forms. The idea of this method is to take the equity point of the previous 10 days, add them together and divide by 10 (or by any other arbitrary number). This is the average of the equity curve. As a general rule, when the equity is moving up, the average will be under the actual equity. If the equity curve is moving down, the average will normally be above the equity. Therefore, the trader relying on this system only takes trades when the equity curve is above the average of the equity curve and then stops taking trades when the equity moves below that average. Even though no trades are being taken, the trader continues to plot the equity curve and when it moves back above the moving average, the trader resumes taking trades.

This is the most popular use of trading an average of an equity curve. This chapter deals with this method and many more possible methods. It also examines the validity of the method, how it should or should not be used and then offers some other ways to implement the methods.

First, the question must be answered, is trading a moving average of the equity curve a type of money management as defined in this book? Trading an average of the equity curve does not address the

size of the investment being made, which is included in that definition. It addresses ***whether*** the next trade should be taken or not. This is a form of trade selection. Trade selection has no mathematical substance to prove the effectiveness, or for that matter, disprove the effectiveness of the method. Therefore, it cannot be viewed as a true form of money management. And, if not money management, then what. I would classify this method as a form of risk management. The two are not the same. Risk management simply takes steps to attempt to curb risk exposure. Risk management is a safety step. It is an extra step traders can take in addition to money management.

As stated previously, trading the average of an equity curve simply means that if the equity is above the average of the equity curve, trades will be taken. If the equity is below the average equity curve, trades will not be taken. The single purpose in attempting to apply a strategy such as this to trading or investing is to minimize risks. At no time should this method be seen as a profit-enhancing method. This does not mean that it cannot or will not enhance profits; at times, it very well may. This is a side benefit if it happens. Equity curve trading attempts to remove a trader from the risk of large drawdowns, while placing the trader in a position to benefit when the method or system begins to draw back up.

Trading is about one thing: Risk versus reward. There are tradeoffs. A trader risks X dollars to make Y dollars. Before taking the trade, the trader must believe the potential reward is worth the risk. Equity curve trading does exactly the opposite. The risk is the dollars that potentially will not be made while the reward is potentially the dollars that will not be lost. The trader must believe that it is worth risking potential gains to protect existing capital.

To apply average equity curve trading to your account, you must take the X day average of that equity curve and plot it on the same chart as the actual equity curve itself. Figure 11.1 shows an equity curve of a hypothetical track record produced from a system I developed. The actual equity curve is the bold line while the equity curve average is the thinner line that is below the equity curve about 80 percent of the time. The graph below is the equity curve that is produced from taking out the trades immediately following a drop below the average equity curve.

In this example, there are 132 trades without trading according to the average equity curve; 47 percent of these trades were profitable yielding over $61,000 in profits with a largest drawdown of $7,625. After applying a g-point moving average of the equity curve

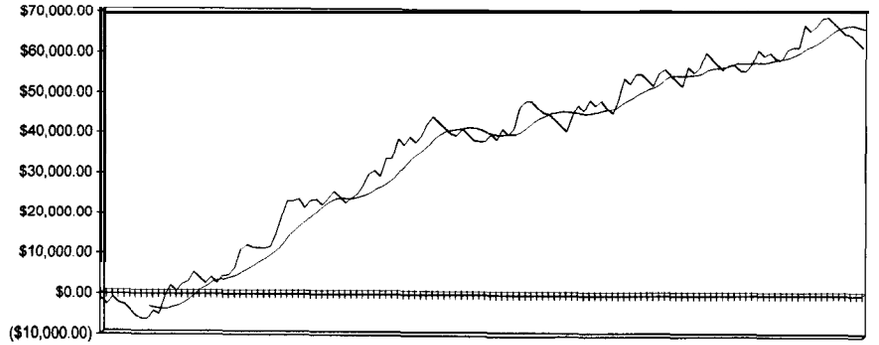

Figure 11.1 The curve that results from taking outthetrades immediately following a drop below the average equity curve.

and taking only trades above the 9-bar moving average, the net profit dwindled down to $39,500 and 105 trades. The winning percentage remained relatively the same but the drawdown was actually over $8,400 . . . more than without trading the average equity curve!

But, before you completely throw in the hat on this method, there was a reason I gave this example. This is one system applied to one market. This is about the worst performance drop you should see on any single system and market. The moving average that was chosen was picked completely out of the blue. There was no optimization whatsoever to this example. I chose it to show that there are risks in trading this method. The risks are not necessarily in what you could lose, but in what you might not make. You will also notice that the method is currently in a drawdown and trades are not being taken. If we were to extend this drawdown, you would see that you are protecting the account from two things that seem to happen when they are least expected. The first thing the account is protected from is complete and total system failure. If the system suffers complete failure, the account will not be partaking in most of the trades that make up that failure. I know of one particular system traded by many clients that would have benefited greatly this year from avoiding a massive $30,000+ drawdown. This would have also protected peace of mind.

The number one reason for business failure is undercapitalization. I would also deem that it is the number one cause of trading failure. Trades are undercapitalized to withstand the large drawdowns that occur with the leveraged trading arena. They may have the capital to withstand it, but the don't have the risk capital to withstand it. By taking the risk for the extended drawdowns away from the account, the capital should have a much longer life span.

ANALYZING THE AVERAGE EQUITY CURVE

Taking a deeper look at trading the average equity curve, problems with the logic of the method begin to arise. In the previous example, the performance record shown actually decreased by trading according to the average of the equity. Table 11.1 is a trade-by-trade breakdown of the original set of 132 trades, the g-point moving average of those trades and then which trades were taken and why. If there is a ">" beside the trade, the following trade was taken because the equity was greater than the average. If there is a "<" beside the trade, the next trade was negated because the equity had dipped below the average. Notice on row 21 the drawdown had extended the equity low enough that the next trade was not taken. Row 22 was a winning trade of $1,718.50. This is the trade that was not taken. As a result of that trade though, the equity curve moved back above the moving average and trading resumed. This happened again on rows 43 and 44. By the time you get to rows 63-72 this same situation seems to repeat itself several times with the equity curve moving above and below the moving average every few trades. Every time the moving average moved below, which signaled the method to stop taking trades, it seemed a winning trade would immediately follow. The equity would move back over and the next trade would be a loser, which would move the equity back below.

This is another reason that this method, as a general rule, cannot be considered as pure money management. There is no dependency in the trades and therefore there is no way of predicting the outcome of the following trades as soon as the equity moves below the moving average. There is a popular notion out there that this type of trading is exactly what will keep you from coming out of the drawdown. It is based on the theory that drawups beget drawdowns and drawdowns beget drawups. If you quit trading as soon as a drawdown really gets moving, you are stopping at the worst possible time. Once again, the

TABLE 11.1 Trade by Trade Breakdown of an Equity Curve

P/L	Account Balance	9 Point Average	< or >	P/L Taken	New Account Balance
$(1,406.25)	$(1,406.25)			$(1,406.25)	$(1,406.25)
(1,406.25)	(2,812.50)			(1,406.25)	(2,812.50)
1,750.00	(1,062.50)			1,750.00	(1,602.50)
(1,406.25)	(2,468.75)			(1,406.25)	(2,468.75)
(468.75)	(2,937.50)			(468.75)	(2,937.50)
(1,406.25)	(4,343.75)			(1,406.25)	(4,343.75)
(1,406.25)	(5,750.00)			(1,406.25)	(5,750.00)
(937.50)	(6,687.50)			(937.50)	(6,687.50)
62.50	(6,625.00)	$(3,788.19)	<	62.50	(6,625.00)
2,125.00	(4,500.00)	(4,131.94)	<	2,656.25	(3,968.75)
(750.00)	(5,250.00)	(4,402.78)	<	(1,406.25)	(5,375.00)
4,406.25	(843.75)	(4,378.47)	>	1,718.75	(3,656.25)
2,656.25	1,812.50	(3,902.78)	>	687.50	(2,968.75)
(1,406.25)	406.25	(3,531.25)	>	2,312.50	(656.25)
1,718.75	2,125.00	(2,812.50)	>	(1,406.25)	(2,062.50)
687.50	2,812.50	(1,861.11)	>	(1,406.25)	(3,468.75)
2,312.50	5,125.00	(548.61)	>	1,562.50	(1,906.25)
(1,406.25)	3,718.75	600.69	>	(1,406.25)	(3,312.50)
(1,406.25)	2,312.50	1,357.64	>	250.00	(3,062.50)
1,562.50	3,875.00	2,371.53	>	1,750.00	(1,312.50)
(1,406.25)	2,468.75	2,739.58	<	4,406.25	3,093.75
1,718.75	4,187.50	3,003.47	>	1,250.00	4,343.75
250.00	4,437.50	3,451.39	>	(687.50)	3,656.25
1,750.00	6,187.50	3,902.78	>	(156.25)	3,500.00
4,406.25	10,593.75	4,767.36	>	0.00	3,500.00
1,250.00	11,843.75	5,513.89	>	343.75	3,843.75
(687.50)	11.156.25	6,340.28	>	3,187.50	7,031.25
(156.25)	11,000.00	7,305.56	>	4,343.75	11,375.00
0.00	11,000.00	8,097.22	>	4,000.00	15,375.00
343.75	11,343.75	9,083.33	>	0.00	15,375.00
3,187.50	14,531.25	10,232.64	>	562.50	15,937.50
4,343.75	18,875.00	11,836.81	>	(2,187.50)	13,750.00
4,000.00	22,875.00	13,690.97	>	1,875.00	15,625.00
0.00	22,875.00	15,055.56	>	218.75	15,843.75
562.50	23,437.50	16,343.75	>	(1,406.25)	14,437.50

(Continued)

TABLE 11.1 (Continued)

P/L	Account Balance	9 Point Average	< or >	P/L Taken	New Account Balance
(2,187.50)	21,250.00	17,465.28	>	1,687.50	16,125.00
1,875.00	23,125.00	18,812.50	>	1,687.50	17,812.50
218.75	23,343.75	20,184.03	>	(1,406.25)	16,406.25
(1,406.25)	21,937.50	21,361.11	>	(1,406.25)	15,000.00
1,687.50	23,625.00	22,371.53	>	968.75	15,968.75
1,687.50	25,312.50	23,086.81	>	2,062.50	18,031.25
(1,406.25)	23,906.25	23,201.39	>	2,906.25	20,937.50
(1,406.25)	22.500.00	23,159.72	<	937.50	21,875.00
1,187.50	23,687.50	23,187.50	>	(1,406.25)	20,468.75
968.75	24,656.25	23,565.97	>	4,437.50	24,906.25
2,062.50	26,718.75	23,965.28	>	0.00	24,906.25
2,906.25	29,625.00	24,663.19	>	4,750.00	29,656.25
937.50	30,562.50	25,621.53	>	(1,406.25)	28,250.00
(1,406.25)	29,156.25	26,236.11	>	2,000.00	30,250.00
4,437.50	33.593.75	27,156.25	>	(1,406.25)	28,843.75
0.00	33.593.75	28,232.64	>	1,718.75	30,562.50
4,750.00	38,343.75	29,993.06	>	2,937.50	33,500.00
(1,406.25)	36,937.50	31,465.28	>	1,812.50	35,312.50
2,000.00	38,937.50	33,052.08	>	(1,406.25)	33,906.25
(1,406.25)	37,531.25	34,253.47	>	(1,406.25)	32,500.00
1,718.75	39,250.00	35,322.92	>	(1,406.25)	31,093.75
2,937.50	42,187.50	36,614.58	>	(1,406.25)	29,687.50
1,812.50	44.000.00	38,263.89	>	(1,406.25)	28,281.25
(1,406.25)	42,593.75	39,263.89	>	(1,406.25)	26,875.00
(1,406.25)	41,187.50	40,107.64	>	1,687.50	28,562.50
(1,406.25)	39,781.25	40,267.36	<	5,437.50	34,000.00
(437.50)	39,343.75	40,534.72	<	1,437.50	35,437.50
1,687.50	41,031.25	40,767.36	>	(31.25)	35,406.25
(1,406.25)	39,625.00	41,000.00	<	(1,625.50)	33,781.25
(1,406.25)	38,218.75	40,885.42	<	(1,406.25)	32,375.00
(281.25)	37,937.50	40,413.19	<	(343.75)	32,031.25
93.75	38,031.25	39,750.00	<	(1,406.25)	30,625.00
1,781.25	39,812.50	39,440.97	>	(1,406.25)	29,218.75
(1,406.25)	38,406.25	39,131.94	<	2,812.50	32,031.25
2,625.00	41,031.25	39,270.83	>	(1.406.25)	30.625.00

TABLE 11.1 (Continued)

P/L	Account Balance	9 Point Average	< or >	P/L Taken	New Account Balance
(1,406.25)	39,625.00	39,302.08	>	1,156.25	31,781.25
1,687.50	41,312.50	39,333.33	>	(1,843.75)	29,937.50
5,437.50	46,750.00	40,125.00	>	(1,406.25)	28,531.25
1,437.50	48,187.50	41,232.64	>	5,093.75	33,625.00
(31.25)	48,156.25	42,368.06	>	(1,406.25)	32,218.75
(1,625.00)	46,531.25	43,312.50	>	2,375.00	34,593.75
(1,406.25)	45,125.00	43,902.78	>	0.00	34,593.75
(343.75)	44,781.25	44,611.11	>	(1,406.25)	33,187.50
(1,406.25)	43,375.00	44,871.53	<	(1,406.25)	31,781.25
(1,406.25)	41,968.75	45,131.94	<	3,156.25	34,937.50
(1,406.25)	40,562.50	45,048.61	<	906.25	35,843.75
3,906.25	44,468.75	44,795.14	<	(1,406.25)	34,437.50
2,656.25	47,125.00	44,677.08	>	(1,406.25)	33,031.25
(1,406.25)	45,718.75	44,406.25	>	(1,406.25)	31,625.00
2,812.50	48,531.25	44,628.47	>	1,250.00	32,875.00
(1,406.25)	47,125.00	44,850.69	>	3,687.50	36,562.50
1,156.25	48,281.25	45,239.58	>	(1,406.25)	35,156.25
(1,843.75)	46,437.50	45,579.86	>	(1,406.25)	33,750.00
(1,406.25)	45,031.25	45,920.14	<	(1,406.25)	32,343.75
3,750.00	48,781.25	46,833.33	>	3,312.50	35,656.25
5,093.75	53,875.00	47,878.47	>	(1,406.25)	34,250.00
(1,406.25)	52,468.75	48,472.22	>	718.75	34,968.75
2,375.00	54,843.75	49,486.11	>	(1,406.25)	33,562.50
0.00	54,843.75	50,187.50	>	(375.00)	33,187.50
(1,406.25)	53,437.50	50,888.89	>	2,531.25	35,718.75
(1,406.25)	52,031.25	51,305.56	>	625.00	36,343.75
3,156.25	55,187.50	52,277.78	>	0.00	36,343.75
906.25	56,093.75	53,506.94	>	5,437.50	41,781.25
(1,406.25)	54,687.50	54,163.19	>	(1,406.25)	40,375.00
(1,406.25)	53,281.25	54,097.22	<	1,187.50	41,562.50
(1,406.25)	51,875.00	54,031.25	<	1,843.75	43,406.25
4,781.25	56,656.25	54,232.64	>	375.00	43,781.25
(1,406.25)	55,250.00	54,277.78	>	(1,406.25)	42,375.00
1,250.00	56,500.00	54,618.06	>	(1,406.25)	40,968.75
3,687.50	60,187.50	55,524.31	>	(1,406.25)	39,562.50

(Continued)

TABLE 11.1 (Continued)

P/L	Account Balance	9 Point Average	4 or >	P/L Taken	New Account Balance
(1,406.25)	58,781.25	55,923.61	>		
(1,406.25)	57,375.00	56,065.97	>		
(1,406.25)	55,968.75	56,208.33	<		
1,218.75	57,187.50	56,642.36	>		
0.00	57,187.50	57,232.64	<		
(1,406.25)	55,781.25	57,135.42	<		
(93.75)	55,687.50	57,184.03	<		
1,906.25	57,593.75	57,305.56	>		
3,312.50	60,906.25	57,385.42	>		
(1,406.25)	59,500.00	57,465.28	>		
718.75	60,218.75	57,781.25	>		
(1,406.25)	58,812.50	58,097.22	>		
(375.00)	58,437.50	58,236.11	>		
2,531.25	60,968.75	58,656.25	>		
625.00	61,593.75	59,302.08	>		
0.00	61,593.75	59,958.33	>		
5,437.50	67,031.25	61,006.94	>		
(1,406.25)	65,625.00	61,531.25	>		
1,187.50	66,812.50	62,343.75	>		
1,843.75	68,656.25	63,281.25	>		
375.00	69,031.25	64,416.67	>		
(1,406.25)	67,625.00	65,437.50	>		
(1,406.25)	66,218.75	66,020.83	>		
(1,406.25)	64,812.50	66,378.47	<		
(187.50)	64,625.00	66,715.28	<		
(1,468.75)	63,156.25	66,284.72	<		
(1,500.00)	61,656.25	65,843.75	<		

motive for using a method like this is not for increased profit potential. Further, there are the instances where the drawdown begets further drawdown.

Despite these problems and arguments, there are a few ways of improving the method. One reason for the problems mentioned here is that the moving average requires that trading stop too soon. The obvious way to correct this problem is to use a longer term moving average. However, this does not resolve another reason for the problems with the method. A moving average is exactly that, a moving average

of past equity points. It lags behind. If the moving average is much longer, the lag could become even more exaggerated. Therefore, the next few methods are efforts to solve these two problems and the arguments that have been mentioned while respecting the reason for using the moving average in the first place.

AVERAGE EQUITY CURVE TRADING WITH A NEGATIVE EXPECTATION

Here is an interesting scenario. Throughout this book, it has been stated that no money management method can turn a negative expectation into a positive one. This is an absolutely true statement. There is no mathematical proof of such a claim. However, that doesn't mean it can't or won't happen. In gambling, the gambler can incur a winning streak and simply stop gambling. That person is a winner. Even though trading with an average equity curve cannot be compared with gambling, in some situations trading this method can produce positive numbers although the system and/or method lost money by taking all the trades. Traders do not get involved in these markets or methods of trading because they expect to lose money-instead, they have a positive expectation. Regardless of how positive their expectation may be, the method or system being used does not always comply. Consider the following trade stream:

100	100
100	100
100	(110)
(110)	(110)
100	100
100	100
100	100
100	100
(110)	(110)
(110)	(110)
100	100
(110)	(110)
100	$500 Total net profit
(110)	

Out of 26 trades, 16 were profitable and 10 were losers. At the end of this run we were up $500. What is the mathematical expectation of this system? At 62 percent profitable and a profit factor of 1.45, it looks to be positive. Wrong! . . . This system is the following; I took a quarter and flipped it 26 times. If it landed heads up, I won $100. If the coin landed tails up, I lost $110. This expectation is negative and will always be negative. However, because of the positive run, we would have been able to walk away winners.

Now . . . for the rest of the story. Had we stuck around for the following 26 flips, we would have had a losing streak that totaled $760 to the downside. Our $500 profit would have reversed to a net loss of ($260). How could we have gotten around this? If we had applied a four-period moving average of the equity curve, the end result of trading only if the equity was above the equity curve would have been a positive $620 with a 65 percent winning percentage. The winning percentage without the curve was only 50 percent. This will not happen every time. Sequence of trades has a lot to do with the outcome of trading the average of the equity curve. However, it does show how a positive streak can be preserved, even in a negative expectation scenario.

TWO CONSECUTIVE CLOSES BELOW THE MOVING AVERAGE

This method requires that the equity curve move below the moving average but also requires a confirmation by having the following equity point close below the moving average. Table 11.2 shows the outcome of applying this method to the same example used in the original average equity curve trading method. By implementing the two consecutive closes rule, we were able to boost back up to the $47,000 profit level while maintaining the same drawdown levels as the previous examples. Further, this additional requirement eliminated fewer trades with a total of 117 trades being taken out of a possible 132.

DOLLAR DRAWDOWN WITH 30 PERCENT RETRACEMENT

This method does not use an average of the equity curve but the logic and reasoning for it are exactly the same. Instead of using a moving average to indicate when to stop taking trades, simply use a set dollar

TABLE 11.2 Average Equity Curve after Two Consecutive Closes

P/L	Account Balance	9 Point Average	< or >	P/L Taken	New Account Balance	
$(1,406.25)	$(1,406.25)			$(1,406.25)	$(1,406.25)	
(1,406.25)	(2,812.50)			(1,406.25)	(2,812.50)	
1,750.00	(1,062.50)			1,750.00	(1,062.50)	
(1,406.25)	(2,468.75)			(1,406.25)	(2,468.75)	
(468.75)	(2,937.50)			(468.75)	(2,937.50)	
(1,406.25)	(4,343.75)			(1,406.25)	(4,343.75)	
(1,406.25)	(5,750.00)			(1,406.25)	(5,750.00)	
(937.50)	(6,687.50)			(937.50)	(6,687.50)	
62.50	(6,625.00)	$(3,788.19)	<	62.50	(6,625.00)	
2,125.00	(4,500.00)	(4,131.94)	<	2,125.00	(4,500.00)	
(750.00)	(5,250.00)	(4,402.78)	<	2,656.25	(1,843.75)	
4,406.25	(843.75)	(4,378.47)	>	(1,406.25)	(3,250.00)	
2,656.25	1,812.50	(3,902.78)	>	1,718.75	(1,531.25)	1
(1,406.25)	406.25	(3,531.25)	>	687.50	(843.75)	1
1,718.75	2,125.00	(2,812.50)	>	2,312.50	1,468.75	1
687.50	2,812.50	(1,861.11)	>	(1,406.25)	62.50	1
2,312.50	5,125.00	(548.61)	>	(1,406.25)	(1,343.75)	1
(1,406.25)	3,718.75	600.69	>	1,562.50	218.75	1
(1,406.25)	2,312.50	1,357.64	>	(1,406.25)	(1,187.50)	1
1,562.50	3,875.00	2,371.53	>	1,718.75	531.25	1
(1,406.25)	2,468.75	2,739.58	<	250.00	781.25	1
1,718.75	4,187.50	3,003.47	>	1,750.00	2,531.25	1
250.00	4,437.50	3,451.39	>	4,406.25	6,937.50	1
1,750.00	6,187.50	3,902.78	>	1,250.00	8,187.50	1
4,406.25	10,593.75	4,767.36	>	(687.50)	7,500.00	1
1,250.00	11,843.75	5,513.89	>	(156.25)	7,343.75	1
(687.50)	11,156.25	6,340.28	>	0.00	7,343.75	1
(156.25)	11,000.00	7,305.56	>	343.75	7,687.50	1
0.00	11,000.00	8,097.22	>	3,187.50	10,875.00	1
343.75	11,343.75	9,083.33	>	4,343.75	15,218.75	1
3,187.50	14,531.25	10,232.64	>	4,000.00	19,218.75	1
4,343.75	18,875.00	11,836.81	>	0.00	19,218.75	1
4,000.00	22,875.00	13,690.97	>	562.50	19,781.25	1
0.00	22,875.00	15,055.56	>	(2,187.50)	17,593.75	1
562.50	23,437.50	16,343.75	>	1,875.00	19,468.75	1
(2,187.50)	21,250.00	17,465.28	>	218.75	19,687.50	1

(Continued)

TABLE 11.2 (Continued)

P/L	Account Balance	9 Point Average	< or >	P/L Taken	New Account Balance	
1,875.00	23,125.00	18,812.50	>	(1,406.25)	18,281.25	1
218.75	23,343.75	20,184.03	>	1,687.50	19,968.75	1
(1,406.25)	21,937.50	21,361.11	>	1,687.50	21,656.25	1
1,687.50	23,625.00	22,371.53	>	(1,406.25)	20,250.00	1
1,687.50	25,312.50	23,086.81	>	(1,406.25)	18,843.75	1
(1,406.25)	23,906.25	23,201.39	>	1,187.50	20,031.25	1
(1,406.25)	22,500.00	23,159.72	<	968.75	21,000.00	1
1,187.50	23,687.50	23,187.50	>	2,062.50	23,062.50	1
968.75	24,656.25	23,565.97	>	2,906.25	25,968.75	1
2,062.50	26,718.75	23,965.28	>	937.50	26,906.25	1
2,906.25	29,625.00	24,663.19	>	(1,406.25)	25,500.00	1
937.50	30,562.50	25,621.53	>	4,437.50	29,937.50	1
(1,406.25)	29,156.25	26,236.11	>	0.00	29,937.50	1
4,437.50	33,593.75	27,156.25	>	4,750.00	34,687.50	1
0.00	33,593.75	28,232.64	>	(1,406.25)	33,281.25	1
4,750.00	38,343.75	29,993.06	>	2,000.00	35,281.25	1
(1,406.25)	36,937.50	31,465.28	>	(1,406.25)	33,875.00	1
2,000.00	38,937.50	33,052.08	>	1,718.75	35,593.75	1
(1,406.25)	37,531.25	34,253.47	>	2,937.50	38,531.25	1
1,718.75	39,250.00	35,322.92	>	1,812.50	40,343.75	1
2,937.50	42,187.50	36,614.58	>	(1,406.25)	38,937.50	1
1,812.50	44,000.00	38,263.89	>	(1,406.25)	37,531.25	1
(1,406.25)	42,593.75	39,263.89	>	(1,406.25)	36,125.00	1
(1,406.25)	41,187.50	40,107.64	>	(437.50)	35,687.50	1
(1,406.25)	39,781.25	40,267.36	<	(1,406.25)	34,281.25	1
(437.50)	39,343.75	40,534.72	<	(1,406.25)	32,875.00	
1,687.50	41,031.25	40,767.36	>	(1,406.25)	31,468.75	1
(1,406.25)	39,625.00	41,000.00	<	2,625.00	34,093.75	1
(1,406.25)	38,218.75	40,885.42	<	(1,406.25)	32,687.50	
281.25	37,937.50	40,413.19	<	1,687.50	34,375.00	
93.75	38,031.25	39,750.00	<	5,437.50	39,812.50	
1,781.25	39,812.50	39,440.97	>	1,437.50	41,250.00	1
(1,406.25)	38,406.25	39,131.94	<	(31.25)	41,218.75	1
2,625.00	41,031.25	39,270.83	>	(1,625.00)	39,593.75	1
(1,406.25)	39,625.00	39,302.08	>	(1,406.25)	38,187.50	1
1,687.50	41,312.50	39,333.33	>	(343.75)	37,843.75	1
5,437.50	46,750.00	40,125.00	>	(1,406.25)	36,437.50	1
1,437.50	48,187.50	41,232.64	>	(1,406.25)	35,031.25	1

TABLE 11.2 (Continued)

P/L	Account Balance	9 Point Average	< or >	P/L Taken	New Account Balance	
(31.25)	48,156.25	42,368.06	>	(1,406.25)	33,625.00	1
(1,625.00)	46,531.25	43,312.50	>	2,812.50	36,437.50	1
(1,406.25)	45,125.00	43,902.78	>	(1,406.25)	35,031.25	1
(343.75)	44,781.25	44,611.11	>	1,156.25	36,187.50	1
(1,406.25)	43,375.00	44,871.53	<	(1,843.75)	34,343.75	1
(1,406.25)	41,968.75	45,131.94	<	(1,406.25)	32,937.50	
(1,406.25)	40,562.50	45,048.61	<	3,750.00	36,687.50	
3,906.25	44,468.75	44,795.14	<	5,093.75	41,781.25	
2,656.25	47,125.00	44,677.08	>	(1,406.25)	40,375.00	1
(1,406.25)	45,718.75	44,406.25	>	2,375.00	42,750.00	1
2,812.50	48,531.25	44,628.47	>	0.00	42,750.00	1
(1,406.25)	47,125.00	44,850.69	>	(1,406.25)	41,343.75	1
1,156.25	48,281.25	45,239.58	>	(1,406.25)	39,937.50	1
(1,843.75)	46,437.50	45,579.86	>	3,156.25	43,093.75	1
(1,406.25)	45,031.25	45,920.14	<	906.25	44,000.00	1
3,750.00	48,781.25	46,833.33	>	(1,406.25)	42,593.75	1
5,093.75	53,875.00	47,878.47	>	(1,406.25)	41,187.50	1
(1,406.25)	52,468.75	48,472.22	>	(1,406.25)	39,781.25	1
2,375.00	54,843.75	49,486.11	>	4,781.25	44,562.50	1
0.00	54,843.75	50,187.50	>	(1,406.25)	43,156.25	1
(1,406.25)	53,437.50	50,888.89	>	1,250.00	44,406.25	1
(1,406.25)	52,031.25	51,305.56	>	3,687.50	48,093.75	1
3,156.25	55,187.50	52,277.78	>	(1,406.25)	46,687.50	1
906.25	56,093.75	53,506.94	>	(1,406.25)	45,281.25	1
(1,406.25)	54,687.50	54,163.19	>	(1,406.25)	43,875.00	1
(1,406.25)	53,281.25	54,097.22	>	1,218.75	45,093.75	1
(1,406.25)	51,875.00	54,031.25	<	0.00	45,093.75	1
4,781.25	56,656.25	54,232.64	>	(1,406.25)	43,687.50	1
(1,406.25)	55,250.00	54,277.78	>	3,312.50	47,000.00	1
1,250.00	56,500.00	54,618.06	>	(1,406.25)	45,593.75	1
3,687.50	60,187.50	55,524.31	>	718.75	46,312.50	1
(1,406.25)	58,781.25	55,923.61	>	(1,406.25)	44,906.25	1
(1,406.25)	57,375.00	56,065.97	>	(375.00)	44,531.25	1
(1,406.25)	55,968.75	56,208.33	<	2,531.25	47,062.50	1
1,218.75	57,187.50	56,642.36	>	625.00	47,687.50	1
0.00	57,187.50	57,232.64	<	0.00	47,687.50	1
(1,406.25)	55,781.25	57,135.42	<	5,437.50	53,125.00	

(Continued)

TABLE 11.2 (Continued)

P/L	Account Balance	9 Point Average	< or >	P/L Taken	New Account Balance	
(93.75)	55,687.50	57,184.03	<	(1,406.25)	51,718.75	
1,906.25	57,593.75	57,305.56	>	1,187.50	52,906.25	1
3,312.50	60,906.25	57,385.42	>	1,843.75	54,750.00	1
(1,406.25)	59,500.00	57,465.28	>	375.00	55,125.00	1
718.75	60,218.75	57,781.25	>	(1,406.25)	53,718.75	1
(1,406.25)	58,812.50	58,097.22	>	(1,406.25)	52,312.50	1
(375.00)	58,437.50	58,236.11	>	(1,406.25)	50,906.25	1
2,531.25	60,968.75	58,656.25	>			1
625.00	61,593.75	59,302.08	>			1
0.00	61,593.75	59,958.33	>			1
5,437.50	67,031.25	61,006.94	>			1
(1,406.25)	65,625.00	61,531.25	>			1
1,187.50	66,812.50	62,343.75	>			1
1,843.75	68,656.25	63,281.25	>			1
375.00	69,031.25	64,416.67	>			1
(1,406.25)	67,625.00	65,437.50	>			1
(1,406.25)	66,218.75	66,020.83	>			1
(1,406.25)	64,812.50	66,378.47	<			1
(187.50)	64,625.00	66,715.28	<			
(1,468.75)	63,156.25	66,284.72	<			
(1,500.00)	61,656.25	65,843.75	<			

amount for the drawdown to exceed. After the drawdown exceeds this level and trades have ceased, require that the dollar size of the drawdown be retracted by 30 percent before starting to take trades again. For example, if the largest hypothetical drawdown was $8,000, we could set a rule that states once the drawdown surpasses $9,000 we will stop taking trades. If the drawdown goes to $12,000 and then begins to come back up by 30 percent, we will begin taking trades again. This means the drawdown would have to decrease from $12,000 to $8 400. Whatever the $ amount used for this method, it should be at least the size of the hypothetical track record.

The same example of the bond trade with this method applied never stopped taking trades and therefore maintained the full $61,000 in profits and will still be out of the market long before the drawdown goes to $20,000 or even more.

TREND LINES AND THE EQUITY CURVE

Using trend lines on the equity curve is another way of cutting the larger losing streaks of any method or system down to size. Trend lines can be used with the equity curve by drawing a line between the two most recent low points of the equity and extending it into the future. If the equity breaks the line, trading is halted. Once the equity moves back above the line, a new line is extended into the future and the cycle starts all over. This can be coupled with the required two consecutive closes below the line requirement as well.

From the previous illustrations, there are many potential tools to help the overall performance record of our trading. However, the illustrations and methods in this chapter cannot be proven to mathematically increase that performance. There are instances where application of some of these strategies will keep us from being blown out of the markets during unexpected drawdowns and trading failures. Based on the logic, it is best to use these strategies for that purpose alone.

12

RISK OF RUIN

I hesitate even to bring up this subject in a book that is focused on providing practical money management knowledge and applications. I often receive calls from wannabe know-it-alls who will discuss a method so intelligently and then bring up the subject of risk of ruin. Basically, my reaction is "who cares!" Risk of ruin has absolutely zero practical application in trading. Running through the calculations to determine the risk of ruin on any particular method is also completely useless. Unlike most other applications contained in this book, there is no call to action with the risk of ruin. It just "is." It is a statistic that is there. There is a statistic for just about every possible dotted "i" and crossed "t" in the realm of trading. Most are useless. We might look at them and say, wow, I didn't know that. But beyond enticing a wow from us, they have no further value. Such is the case with risk of ruin.

So, if it is worthless as a statistic, then why even mention it in the book? My purpose is to convince you that you should not devote any time or energy to this risk. By devoting this portion of the book to it, I hope to correct some misunderstandings of the subject. I hope to save those who are stat heads some valuable time in the future. For those of you who have never heard of risk of ruin, you might do yourself good not even to read this chapter. However, I am quite sure curiosity won't let you do that.

The definition of risk of ruin is the probability that the account will draw down to a state where no further trading can take place. An example is trading a $5,000 account in the bond market that has a margin requirement of $3,000 per contract. If the $5,000 account draws down to below $3,000, the account is ruined and trading the

bond market must cease. The risk-of-ruin calculations take into consideration the sequence of wins and losses as they occur and recalculate the risk of ruin based on the sum of those wins and losses. The greater the account over the $3,000 margin requirement, the lower the risk of ruin. (This is a rough example, but it is as close to practical as we will get.)

The only place I have seen an extensive discussion on this subject is in Ralph Vince's book *Portfolio Management Formulas.* If for some reason, the reader wants to grasp the math behind this statistic, I suggest going to that book. The present chapter uses only the most simple math examples to generally illustrate how risk of ruin works and why it is useless. To illustrate what risk of ruin is, we will refer back to the illustration of the coin-flipping game where we risked 25 percent of the entire $100 stake without decreasing the size of the next bet after a losing flip. That example had us risking $25 on the next four flips regardless of winning or losing. For our $100 account to be ruined (i.e., left with nothing else to bet or for that matter be rendered so low that we are unable to continue betting), we would have to lose four times in a row.

We can easily calculate the risk of ruin in this scenario. For the first three trades, the risk of ruin is zero. It is impossible, assuming that the numbers and rules cannot be altered, that we draw the account down so far that we cannot take the fourth trade. However, once we take into account the possibility of the fourth trade, the risk of ruin becomes 6.25 percent for the next four trades. Starting with $100 in the account, prior to making any bets, there are 16 possible combinations of wins and losses. However, only one possible combination will render the account ruined. That combination is: Loss, Loss, Loss, Loss.

Any other combination of wins and losses will not render the account ruined. Therefore, our risk of ruin, prior to betting, is 6.25 percent. (1/16 = .0625) However, something interesting happens; this risk of ruin can never get any smaller with this situation. Even if the betting yields 100 wins in a row, the fact that 25 percent of the account is being bet without a $ decrease during losing trades will never take the account away from the possibility of being ruined on the next four flips of the coin. Further, as soon as one losing flip is incurred, the risk of ruin immediately jumps to 12.5 percent because there are only eight possible outcomes of the next three flips. Only one of those outcomes can render the account ruined: Loss, Loss, Loss. No other outcome will render the account ruined within the next three trades.

If the second trade is a loss, the risk of ruin immediately jumps to 25 percent. If the third trade is a loss, there is a 50 percent chance that the next trade will be a losing trade and therefore a ruined account. If there are three trades in a row that are losers and the fourth trade is a winner, it will not start the process all over. Instead, since total risk of ruin can always occur within four flips of the coin in this situation, it simply drops the fifth trade back off the record and replaces it with the win. In this situation, the trade scenario is as follows: Loss, Loss, Loss, Win.

Recall that every time we lost, we lost $1 for every $1 being bet, but we won $2 for every $1 being bet on winning flips. If the preceding sequence were the outcome of the first four flips of the coin, our account would have gone from $100 to $75 to $50 to $25 and then back up to $75 after the winning trade. Since 25 percent of $75 is less than the original $25 we started to bet with (no decrease), our next bet is still going to be $25. Therefore, our risk of ruin drops back to 12.5 percent over the next three trades (i.e., it would only take three losers in a row to render the account ruined).

This scenario does not give you a good understanding of the whole picture, though. The more trades you take into consideration, the higher the probability of ruin becomes. In the example, we came across another scenario that would render the account ruined by taking in a sequence of seven trades instead of four: Loss, Loss, Loss, Win, Loss, Loss, Loss. This scenario would render the account ruined. The account would go from $100 to 0:

$100
75
50
25
75
50
25
0

In fact, the more trades that are taken into consideration, the more probable it is for risk of ruin. Taking into consideration six trades instead of only four, prior to any of those trades being taken, the probability of ruin increases from 6.25 percent to 9.375 percent.

At seven trades, the probability moves to 12.5 percent and includes the additional sequence besides the four losses in a row that will yield the account ruined.

I used this example because it is not a real-life option for real-life traders. The reason it is not a real-life option for traders is that the real risk of ruin is real great. How many needed to see the risk-of-ruin numbers to decide not to trade this ludicrous scenario?

If a trader applying the risk of ruin to trading places the account where there is anything but an absolute fraction of a fraction of a chance that the account will go into a ruinous state, the account is too small. This is the only use for the risk of ruin and it is not the stat but whether it even exists within the confines of trading. It did not take a genius to figure out that trading a bond system where the margin is $3,000 with a $5,000 account places the account at risk to ruin in 99.9 percent of the situations.

The question then arises, what if a trader has only $5,000 to trade with. What then? Isn't the risk-of-ruin calculation important to better determine which method or markets to trade in that situation? In theory, maybe. However, there is one thing wrong with the entire risk-of-ruin calculation. It truly has no effect on future trading. You can run the risk-of-ruin calculation on a particular situation and come up with a risk of ruin of say, 28 percent. Then, you can run the risk of ruin on another situation and calculate a 23 percent risk-of-ruin probability. Which one will you decide to trade? It is obvious isn't it? The 23 percent risk-of-ruin situation should be the one. So you start trading and as soon as you start trading, the thing goes into a drawdown and you are ruined. Meanwhile, the method with the 28 percent calculation went on a nice run and would have lowered the risk of ruin to only 10 percent because of the increased capital in the account.

In this scenario, the risk-of-ruin calculation didn't help you at all because the calculation can only take into consideration past trades. It is somewhat like optimization (see Chapter 14) or optimal f (see Chapter 5). The whole calculation is based on past data. One small deviation from that past data and the calculations are way off. Further, the calculation is taking into account a long history of past trades. If you were to take the worst year of trade statistics instead of the entire history, you might find that the risk of ruin for those statistics was 50 percent for your current situation now. Bottom line when dealing with these types of numbers is that it is all a gamble. Traders will do far better using a little common sense and logic when looking at trading methods with small accounts.

On a side note, my suggestion for small accounts would be to stick to trades that, in and of themselves, have a high probability of making money. This does not involve system trading. It involves disparity in certain market situations. It involves unique opportunities that don't come up often. For example, in January 1997, the price of platinum came down and actually dipped below the price of gold. Without getting into the fundamentals of this opportunity, suffice it to say this is a rare thing. Platinum trades at an average of $50 to $100 per ounce more than gold. To take advantage of this, you simply buy platinum and sell the gold (actually, you buy 2 platinum as it only trades in 50 oz. contracts compared with 100 oz. contracts for gold).

There are other rare opportunities like this that small accounts can trade with little risk and high probability of winning as well as profit opportunity. I certainly don't need a risk-of-ruin calculation comparison when trying to decide to take trades like this or to trade an overnight bond system with a drawdown of $3,000 in a $5,000 account. A little common sense and logic will carry you farther than the risk-of-ruin calculations.

13

THE SYSTEM

Thus far, we have thoroughly covered several practical, as well as impractical money management methods for leveraged trading. These methods can be used on any market where the amount of money required to make the trade is less than the value of the market being traded. However, without the method or system to trade these leveraged instruments, all the money management in the world will do no good. It is like the carriage without the horse, the pool table without the balls, the roof without the house. They all serve their purpose well, but only with the companion object. The money management without the method, system, or market to trade, is for all practical intents and purposes, useless.

Most believe that the system or method being traded can be self-sufficient. That a trader can have the system without necessarily having money management. Over the past 10 years, systems and methods have been thrust into the mainstream of trading importance while proper money management has been grossly ignored. Part of this problem is that we now live in a "gotta have it now" society and have become a materialistic country. So much so that people are willing to give up what is right for the sake of convenience or personal gain, as evidenced by the scandal in the White House. Despite President Clinton's reprehensible behavior, polls show that Americans believe that we should stay out of his private life. Why? Because the economy is good. I guarantee that if we were in the days of high unemployment and soaring interest rates, voters would be less forgiving. Of course, the President's private life and character have nothing to do with anything. It is all about money.

Likewise, many people are interested in getting into the markets because they have heard that leveraged markets can make them rich.

They want to pursue this goal while investing as little money and research as possible. More research and learning takes time. In the gotta have it all now society, time is exactly what will not be tolerated. Therefore, they take what the industry has offered as the way to wealth: systems, methods, indicators, oscillators, the alignment of the moon and stars, and the list goes on. Meanwhile, they completely ignore the key to long-term successful trading. Money management. Rest assured though, if they stick around long enough, they will learn. I did.

Just as money management needs the method or system; the method or system needs money management.

The purpose of this chapter is not to give actual systems or methods the trader can begin using immediately. There are more books and learning materials for that subject than there are traders. The focus of this chapter is to change the popular view in the industry and show that long-term success can be attained with simple, logical, mediocre systems and methods. The common term to describe that system or method out there that will achieve the greatest success is the Holy Grail. It is a futile search. A system that rarely loses with extremely small drawdowns and could never possibly falter is what many traders spend long hours looking for. And, these are usually the traders who got involved in the markets with wide-eyed, unrealistic dreams of getting rich quick with no risk. And, if you are wondering why I know so much about these traders, it is because I once was one of them. I saw the potential of the markets and closed my eyes to the true risks. I also paid the price, many times over. I also was the trader looking for the Holy Grail. Oh, it was promised on many occasions, but it was never delivered. I have, through much experience and much research, come to the conclusion that the trader's Holy Grail (1) does not exist; and (2) is not needed.

There are two rules that I use when trying to determine whether a system should be traded or not. As I look for methods to trade, I am always thinking of how the money management is going to affect the statistics that any particular system or method has produced historically. Therefore, I first look at the robustness of the statistics. Next, I look at what is producing those statistics. When I trade, I must have confidence in the method, especially when the drawdowns come around. I must have confidence that the logic behind the system will eventually prevail. After we take a closer look at these two rules, I give a few extremely simple and logical methods to prove that the conclusions made earlier about the Holy Grail are in fact true.

ROBUST STATISTICS

The statistics are the very first thing I look at before going any further with the system or method. How much money did the method make over what period of time? How many times has the method traded in the past 10 years? What was the win/loss ratio compared with the winning percentage? What kind of drawdown was there and is it realistic? These are a few of the statistics that we will look at specifically. The reason I look at statistics before the logic is because I have developed and tested many logical methods that were losers. I carried a perfectly sensible logic into my trading and was dead wrong. Quite often our preconceived ideas of what works and what doesn't work are way off. I will never forget my introduction into the world of futures options. It was about the middle of October, winter was around the corner, and I was trying to put myself through college while supporting a wife and child. I had been hired to completely strip, sand, and paint the outside of a house and was listening to the radio as I labored at this task when a perfectly logical argument for buying heating oil came over the air. Demand. That's all. During the winter, there is a greater demand for heating oil. By purchasing heating oil options, I could keep my risk set and have unlimited profit potential. I was familiar and comfortable with trading options from my experience of trading stock options. So, I opened a measly $2,500 account and bought as many options on bonds as I could afford (or some other market besides heating oil, I don't remember what market). It was the old bait-and-switch routine. They had convinced me to open the account based on the heating oil but convinced me on another trade after they had my money. I was sold because of the logic I had heard.

The part of the logic I neither heard, nor investigated, was that heating oil was already trading rather high at the time. This is the part of the logic I missed on the radio. Likewise, we often think that a certain method is completely logical in nature and are sold on one part of the logic but fail to see or ignore other factors influencing that logic. This is why I look at the statistics first. If the statistics aren't there, who cares about the logic. It is most likely wrong. My point? Heating oil went down that year, and I didn't make money with the options I bought either.

Certain statistics have more value than others. Certain statistics also have value in different areas than others. Therefore, it is better to look at a basket of statistics instead of just two or three.

The following sections describe statistics that I look at, what I look for, and why. These are not listed in any order of importance as it is hard to rank any individual statistic outside its relationship to one or more other statistics.

Total Net Profit

This statistic is the gross profits minus the gross losses. It will give you the broadest view of what the system or method can do. The total net profit is of little value until it is broken down by the number of years or time period it took to build. For example, rarely does a system in the bond market produce more than $5,000 to $8,000 per contract in any given year. Therefore, if the system only made $20,000 in the past 10 years, that boils down to $2,000 per year. This is obviously below average. Before passing final judgment, other statistics need to be taken into consideration.

Maximum Drawdown

There have been disputes over the definition of a drawdown. This is the correct definition: the distance between a high point in equity followed by a lowest point in equity until a new high is made. In other words, if the current equity is at $50,000 but was at an all-time high of $60,000 a few weeks ago, then the method is currently in a $10,000 drawdown. This drawdown will last until the previous equity high of $60,000 is surpassed. If the equity does not go below $50,000 before achieving a new equity high, then this will be counted as a $10,000 drawdown. If the system previously had an equity high of $20,000 and the equity dropped to $8,000 before moving higher, then the $12,000 is the largest drawdown, not the current $10,000.

This number is not the most useful number in the world. First of all, there may have been four or five drawdowns that were close to the $10,000 level thereby showing consistent larger drawdowns. Or, all other drawdowns may have been less than $3,000 showing that the $10,000 drawdown is not a regular occurrence. Further, just because a drawdown is $10,000 does not mean that somehow, magically, it will not exceed that number in the future. Drawdowns do not know that they are supposed to stop at any given point. They do not even know whether they are currently in a $1,000 drawdown or a $100,000 drawdown. Nonetheless, it helps in making an educated guess on what to expect when gauging the overall risk of a method.

I have read from some who say a good way to gauge this statistic is to divide it into the net profit. If it comes to less than 10 percent of the net profit, it is probably a very good system. I wholeheartedly disagree. If a system is tested for 2 years with a net profit of $20,000 and a drawdown of $10,000, according to this logic, this method really stinks. However, if it is tested for 10 years and produces $100,000 but never exceeds the $10,000 drawdown, then it is considered a good system. The problem here is that I can throw enough time to keep the profits going higher in order to bring this number into compliance. Just because I tested it for a lo-year period did not change the system from bad to good. What if that drawdown occurs right after you start trading? What is the ratio then? If you haven't made any profits, it is infinite. A better ratio to use is the average drawdown to the average yearly profit, which is discussed with the statistic of the average drawdown.

Mathematical Outcome (Expectation)

This statistic was covered in Chapter 2 under the topic of positive and negative mathematical expectations. When used to gauge the strength of a historical track record, it cannot be used as an expectation since the probabilities never remain constant for future trades. However, it can give you the strength of the performance record to compare with others. I generally do not like to see anything under .6 when trading. Remember, the greater the number, the more robust the track record. The lower the number (under zero), the more negative the outcome.

For reference, the following equation is used to determine the mathematical outcome:

[1 + (Average win/Average loss)] x Winning percentage - 1

Average Trade

This is the take-home statistic. The average trade is simply the total net profit divided by the total number of trades taken. Therefore, every time you make a trade, on average, this is what you will take home. The best use for this statistic is to gauge how much margin of error you have. If a system makes $100,000 in five years but does so over the course of 1,000 trades, the average trade is only $100. In a market such as the S&P, $100 is 4 whole ticks! You can be looking at

the screen and turn around doing the hokeypokey and the market has moved 4 ticks on you. Not much margin for error here. Take out commission and slippage and you will probably lose money. Therefore, the higher the average trade, the more room for error. I generally don't even consider a method or system that does not give me at least $250 an average trade.

Average Win/Loss Ratio and Percent Profitable

These two statistics add little value, if any, by themselves. When taken together, however, they can be very valuable. If I were to rank a statistic, this combination would probably come out on top. In fact, if I could see only one thing and nothing else to make my decisions, it would be this. The essence of system trading is in the numbers game. Like the average trade, the combination of these two statistics helps you gauge room for error. They also tell you quite a bit about the logic

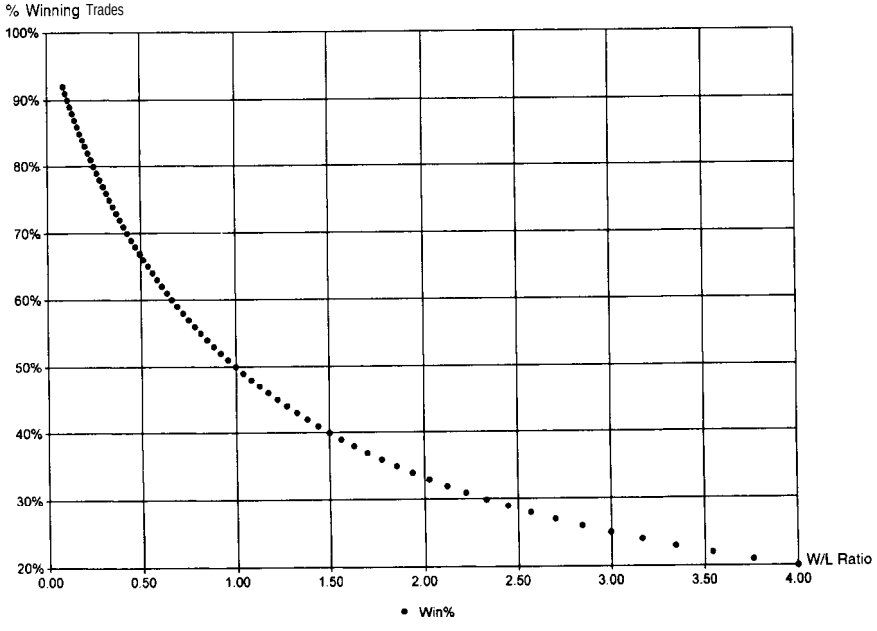

Figure 13.1 Win/loss ratio.

of the method being traded as well. The starting point of this combination is illustrated in Figure 13.1. To quickly summarize, any time a system or method is 50 percent correct with a win/loss average of 1.00, it is a breakeven situation. If the method is 50 percent, the average win/loss ratio must be greater than 1.00 (after commission and slippage have been subtracted). The higher the winning percentage, the lower the win/loss ratio has to be to break even. The lower the winning percentage, the higher the win/loss ratio has to be to break even. At 20 percent profitable, the win/loss ratio has to be a whopping 4 to 1 or 4.00 just to break even. At 80 percent, the win/loss ratio only has to be .25 (the average win only has to be $1,000 while the average loss can be as high as $4,000).

The standard for a *very good* system is to generally take a 10 percent lower winning percentage while maintaining a 1.0 better win/loss ratio over the breakeven point. If I have a method showing 70 percent correct, I will move the percentage down to 60 percent and require that the win/loss ratio still be better than 1.0 over the breakeven point. This means the ratio would have to be at least 1.70 with a 70 percent correct strategy. With a 50 percent strategy, the win/loss ratio would need to be 2.50. If this combination exists, you are about as close to a Holy Grail strategy as you are going to get.

Average Drawdown

The average drawdown is different from the largest drawdown. The average drawdown takes all drawdowns and averages them out. When the drawdowns start to occur, you can use this as a guide to know where to start watching it closely. It is best not to take into consideration any drawdown less than or equal to three times the average size of a losing trade. This is the standard my Performance I program used to determine the average drawdown. Further, it is also good to compare this number with the largest drawdown statistic. Generally, I like to see about a two-to-one ratio of largest drawdown to average drawdown. If the ratio is any less than that, the largest drawdown will most likely be much larger.

Another ratio that can give some valuable insight is the average drawdown to the average yearly profit. This takes a more common experience approach to let you know what you can consistently expect. If the average yearly profit is $5,000 and the average drawdown is $4,000, then you have a much better idea of the overall relationship between the drawdown expectation and profit expectation. I generally

require at least a l-to-l ratio or greater between the two. Ideally, I like to see a 2-to-1 average yearly profit to average drawdown ratio.

Ratio of Largest Win to Average Win

This statistic will also include the ratio of largest loss to average loss. The value of this statistic ranks near the bottom but I look at it to gauge whether my largest win was just an all-out luck trade that I can never really expect, or whether there is a legitimate chance that I will see other wins near that scale. If the largest win is greater than three or four times the average win, don't count on seeing it. If it is less than three times the average win, you have a higher potential of seeing some larger trades with the method. If the largest loss is three or four times the average loss, it probably means that it occurred as a result of slippage or a gap opening or something along those lines. Losses in that range should be far and few between. If the ratio is less than three, the larger losses may be the rule and should be expected.

Profit Factor

The last statistic, and certainly not the least that I will cover is the profit factor. This statistic divides the gross profit by the gross loss. If the gross sum of winning trades in a method was $100,000 while the gross sum of losing trades was $50,000, then the profit factor would be 2.0. (This would also make the net profit $50,000.) This is a confirming statistic for me. If other statistics are in line or for that matter, on the border, I will take a look at this statistic and require a minimum of 2.0. This means I won twice as much as I lost. This statistic is closely related to the average win/loss ratio and winning percentage statistics. For example, at 50 percent profitable with a 2.0 win/loss ratio, the profit factor will also be 2.0. If I get a better than 2.0 profit factor, I may be willing to fudge every so slightly on my requirements for the winning percentage and win/loss ratio.

Many other statistics can be generated and analyzed. However, at some point, the search becomes overkill and redundant. I like to pick several that cover both risks and rewards and a few comparisons between the two. If everything lines up on those, most everything will line up on other statistics as well. I have done my homework. No matter how many statistics you look at and no matter how many fall within your designated requirements, it will not change how the system is going to perform. I do not like to use statistics to gauge how much money I am going to make by trading any particular system. I use statistics to gauge when I should say "uncle" and when I should stick things out.

THE LOGIC OF THE METHOD

Do not put your entire portfolio on a black box system. A black box system is one where you do not know why trades are being generated. If the statistics of a black box system look too good to be true, they probably are. The only way for a trader to verify the true robustness of a method or system is by personally testing the rules. I can produce whatever statistics you want to see. I can produce the Holy Grail of systems according to the statistics. But I would not trade the thing with a dime. Statistics can be produced by what is called curve-fitting the data to the market. Another popular term for it is optimizing. Optimizing is addressed extensively in Chapter 14.

Knowing the logic of a system not only will help you know whether it has been optimized to fit the data, but also will give you confidence in the method itself, especially during drawdowns. Regardless of how the method is trying to take advantage of the markets, the most sound logic will be ground in the numbers. The most sound, robust, and logical systems are ones that cut the losing trades short and let the profits ride. This is one of the oldest cliches in the trading and investing industry, but it is one of the best. So many try to beat the markets with their PhD in mathematics or economics. Their education and wisdom that exceeds all wisdom will beat the markets, or so they are convinced. I tell you that a completely uneducated, unlearned, and highly unqualified individual could probably do just as well as these experts just by following the basic rule of cutting losses short and letting the profits ride. Most ignore this because it sounds too simple. Surely there is more to beating the markets. Oh there is, but it starts with that statement.

I could be here for days telling you horror stories of massive losses suffered by traders who just did not believe in cutting losses short and letting profits ride. They knew this simple truth deep down, but when the profit was there, they had to take it. If a loss is being endured, it is because they are sure the market is going to turn around. And, rest assured it will, as soon as you can't take it anymore and say uncle. Nowadays, we have fuzzy logic and artificial intelligence, chaos theories, random conformations, discomboobalations, and who knows how many

other types of logic out there based on the belief that the markets are somehow predictable. And, if the method-devised by one of these experts turns out to work, that developer says, "See, I told you this stuff works." I'll bet though that if it works consistently, it is because it cuts losses short and allows profits to ride. I guess they just want to believe that their education and skill are worth more than the results from a simple rule. Although other logics may work, cutting losses short and allowing profits to ride is king in a trading method. It is the most reliable logic that can be applied across the board.

The next object of logic I look for is the basis for getting into a trade. Is it trend following, is it a breakout method, is it a top and bottom picker? Does the method try to take advantage of short-term momentum or retracements? Is the method based on cycles or seasonal? About 95 percent of the methods fall under one of these categories. Once I have established which category it falls under, I then determine how logical the reasons are for actually entering the trades. For example, if the method is based on picking tops and bottoms in the coffee market, I might think twice about trading it if the logic of picking the top or bottom is based on the amount of milk old Bessy is producing back in the barn these days. That may be an exaggeration, but you would be surprised at how many traders out there base their trades on completely irrelevant data. Some believe that tops and bottoms can be picked based on the cycles of the planet Pluto. Others think that there is some magical mathematical equation that can actually pick the top and bottom of a market for the next day. Yeah, and on a good day, I might be able to fly without the help of any man-made equipment (until I hit the ground, that is, and reality slaps me upside the head . . . hard).

Last of all, simple is better. The more complicated, the less I like it. Simple is easy to understand and easy to change. Not only is there less programming code to deal with but the system is less likely to be conformed to the data. Further, if a method is simple and logical but is missing the last key ingredient that will really push it over the wall of potential success, dealing with a complicated method will keep it from going over. If you will take the following steps, you can help prevent a losing situation, but even with these safeguards, you cannot completely filter out all losing systems and methods:

1. Make sure the body of the logic is related to what you are trying to accomplish.
2. Make sure the statistics are in place and meet the minimum requirements.
3. Make sure the logic of the entries and exits relate to the goal you are trying to accomplish.
4. Make sure the method is as simple as possible to capture the logic.

A SIMPLE TRADING METHOD

I have talked an awful lot about what works and what doesn't work as far as simplicity and logic in the markets. The following method is about as simple and logical as they come. Further, few systems or methods will generate the statistics you are going to see in the following few pages.

This is a trend-following method and reverses. There are no exit rules other than a reversing situation and a set protective stop. If the method is currently long a particular market, it will continue long until there is a signal to reverse and go short or it is stopped out for a loss. The results for eight markets are shown in the box on pages 184-185.

The method that produced these numbers is surprisingly simple. The rules are as follows:

Buys:

1. Requires the average close of X days to be greater than the same average close Y days ago.
2. Requires the close to be less than the close Y days ago.
3. Requires the close to be greater than the close Y + X days ago.

If these three conditions are met, the method will buy on the open the next day.

Sells:

1. Requires the average close of X days to be less than the same average close Y days ago.
2. Requires the close to be greater than the close Y days ago.
3. Requires the close to be less than the close Y + X days ago.

If these three conditions are met, the method will sell on the open the next day.

For example, if X = 20 and Y = 3, then the average close of the previous 20 days must be greater (for buys) than the average close of

Bonds	
Net profit	$92,000
# winners/losers	30/48
Winning %	63%
Average win	$3,775
Average loss	$1,150
Win/loss ratio	3.29
Average trade	$1,915
Largest drawdown	($5,875)
Profit factor	5.48
% time in dd.	52%
Average drawdown	$2,100

Swiss Franc	
Net profit	$81,800
# winners/losers	37/66
Winning %	56%
Average win	$3,440
Average loss	$1,570
Win/loss ratio	2.19
Average trade	$1,239
Largest drawdown	($9,000)
Profit factor	2.80
% time in dd.	68%
Average drawdown	$4,500

Crude Oil	
Net profit	$65,290
# winners/losers	43/73
Winning %	59%
Average win	$2,000
Average loss	$725
Win/loss ratio	2.80
Average trade	$895
Largest drawdown	($5,700)
Profit factor	4.01
% time in dd.	59%
Average drawdown	$1,700

Wheat	
Net profit	$25,740
# winners/losers	35/61
Winning %	57%
Average win	$1,180
Average loss	$615
Win/loss ratio	1.93
Average trade	$404
Largest drawdown	($4,800)
Profit factor	2.50
% time in dd.	69%
Average drawdown	$1,500

JY	
Net profit	$118,300
# winners/losers	20/35
Winning %	57%
Average win	$3,900
Average loss	$1,500
Win/loss ratio	2.60
Average trade	$2,235

10-Year Notes	
Net profit	$62,000
# winners/losers	30/50
Winning %	60%
Average win	$2,600
Average loss	$890
Win/loss ratio	2.92
Average trade	$1,240

Largest drawdown	($9,400)
Profit factor	4.29
% time in dd.	64%
Average drawdown	$3,500

Largest drawdown	($5,900)
Profit factor	4.50
% time in dd.	64%
Average drawdown	$1,700

D-Mark	
Net profit	$64,500
# winners/losers	24/38
Winning %	63%
Average win	$3,400
Average loss	$1,300
Win/loss ratio	2.6
Average trade	$1,700
Largest drawdown	($6,500)
Profit factor	4.50
% time in dd.	56%
Average drawdown	$2,700

Eurodollar	
Net profit	$13,250
# winners/losers	27/47
Winning %	57%
Average win	$775
Average loss	$385
Win/loss ratio	2.02
Average trade	$280
Largest drawdown	($2,850)
Profit factor	2.72
% time in dd.	64%
Average drawdown	$800

Combined Results for All 8 Markets

Net profit	$520,000
# winners/losers	2431422
Winning %	57%
Average win	$2,860
Average loss	$1,000
Win/loss ratio	2.8
Average trade	$1,230
Largest drawdown	($14,500)
Profit factor	3.90
% time in dd.	65%
Average drawdown	$3,400

the last 20 days starting 3 days ago. This simply means that the average close of the last 20 days is sloping up:

It then requires that today's closing price is less than the closing price 3 days ago. This helps determine a pullback before the entry into the market. Finally, it requires that the close, even though it is less than the close 3 days ago, is greater than the close 23 days ago. This is a verifier of the up-slope moving average. The method will stay with a position until the reverse setup occurs or unless the market goes against the position too far without the reverse setup occurring.

That's it. Three very simplistic, very logical rules produced the preceding test results. The statistics are so impressive that not much analyzing needs to be performed on whether it is worth trading or not. The only question is, what is X and what is Y? For all practical purposes, X can be anything that will reflect the up-slope line of a longer term trend. Y can be anything that will reflect a short-term pullback. Certain values for X and Y will produce better statistics than others. As a general rule, however, as long as the values fall within the logic of the method, they should all produce solid statistics.

14

OPTIMIZATION

This subject would seem to be somewhat out of place in a book about money management. However, indirectly, it is very much related to the topic. Money management without a method or system to trade is useless. Further, trading a method with a negative mathematical expectation is practically useless as well. Therefore, a method or system must make profits for money management growth factors to play an important role in the end result. Open any trade magazine and you will find more systems and methods than you can possibly ever trade. All of them sound great and most claim they have the best trading method there is. Further, hypothetical results are the basis for most of these claims. I received a mailer just today whose author claimed to have turned $200 into $18,000,000 (that's $18 million!) in just a few short years. And you can, too, by buying the $39.95 book and reading the incredible trading method contained within it. (For a small fee, I'll even tell you what book it is.) The point is that most of these hypothetical claims come only after much optimization testing has been executed on the method. If money management is inextricably linked to the method or methods being traded, then the validity of hypothetical results become important when deciding to trade a method.

AN OVERSTATED REASON FOR OPTIMIZATION

One of the most popular reasons for optimization is to find the best parameters of a system over a historical period of time in the markets. A simple example would be the tried and true simple moving average crossover. If the 10-day moving average crosses above the

40-day moving average, you buy. If the 10-day moving average crosses below the 40-day moving average; you sell. This system has three parameters. The first is the length of the short-term moving average; the second is the length of the longer term moving average; and the third is the kind of moving average being used. Each of these parameters is defined. The short-term moving average is 10. The long-term moving average is 40 and the type of moving average is simple (as opposed to displaced, weighted or exponential).

If we apply this method to a daily bond market chart for the past five years, we get the following statistics:

Net profit	$29,000
Number trades	32
Number winners	12
Number losers	20
Winning %	37.5%
Average win	$5,200
Average loss	$1,700
Average trade	$906
Win/loss ratio	3.08
Largest DD	$11,593

These are the basic performance statistics. They are not the type of statistics that will make traders jump on in, but they are solid statistics. However, these statistics were not based on the optimum parameter settings. What would happen if we were to optimize the parameters to yield the highest profit? We would need to optimize all three parameters at the same time to yield the best combination. Therefore, I tested the short-term moving average from 4 to 19 in increments of 1. The longer term moving average was tested from 20 to 50 in increments of 1; each of those tests was then tested using the simple moving average, displaced, exponential, and weighted moving averages.

The best results came from using the simple moving average with a short-term average of 10 and a longer term moving average of 34:

Net profit	$57,000
Number trades	28
Number winners	17
Number losers	11
Winning %	60%
Average win	$4,200
Average loss	$1,300
Average trade	$2,000
Win/loss ratio	3.20
Largest DD	$5,000

The best result from the displaced moving average crossover was a close second with just under $57,000 in net profits. However, it took 34/57 trades with a $1,000 average trade on only a $5,600 drawdown. The short-term average was 6, whereas the longer term average came in at 25. The weighted moving average crossover was again, very close behind with just under $57,000 over 18/36 trades. The win/loss ratio was at 4.0 with an average trade of almost $1,600. Drawdown was again reasonable at only $5,600. The exponential moving average crossover was comparatively disappointing with only $23,000 in profits, 32 percent profitable with a $10,000 drawdown. The average trade still came in at $700, though.

There we have it. The optimized results of a moving average system applied to the bond market. Now the only question is, what good does this information do us? Well, not much, I'm afraid. This information alone is nothing short of useless except to tell us that with certain parameter settings, this system made money during a certain five-year period. The preceding results are basically all that you see when someone soliciting a system or method shows hypothetical testing. Most often, the back-test results are quite good. The following paragraphs, however, show that optimizing a trading system in one market and on one set of data is much like optimizing fixed fractional trading on a data set, as explained in Chapter 5. What is optimal for one set of data may not be optimal for another.

A DEEPER LOOK INTO OPTIMIZING

To illustrate this, the following test results were again from the bond market, but this time, the simple moving average crossover system was optimized from 1990 to 1993:

1990-1993 Optimized Parameters	
Net profit	$34,000
Number trades	21
Number winners	10
Number losers	11
Winning %	48%
Average win	$4,300
Average loss	$800
Average trade	$1,600
Win/ loss ratio	5.30
Largest DD	$6,100

For the simple moving average system optimized from 1993 to 1995, the parameters that yielded the most profits were 10 for the shorter term moving average and 34 for the longer term moving average. Not so from 1990 to 1993. The optimized parameters were 18 for the shorter term average and 48 for the longer term average. Had we optimized this data back in late 1993 and decided to trade these parameters in 1994 through 1998, our results would be:

1990-1993 Optimized Parameters Applied to 1994-1998 Data	
Net profit	$23,000
Number trades	18
Number winners	8
Number losers	10
Winning %	44%
Average win	$6,300
Average loss	$2,600
Average trade	$1,300
Win/loss ratio	2.35
Largest DD	$13,000

There are important differences in the two outcomes. First, the net profit was quite a bit lower over a longer period of time than it was for the optimized period. The winning percentage dropped slightly, and there was a huge difference in the average loss. Imagine going into a system thinking that the average loss should be $800 and then start suffering average losses of $2,600. It would be difficult to continue trading. Further, the win/loss ratio was significantly lower. When both the winning percentage and win/loss ratio are significantly lower, there is much less room for error. Finally, the drawdown was not tagged at $6,000, but more than double that at $13,000. If you believe that you will only suffer a $6,000 drawdown and maybe slightly more than that, at what point would you say uncle and quit trading this method as the drawdown continued? For most of us, it would not be too much higher than the $13,000.

The next set of results shows the same parameters on the same market but during a different time period. This time period takes a portion from the first testing period and a portion from the second testing period. The dates are from I992 through 1996. The parameters being used are 18 for the shorter term moving average and 48 for the longer term:

Net profit	$6,600
Number trades	14
Number winners	4
Number losers	10
Winning %	29%
Average win	$7,700
Average loss	$2,400
Average trade	$475
Win/loss ratio	3.20
Largest DD	$17,000

What a difference! During almost four years, this method using the preceding parameter settings only produced $6,600 with just 4 winners! The largest drawdown during this period is $17,000. As you can see, statistics can be deceiving, especially optimized statistics. Yes, the method still made money, and there is something to be said

for that. But would you have been able to continue trading it? Take the same method and same parameters and apply them to another market. What happens to those statistics? The following results were from applying the same method to the Swiss franc market from 1993 through 1998. The first set of results was from using the 18 and 48 moving averages and the second set came from applying the 10 and 34 moving average parameters:

Net profit	$10,000	Net profit	$8,000
Number trades	29	Number trades	45
Number winners	10	Number winners	15
Number losers	19	Number losers	30
Winning %	34%	Winning %	33%
Average win	$3,200	Average win	$3,000
Average loss	$1,200	Average loss	$1,200
Average trade	$350	Average trade	$175
Win/loss ratio	2.75	Win/loss ratio	2.40
Largest DD	$7,000	Largest DD	$11,000

Not only were these results quite a bit different from each other and from the bond market, but they were different from the optimized results of this market. After optimizing the parameters, the optimal short-term moving average was 19, whereas the optimal longer term moving average was 27. The results in the box on the top of page 197 come from that testing.

Without belaboring the point, all systems and all markets will find similar differences between the optimized results within different time frames and markets. And, if that is the case, what can we realistically expect from systems? If the optimization results are not realistic, how do we as traders know what to expect? In a word, we don't know. We can make some logical conclusions, however, not from the optimized results, but from the optimization process. Optimization should never be conducted to find the "best" parameters, stops, exit rules, or whatever piece of a system is being optimized. The best in the past *will* not be the best in the future. This I can say has a greater probability than you can say that you won't be struck by

Net profit	$39,000
Number trades	52
Number winners	26
Number losers	26
Winning %	50%
Average win	$2,600
Average loss	$1,100
Average trade	$730
Win/loss ratio	2.30
Largest DD	$6,000

lightning. Further, there is a very high probability that the optimized results for one data set will not even be close to the optimized results of an equal size data set during a different time period.

THE OPTIMIZATION PROCESS

The only practical benefits that can be derived from optimizing come not from the statistics of the results themselves, but rather from the statistics of all of the testing from the optimization. For example, the optimization performed on the Swiss franc market with the simple moving average crossover system went through 496 different parameter tests. Each one of those tests produced a different set of statistics. To be able to draw some practical conclusions on what to expect from any given trading system, it is much more beneficial to know what kind of numbers the bulk of those tests produced than what kind of numbers the single best test produced.

When I optimize a system, I do not look for the best results; instead, I try to determine how robust the profitability of the system was throughout the testing process. Going back to the simple moving average crossover system being tested in the bond market, there were 496 tests overall from 1994 to 1998. During this particular time period, the best results came from applying a shorter term moving average of 10 and a longer term moving average of 34. Here are the results from this four-year period:

Net profit	$44,000
Number trades	21
Number winners	13
Number losers	8
Winning %	62%
Average win	$4,200
Average loss	$1,300
Average trade	$2,100
Win/loss ratio	3.15
Largest DD	$5,000

These statistics will be the first control data set. The next set of statistics are from the worst performing set of parameters. These numbers were produced from applying a shorter term moving average of 4 and longer term moving average of 25:

Net profit	($14,000)
Number trades	57
Number winners	16
Number losers	41
Winning %	28%
Average win	$2,800
Average loss	$1,400
Average trade	($245)
Win/loss ratio	2.00
Largest DD	$17,000

These are our two extremes. The first good news is that the best is far better than the worst. Sometimes, you will see the best make

$40,000 and the worst lose $40,000. Going a little further with the statistics reveals the following interesting numbers:

- Out of 496 tests, 475 combinations made money.
- 367 made more than $14,000 in profits.
- 196 made more than $22,000 (half or better of the best).
- Only 5 combinations were within 10 percent of the best.
- Only 175 combinations made money on the short side (which means 321 lost money).
- The most profits the short side could produce was $9,600.
- The largest drawdown out of all 496 tests was $19,000.
- 206 tests had drawdowns of $10,000 or greater.
- Only 55 combinations had drawdowns of less than $8,000.
- The average drawdown was over $11,000.
- 405 tests had a winning percentage of less than 50% (which means only 91 combinations had a winning percentage greater than 50%).
- The best winning percentage was 62%, while the worst was 23%.
- The average winning percentage was 40%.
- The profit factor (see definition in Chapter 13) was at 2.00 or higher 161 of the combinations.
- The profit factor was less than 1.5 in 165 of the combinations.
- 496 out of 496 combinations made money on the long side. (Bonds were in a long-term uptrend during most of the time period.)
- 457 combinations totaled $15,000 or greater on the long side.

The optimization testing process can reveal much more relevant and practical information than just seeing the best combination of parameters. Many systems and methods out there will actually result in profits with a certain set of numbers and losses one or two standard deviations from those parameters. The simple moving average crossover is not a massive profit-producing system, but as described later in this chapter, we can assume some probabilities for future results.

OPTIMIZATION COMPARISONS

Now that we have some relevant data, we need to put that data to some use. The best approach is to compare it with another set of testing data. The previous tests were run on the bond market from 1994 through 1998. The following are the same data run on the same market from 1990 through 1994. Again, 496 combinations were tested:

- Out of 496 tests, 361 combinations made money.
- Only 76 made more than $14,000 in profits.
- Only 27 made more than $22,000 (half or better of the best of first test).
- Only 2 combinations were within 10% of the best.
- None (as in 0) combinations made money on the short side.
- The least amount of losses the short side produced was ($2,100).
- The largest drawdown out of all 496 tests was $27,000.
- 338 tests had drawdowns of $10,000 or greater.
- Only 48 combinations had drawdowns of less than $8,000.
- The average drawdown was over $14,000.
- 477 tests had a winning percentage of less then 50% (which means only 19 combinations has a winning percentage greater than 50%).
- The best winning percentage was 61%, while the worst was 24%.
- The average winning percentage was 38%.
- The profit factor (see definition in Chapter 13) was at 2.00 or higher 41 of the combinations.
- The profit factor was less than 1.5 in 417 of the combinations.
- Only 361 out of 496 combinations made money on the long side.
- Only 68 combinations resulted in $15,000 profits or greater on the long side.

The two sets of data have some large disparities. The first is in the number of combinations that actually made money. The number of combinations that made money dropped by 25 percent. However, the number of combinations that made $14,000 or more total profits dropped by 80 percent. The number of combinations that made at least half the profits of the best combination dropped by 86 percent. The number of combinations that made money on the short side dropped 100 percent. Other relevant data comparisons show that:

- The largest drawdown increased by 42%.
- The number of combinations that produced drawdowns greater than $10,000 increased by 64%.
- The average drawdown increased by $3,000 (27%).
- A profit factor of 1.5 or better dropped from 331 combinations to only 79.
- The long side profits dropped 27% and long profits greater than $15,000 dropped 85%.

The obvious problem with this method is consistency. If traded over an eight-year period, chances are that you will make at least some money. Chances that you will make a decent return with low drawdowns are not that great. Optimization will show you what the optimum parameters were for the data period tested, but they can't even come close to telling you what the optimum parameters *will* be during the next trading period when you actually have money at risk. Suppose we go back to the year 1994 having just completed testing on this system with parameters of 18 for the shorter term moving average and 47 for the longer term moving average. What is the probability that 18 and 47 will be the optimum parameters for trading in 1995? The probability is $\frac{1}{496}$ that these will be the optimum parameters. And, if we pick another set of parameters, the probability of that set being the optimum is also only $\frac{1}{496}$! I would say that the odds here are against us (provided that the optimum parameters fall within the range tested).

Therefore, what we need is large room for error. Chances are we will not pick the best combination. However, we probably will not pick the worst performing parameter either. What we want to do is trade a system where the odds of making money are in our favor regardless of which combination or set of parameters we choose. The moving average crossover system went through a bad cycle and then a good cycle. Had we begun trading this system in 1990, the probability of us making more than $14,000 after four year of trading was only 15 percent. However, the probability of us making money during the next four years increased to 74 percent. This is not consistent data. Further, it

becomes obvious that being able to pick which set of parameters to use becomes almost impossible. Consider the following:

1990

- The best combination was 19 and 24. That combination made $15,000 in 1990.
- The combination of 17 and 24 made only $3,000.
- The combination 16 and 24 lost $3,000.
- The combination 19 and 25 made $5,000, while 26 and higher lost money.
- 31 combinations made money, while 465 lost money.
- The average drawdown was close to $9,000.

1991

- The combination 19 and 24 made $3,000.
- The best combination was 19 and 20 making $13,000.
- 430 combinations made money.
- 240 combinations did better than 19 and 24 during that year.
- None of the combinations made money on the short side.
- The average drawdown was $4,000.

1992

- The combination 19 and 20 lost $3,500.
- The combination 19 and 24 made $1,125.
- The best combination was 19 and 22 producing $8,000 in profits.
- 337 combinations made money.
- 259 combinations produced more than $1,125.
- 449 combinations produced better than 19 and 20.
- None of the combinations made money on the short side.
- The average drawdown was $5,000.

1993

- The combination 19 and 22 made $3,700.
- 19 and 24 lost $3,800.

- 19 and 20 made $3,800.
- The best combination was 7 and 50 producing $10,000.
- 298 combinations made money.
- 124 combinations produced more profits than 19 and 22.
- None of the combinations made money on the short side.
- The average drawdown was $8,000.

1994

- The combination 7 and 50 lost $10,000.
- 19 and 20 lost $2,200.
- 19 and 24 lost $17,000.
- 19 and 22 lost $4,000.
- The best combination was 12 and 28 producing $6,500 in profits.
- Only 124 combinations made money.
- 140 combinations produced better than 19 and 20.
- Only 14 combinations produced money on the long side.
- 215 combinations produced money on the short side.
- The average drawdown was $10,000.

1995

- The combination 12 and 28 lost $1,400.
- 19 and 22 made $7,500.
- 19 and 24 made $2,800.
- 19 and 20 made $2,600.
- 7 and 50 lost $3,600.
- The best combination was 14 and 29 producing $21,000 in profits.
- Only 77 combinations made money.
- Only 21 produced more than $3,000 in profits.
- 65 on the long side and 40 on the short side made money. (342 combinations had an open profit of at least $2,000 on a long position at the end of the year.)
- The average drawdown was only $3,000.

1996

- The combination 14 and 20 lost $7,500.
- 12 and 28 lost $5,700.
- 19 and 22 lost $5,000.
- 19 and 24 lost $8,000.
- 19 and 20 lost $4,000.
- 7 and 50 lost $8,500.
- The best combination was 7 and 21 producing $5,100 in profits.
- Only 40 combinations made money.
- Only 2 combinations made money on the short side.
- 11 combinations made $3,000 or better.
- 341 combinations lost $3,000 or more.
- The average drawdown was $9,000.

1997

- The combination 7 and 21 lost $375.
- 14 and 20 lost $2,000.
- 12 and 28 lost $1,000.
- 19 and 22 made $4,000.
- 19 and 24 lost $3,500.
- 19 and 20 lost $4,000.
- 7 and 50 lost $1,200.
- The best combination was 19 and 26 producing $8,300 in profits.
- 274 combinations made money.
- Only 34 combinations made $3,000 or more in profits.
- 72 combinations lost $3,000 or more.
- None of the combinations made money on the short side.
- None of the combinations lost money on the long side.
- The average drawdown was $4,000.

1998 (through October 5)

- The combination 19 and 26 produced $12,000 in profits.
- 7 and 21 made $6,300.

- 14 and 20 made $8,000.
- 12 and 28 made $7,000.
- 19 and 22 made $10,000.
- 19 and 24 made $13,000.
- 19 and 20 made $10,000.
- 7 and 50 made $4,600.
- The best combination was 18 and 22 producing $15,000 in profits.

1998 was not yet over at the time of this testing. Therefore, all open trades as of October 5, were automatically closed. This happened to be right after one of the most unprecedented moves in history in the bond market to record highs, which started in the beginning of August. Taking the trades and ending any open positions in August produce quite different results, as follows:

- The combination 19 and 26 produced $3,800 in profits.
- 7 and 21 lost $3,500.
- 14 and 20 lost $2,000.
- 12 and 28 lost $1,500.
- 19 and 22 made $2,000.
- 19 and 24 made $4,000.
- 19 and 20 made $2,000.
- 7 and 50 lost $5,000.
- The best combination was 18 and 22 producing $7,400 in profits.
- 72 combinations made money.
- 13 combinations made $3,000 or more.
- 247 combinations lost $3,000 or more.
- Only 12 combinations made money on the short side (2 over $1,000).
- The average drawdown was $5,000.

These are the year-by-year statistics. Not a single year had the same best producing parameters as the previous year, nor did any two years have the same two parameters. In fact, the following are the best parameters for each year and their overall performance had each set been traded throughout the eight-year period.

19 and 24		7 and 50	
Net profit	$10,000	Net profit	$32,000
Number trades	127	Number trades	69
Number winners	63	Number winners	28
Number losers	64	Number losers	41
Winning %	50%	Winning %	41%
Average win	$1,600	Average win	$3,000
Average loss	$1,500	Average loss	$1,300
Average trade	$78	Average trade	$473
Win/loss ratio	1.12	Win/loss ratio	2.35
Largest DD	$29,000	Largest DD	$12,000
19 and 20		12 and28	
Net profit	$39,000	Net profit	$38,000
Number trades	259	Number trades	74
Number winners	130	Number winners	32
Number losers	129	Number losers	42
Winning %	50%	Winning %	43%
Average win	$1,100	Average win	$3,300
Average loss	$800	Average loss	$1,600
Average trade	$150	Average trade	$500
Win/loss ratio	1.34	Win/loss ratio	2.04
Largest DD	$11,000	Largest DD	$11,000
19 and 22		**14 and 20**	
Net profit	$50,000	Net profit	$37,000
Number trades	161	Number trades	122
Number winners	79	Number winners	56
Number losers	82	Number losers	66
Winning %	49%	Winning %	46%
Average win	$1,700	Average win	$2,200
Average loss	$1,000	Average loss	$1,300
Average trade	$315	Average trade	$300
Win/loss ratio	1.66	Win/loss ratio	1.68
Largest DD	$11,000	Largest DD	$16,000

7 and 21		18 and 22	
Net profit	$9,700	Net profit	$43,000
Number trades	124	Number trades	138
Number winners	52	Number winners	69
Number losers	72	Number losers	69
Winning %	42%	Winning %	50%
Average win	$2,000	Average win	$2,000
Average loss	$1,300	Average loss	$1,400
Average trade	$78	Average trade	$315
Win/loss ratio	1.53	Win/loss ratio	1.47
Largest DD	$18,000	Largest DD	$13,000
19 and 26			
Net profit	$29,000		
Number trades	100		
Number winners	45		
Number losers	55		
Winning %	45%		
Average win	$2,600		
Average loss	$1,600		
Average trade	$290		
Win/loss ratio	1.62		
Largest DD	$19,000		

All the combinations made money over the long haul. However, over the long haul, only 40 combinations lost money during that time period. Therefore, regardless of the parameters we used, we had a 92 percent chance of making money over an eight-year period. In fact, over the eight-year period, 306 combinations (62%) made $24,000 or more for an average of $3,000 per year. Having the best parameters of each year still only produced 68 long-term results with at least $24,000.

What about drawdown? The results show that 442 combinations (90%) produced a $10,000 drawdown of larger; 146 combinations (30%)

produced a drawdown of $15,000 or higher; and 34 combinations (7%) produced a drawdown of $20,000 or higher.

The question is, with all this data, can you accurately predict what will be the optimum parameters for the year 1999? Smart money says no way. But, take comfort in knowing that you have a 62 percent chance of picking a combination that should make better than $3,000 on average every year for the next eight years. Further, you only have a 7 percent chance of losing more than a total of $3,000 over the next eight years.

Nonetheless, compare all this data with the test results using the optimized parameters for the eight-year period:

Net profit	$63,000
Number trades	58
Number winners	31
Number losers	27
Winning %	53%
Average win	$3,400
Average loss	$1,760
Average trade	$1,100
Win/loss ratio	2.16
Largest DD	$9,593

Then, ask yourself what your chances are of reproducing these results during the next eight years. Provided that the optimum parameters produce similar statistics, your chances of reproducing are 1 in 496, or $^{3}/_{10}$ths of 1 percent, Something to think about the next time someone gives you some hypothetical testing results.

15

COMMODITY TRADING ADVISORS (CTAs) AND MONEY MANAGEMENT

This chapter is not long but is for CTAs and traders alike who want to know a little more about the logic and money management most CTAs use. It provides CTAs with another option in- trading customer accounts. In addition, those who are interested in possibly investing with a particular CTA can learn what questions to ask and what things to look for.

First, CTA and CPO stand for Commodity Trading Advisor and Commodity Pool Operator. They are more commonly known as fund managers in the commodity and options industry. Approximately 3,500 CTAs are registered with the National Futures Association. CTAs manage anywhere from as little as a few hundred thousand dollars to upward of hundreds of millions of dollars.

LARGE CTAs

As a general rule, large CTAs manage money extremely conservatively. They understand that drawdowns as small as 8 percent can lead to a mass exodus of funds. Therefore, they focus much attention on keeping the risk levels down. As a result of this goal, most major fund managers employ a Fixed Fractional money management method to their trading. Usually, no more than a fraction of one percent is risked on each trade. This doesn't sound like much, but if the CTA

has $50 million under management and there is only one strategy being traded with a $3,000 stop, this comes to one contract for every $600,000 under management, or 83 contracts. Like most individual traders though, CTAs do most of their research on where to get in and where to get out of trades, not on how to actually manage the money being traded.

CTAs can do a few simple things to sustain the current risk (if not decrease it) while increasing the potential profits of the entire fund. The first is to get rid of the fixed fractional money management method. The next is division of money. By replacing the Fixed Fractional money management method with at least a form of the Fixed Ratio method and properly dividing funds and allocating them to separate methods and systems, overall risk can be sustained or even decreased, while diversification and potential geometric growth can be increased.

An example is a firm with $50 million under management. If the CTA has divided the funds into four equal amounts to be traded with four separate trading methods, then the risk on each method is usually according to the amount divided, the total sum of the money under management. This means that with this example, a $3,000 risk trade would be traded according to ½ of one percent risk into $12500,000. This comes to trading 20 contracts on the next trade. This is pretty conservative which means that 4 losing trades only produces a 2 percent loss or drawdown.

If you think it is unlikely that four different systems will suffer four consecutive losses of $3,000 per contract, you are thinking along the wrong lines. If the risk was only $1,500, the number of contracts double according to their money management schemes. Therefore, the $3,000 losing trade comes to a $60,000 loss, the $1,500 losing trade comes to a $60,000 loss, the $500 losing trade comes to a $60,000 loss. You get the picture. Even as conservative as this is, there is a price to pay. That price is growth potential.

Suppose that each system produced $50,000 based on a single unit being traded over the next 12 months. Remember, the calculation for a largest loss of $3,000 risking no more than ½ of 1 percent on each trade comes to one contract for every $600,000 in the account. Therefore, contracts will only increase from 20 to 22 being traded during this period. The money management scheme will only increase the return from $4,000,000 to 4,300,000. This means that instead of an 8 percent return, they have a whopping 8.6 percent return! Not much help from this money management method.

One suggestion to solve this problem is to divide the money into 12 or 15 equal portions and trade 12 or 15 different methods including all types of strategies in all types of markets. Because this creates a much wider diversified portfolio, the potential exists of keeping the risks extremely low. At the same time, the lower number of contracts being traded will create an atmosphere of geometric growth. For example, at $50,000,000 divided into 15 different segments, each segment will consist of $3,333,333. Referring back to the three phases of money management, each segment can start out trading 6 to 10 units of whatever market is being traded which will put them in the immediate position to benefit from geometric growth. If the risk on the next trade is $1,500 trading 8 contracts, they will be risking approximately .0036 percent or just over one-third of 1 percent on that trade. If the risk is at $3,000 per contract, then the risk on the trade is just over two-thirds of 1 percent. Therefore, the risk is comparable to the Fixed Fractional method. However, the Fixed Fractional method would only be trading 5 contracts and would need the method to produce a whopping $120,000 per contract or unit before that method could move to trading 6 contracts! With the Fixed Ratio money management, the method would only have to increase an additional $5,000 to $10,000 per contract, depending on how conservative or aggressive the delta is set. By doing this, the estimated outcome after the method has made $50,000 per contract is $650,000 with the Fixed Ratio trading (or 19.5%) compared with $250,000 with the Fixed Fractional (or 7.5%). This is a 260 percent increase over the fixed fractional method without increasing the overall risk. If a drawdown of $10,000 were to occur at the end of the $50,000 run, the total overall risk of the account would be at 4.25 percent. Further, if all 15 methods were all to suffer a $10,000 drawdown at the same time from the word go, the entire fund would only suffer a 2.4 percent drawdown. In fact, all 15 methods would have to suffer a drawdown of $33,334 per contract to reach the 8 percent drawdown mark.

8 units x $33,334 = $266,672

$266,672 x 15 methods being traded = $4,000,080

$4,000,080 / $50,000,000 in fund = 8.00016% (8%)

As discussed earlier, this is all but impossible. For all 15 methods to go into a largest drawdown of $33,000 at the same time is 1 chance in somewhere around 1 with 20 zeros after it. And if it ever were to

happen, the firm would need to fire the system developers and researchers!

SMALL CTAs

Some CTAs do not even have $3 million under management. As a result, their risk is normally going to be a bit higher than that of the larger CTA who can afford to diversify much more effectively. However, the smaller CTAs also have a higher probability of sustaining higher returns than the larger CTAs. The smaller CTA, who is willing to risk more than 8 percent of the capital for the sake of growth, can see upward of 40 percent returns with the help of money management. The main difference between a small CTA and a larger CTA is how the funds are diversified. With the large CTA, the funds are divided and treated almost as separate little funds. Although the smaller CTA will trade several methods for diversification, all the methods will be traded as one portfolio. Therefore, the number of contracts that can be traded is still high enough to place the fund in position to immediately benefit from geometric growth.

If the small CTA has $3,000,000 under management and is trading four methods as one single portfolio, the fund can still trade 8 contracts without exposing the fund to an inordinate risk. If each method had an expected drawdown of $15,000 and all went into a drawdown at the same exact time, the fund would be exposed to approximately 16 percent risk. This again is highly unlikely since the probability of all four methods going into the largest drawdown at the same time during any given five-year period is only a fraction of a fraction of a percent (unless all methods are based on similar logic).

Realistically, if the portfolio as a whole suffered a $20,000 drawdown, the fund would suffer a 5.3 percent drawdown. If each method produced $20,000 per contract during a 12-month period, which is not spectacular, with the Fixed Ratio money management method, the account would grow to $4.28 million or a 42.6 percent return.

Smaller CTAs use a form of the Fixed Fractional money management method as well. Compared with the larger CTAs, they are willing to risk more than a fraction of a percent on any given trade. Some smaller CTAs risk as much as 2 percent on any given trade in an effort to produce higher returns. With a 2 percent risk on a trade risking $1,500 per contract, the smaller CTA may put on one contract for every $75,000 under management. This means that the trader will

place 40 contracts on that trade. If that CTA suffers a $20,000 drawdown per contract, he is looking at upward of a 25 percent drawdown of the fund. On the flip side, if each method produced $20,000 per contract of profits, the return would be well over 100 percent for the year.

However, if the goal is higher profits and higher risks, the smaller CTA would be in a much better position by further diversifying the risk instead of lumping contracts on the current methods. Conceivably, the trader can have 15 different trading methods divided into 5 different portfolios of 3 methods per portfolio and trade 8 contracts in each portfolio. If each portfolio went into a drawdown of $10,000 per contract being traded, all at the same time, the maximum risk would only be 13 percent. Meanwhile, if each method only produced $10,000 in a year's time ($30,000 per portfolio), the Fixed Ratio method could increase those returns to $3.5 million (116% return) with a much lower probability of exposure to high risks.

One last note of comparison: Each method in the preceding scenario only had to produce half of the profits per contract that were required in the 2 percent risk scenario. Each method in that scenario had to produce $20,000 per contract to achieve greater than 100 percent returns. If each method traded produced $20,000 in the latter scenario, the estimated profits would be somewhere around $11,560,000, or a 385 percent return. It is not probable that each method would produce those kind of returns. Rarely do all methods prove profitable at the end of the year. However, to compare apples with apples, those are the numbers.

At the time of writing this book, I know of only one CTA who has actively sought to use the principles outlined in this book consistently within the fund. His name is John Zervas. John is fairly new and not well known in the management arena but has been trading for many years; in fact, his dad was a trader and his first mentor. John has definitely placed the emphasis on money management and regularly consults with me on how to apply the principles to increase potential for geometric growth while maintaining an extremely low risk exposure.

Most likely, other CTAs and CPOs will address these issues in the coming months and years. However, I am unaware of any others that apply these principles on an active basis. I have never managed money for a fund, nor do I have any desire to do so. If you are looking at different funds, I would question them thoroughly about the money management principles they currently use.

16

MONEY MANAGEMENT MARRIAGE

This chapter deals with both the Fixed Fractional and Fixed Ratio money management strategies. In previous chapters, I explained many of the drawbacks to using the Fixed Fractional money management method. Further, it was demonstrated that for most traders, including CTAs, the Fixed Ratio method was by far the better choice from a risk/reward standpoint. However, one of the drawbacks with the Fixed Fractional method can actually help one of the drawbacks of the Fixed Ratio method in the later life of a money management plan. In this chapter I discuss this relationship, why it exists, and when to use it. There are only a few times that this method is worth implementing. It is useful only when the account has built up substantial profits due to the Fixed Ratio money management method. Simply having an equity buildup, however, does not mean that this is the only option for the trader. In fact, there are sometimes better options such as the one outlined for large money managers. On the other hand, there are instances that make this the preferred choice. It is up to the trader to determine which routes to choose at this stage of the game.

To recap the drawback that prevents us from using the Fixed Fractional method from the beginning, it is the reward potential-or lack thereof-when keeping the total risk to the account relatively low. To keep the risk low through the Fixed Fractional trading method, a very low risk percentage must be applied. For example, if the trader wanted to keep the total risk of the account at 10 percent or below if a $10,000

drawdown were to be sustained, then the trader would trade one contract for every $100,000 in the account:

$$\frac{\text{Expected drawdown}}{\text{Total risk (\%)}} = \text{Minimum required equity per contract}$$

$$\frac{\$10,000}{10\%} = \$100,000$$

Therefore, the trader must have in the account as a starting balance a total of $100,000 before being able to trade even one contract. Further, that one contract has to produce a total of $100,000 in profits before contracts can be increased. The only way around this is to increase the percentage of total risk to the account. Therefore, if the trader was willing for the account to sustain a total risk of 20 percent if the drawdown reached $10,000, then the required minimum account would be $50,000 and the account would increase one contract for every $50,000 in additional profits.

There are a couple of problems with this logic when the drawdowns are actually sustained. The first is that there is no guarantee that the drawdown will not grow larger than the $10,000. It has been proven that the individual trades are independent of any other trades either prior to or immediately following such trades. Therefore, the next trade, next 10 trades, or next 100 trades do not know or care that the drawdown is at $10,000, $20,000, or even $30,000. As a result, this percentage of the account is not necessarily the maximum that the account is at risk for. It is only the amount at risk if the drawdown reaches a certain level. If the drawdown increases from $10,000 to $20,000 and the total of the account being risked at $10,000 was 20 percent, then the total being risked at $20,000 is 40 percent. This therefore must be taken into consideration when choosing the percentage at risk compared with the dollar size drawdown.

The second main problem with this method is the most obvious one. The growth potential is next to nothing. It is extremely slow and inefficient at the beginning. The first problem will never go away. It remains no matter when or how you use this particular Fixed Fractional strategy. However, the second drawback does go away. In fact, the higher the number of contracts, the less this problem exists until it is almost a reverse problem in that the growth becomes too fast. However, regardless of how fast the growth seems to be going, the total percentage of the account at risk never changes at

certain drawdown levels. It is because the problem of slow growth actually disappears that the method can benefit the use of the Fixed Ratio method later.

The reason this problem disappears is the same reason that it exists in the first place. The Fixed Fractional trading method requires that the same amount of additional profits accumulate before an additional contract is added. Therefore, the account requires an additional $10,000 in profits to increase from one to two contracts. By the time the account is trading 100 contracts, it still only needs a total of $10,000 in profits to go to 101 contracts. The ability th achieve that same $10,000 has increased 100-fold! What may have been slow in the beginning has increased in speed 100-fold at this level. This is what can be used to advantage in switching from the Fixed Fractional method to the Fixed Ratio method.

The effects of the Fixed Ratio method are almost exactly opposite that of the Fixed Fractional method. The Fixed Ratio method allows for the increase in contracts at the beginning to be much faster than the Fixed Fractional method. However, if $5,000 is required to increase from one to two contracts, the ability to achieve that $5,000 remains constant because the requirement is $5,000 per contract being traded. Therefore the rate of growth never increases or decreases. It remains constant.

First glance would indicate that since the rate of growth remains constant the total risk on the account would remain constant as well. This, however, is not the case. After the fifth or sixth increase, depending on the relationship between the delta size and the expected drawdown, the total risk of the account actually decreases. Recall that the risk from trading the Fixed Fractional method remains the same even though the growth rate increases. It is therefore impossible for the risk to remain the same when the growth rate actually stays the same. According to this logic, the risk must decrease:

Fixed Fractional method = Increase in growth rate with constant risk

Fixed Ratio method = Constant growth rate with decreasing risk

To illustrate this, consider the risk using a $5,000 delta after trading 8 contracts. If the expected drawdown is $10,000, then the delta to drawdown is 2: 1. To calculate the total risk at a sustained $10,000 drawdown, first calculate the bottom level of 8 contracts:

$$\left(\frac{(\text{No. of contracts} \times \text{No. of contracts}) - \text{No. of contracts}}{2}\right) \times \text{Delta} = \text{Bottom level}$$

$$\left(\frac{(8 \times 8 - 8)}{2}\right) \times \$5{,}000 = \text{Bottom level}$$

$$\frac{64\text{-}8=56}{2} = 28$$

$$28 \times \$5{,}000 = \$140{,}000$$

Next, calculate the bottom level for 6 contracts. The reason for calculating the bottom level for 6 contracts is that the delta divided by the drawdown equals the number of contracts the account will decrease during the drawdown. Since the delta size to expected drawdown is 2: 1, then the number of contracts that can be decreased during the drawdown is 2; 8 - 2 = 6.

$$[(6 \times 6 - 6) / 21 \times \$5{,}000 = \text{Bottom level for six contracts}$$

$$30 / 2 \times \$5{,}000 = \text{Bottom level}$$

$$15 \times \$5{,}000 = 75{,}000.$$

Therefore, the account is risking a total of $65,000 in profits after the $10,000 drawdown is sustained and assuming a rate of decrease of 100 percent. If the account started with $50,000 and is now at $210,000, then the total risk would be 30 percent ($65,000 / $210,000 = .30 or 30%). The top level for 8 contracts is $180,000 plus the starting balance of $50,000 means the increase would occur at $230,000. This is calculated by changing the minus to a plus in the equation:

$$[(8 \times 8 + 8) / 21 \times \$5{,}000 = \$180{,}000 + \$50{,}000 = \$230{,}000$$

The calculation for the exact middle of the bottom level of 8 and top level of 8 leaves the plus or minus completely out of the equation:

$$[(8 \times 8) / 21 \times \$5{,}000 = \$160{,}000 + \$50{,}000 = \$210{,}000$$

This amount is what is used for the account balance. Therefore, the risk calculation is a worst-case scenario since we used the lower level of the 6-contract level instead of the middle-6-contract level.

Now, double the number being traded to 16 contracts. Even though the number of contracts has doubled, the rate of growth has remained the same. The relationship of the delta size to potential drawdown has also remained the same. Therefore, if the $10,000 drawdown is sustained, the account will still only drop 2 contracts:

16 x 16 – 16 / 2 x $5,000 = Bottom level for 16 contracts

16 x 16 – 16 = 240

240 / 2 x $5,000 = $600,000

Now calculate the bottom level for 14 contracts:

14x14-14/2x$5,000=14x14-14=182

182 / 2 x $5,000 = $455,000

Adding the $50,000 original starting balance to the $600,000 brings the account to $650,000 while risking $145,000 of that balance ($600,000 – $455,000 = $145,000 at risk). This lowers the risk from 30 percent down to 22 percent ($145,000 / $650,000 = .22).

At 24 contracts, the risk is lowered to 15 percent of the account and 30 contracts brings the risk down to 12 percent. At 100 contracts, the risk is lowered to less than 4 percent of the total account. The reason the risk continues to lower is because the percentage of contracts lowered to the total number of contracts being traded also lowers. At 8 contracts, a drop of 2 contracts calculates to a 25 percent drop in the number of contracts being traded. At 16 contracts, a drop of 2 contracts came to only a 12.5 percent. By the time 100 contracts are being traded, a 2-contract drop only constitutes a 2 percent drop in the number of contracts being traded. Therefore, after the trader has traded a certain number of contracts, the risk curve is continuous to the downside.

By most counts, this is not a drawback to the Fixed Ratio method. The growth rate stays the same while the risk decreases. It sounds great, and for that matter, is great. However, there is a trade-off. The geometric effect is also diminished as the risk diminishes. For example, when the number of contracts increased from 8 to 16, the number of contracts doubled. The total profits during the first eight increases came to $140,000 minimum profits. During the next eight increases, however, the profits soared to $460,000 (bottom level of

16 -bottom level of 8 contracts = $460,000). The number of contracts doubled but the amount of profits increased by 328 percent. The profits from the first 16 increases totaled $600,000. The total profits from the second 16 increases totaled $1,880,000. The number of contracts doubled but the profits increased by 313 percent. However, the size of the profits increased 328 percent by doubling the contracts once, but doubling the contacts again increased the profits only 313 percent-a 15 percent slowdown. The first 32 increases yielded $2,480,000 in profits but the second 32 increases yielded $7,600,000 in profits. The number of contracts doubled, but the number of profits increased by 306 percent-another 7 percent drop in growth.

This is the trade-off. Yes, it is extremely small, but in the long run, it can make a difference if the number of contracts continues to increase. Compare the previous results with how the Fixed Fractional method increases growth percentages.

The Fixed Fractional example used here is one contract for every $10,000 in the account. For the account to trade 8 contracts, a total of $80,000 must be in the account. Double the number of contracts to 16 and the minimum account required is at $160,000. The number of contracts doubled as did the profits. At 32 contracts, the minimum account balance required is $320,000. The number of contracts doubled as did the number of profits. You may be saying, "Wait a minute, the Fixed Ratio method was increasing profits by 300 percent + not only 200 percent." This is true; however, a one-contract increase with the Fixed Ratio method is synonymous with an equal increase in the number of profits per contract. From one to two contracts required a $5,000 increase per contract. An increase from 99 to 100 contracts required a $5,000 increase per contract. The Fixed Fractional method is not on a per contract basis. Therefore, we must compare the Fixed Fractional increases with the number of profits produced on a per contract basis. From 8 to 16 contracts with the Fixed Ratio method, there was a $40,000 increase per contract (8 contracts x **$5,000 = $40,000).**

At 8 contracts with the Fixed Fractional method, an additional $40,000 increase based on a single contract would put the number of contracts at 480 with an account of $4,800,000. The first 8-contract increase required $27,179 to reach. By doubling the required single-contract performance of $27,179 to $54,358, the profits grew from $80,000 total to $1,200,000-an increase of 1,500 percent. Doubling the per contract requirement to $108,716, the total profits generated would increase to over $100,000,000, while trading over

10,000 contracts. Instead of dropping from a growth rate of $1,500 percent, the growth rate increased to over 8,300 percent. You get the picture.

This example of the Fixed Fractional method is so unrealistic that there is no way it can ever be implemented at these levels. However, trading one contract for every $10,000 is a far cry from trading one contract for every $100,000. To reach a total of 20 contracts with this Fixed Fractional would take a single contract performance of $360,000, whereas in the Fixed Ratio method it would only take $100,000. To increase from 20 contracts to 21 contracts with the Fixed Fractional method would require an additional $5,000 based on a single contract performance. To increase from 20 to 21 contracts with the Fixed Ratio method would also require an additional $5,000 per contract performance. Therefore, at the 20-contract level, these two methods cross. From 19 to 20, the Fixed Fractional required an additional $5,263 per contract. However, the Fixed Ratio still required only an additional $5,000. To increase from 21 to 22 contracts, the Fixed Fractional method required only $4,762, while the Fixed Ratio method still required $5,000.

To look at it another way, at 20 contracts, the total risk would be 10 percent if a $10,000 per contract drawdown were to be sustained in the Fixed Fractional method. In the Fixed Ratio, however, 20 contracts would be risking 18.5 percent. Therefore, this is the area at which the rate of growth in the Fixed Fractional method surpasses the rate of growth with the Fixed Ratio method. Worded another way, the Fixed Fractional method can be implemented at this point and level off the total risk to 18.5 percent of the account.

This leads us into the marriage of the Fixed Fractional method and the Fixed Ratio method. At one point, it is better to switch from trading the Fixed Ratio method to the Fixed Fractional method. This point can be determined logically in one of two ways. The first way has already been explained. The growth rate of the two methods cross, then the switch can take place. The growth rate switch of the example given came at 18.5 percent. However, you can switch according to the risk percentage instead of the growth rate. If you wanted to use the Fixed Ratio method until the risk was lowered to a constant 12 percent should a $10,000 drawdown per contract be sustained, then the switch would not occur until the Fixed Ratio level of increase crossed that risk level of the Fixed Fractional increase. This means that the Fixed Fractional method would increase one contract for every $83,333. The Fixed Ratio method would increase one contract for every $5,000 as

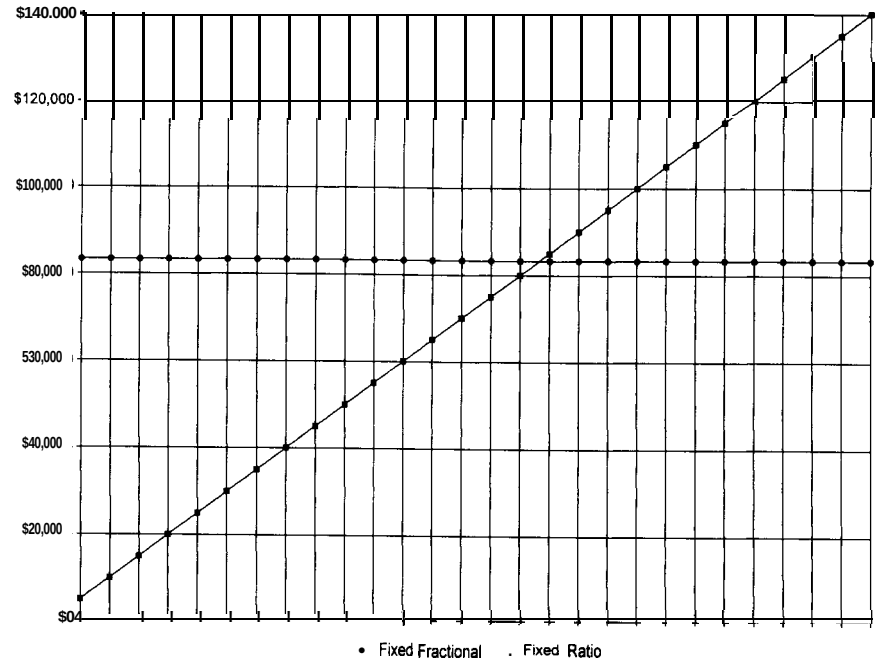

Figure 16.1 Fixed Fractional/Fixed Ratio crossover.

before but would reach the risk level of no more than 12 percent at 29 to 30 contracts. This is the level at which the account balances cross in Figure 16.1.

The vertical axis in the figure represents the Fixed Fractional calculation that equals one contract for every $83,333. This allows for a very low risk level but from the beginning, almost impossible to implement. Notice that the straight horizontal line never changes. The horizontal axis at the bottom represents the Fixed Ratio method using a $5,000 delta. Notice that the line slopes to the upside as more contracts are being traded. This line represents the increased capital required to add on each additional contract. At approximately contract number 17, the methods cross. This is the level at which the growth factor becomes more potent with the Fixed Fractional method than with this level of the Fixed Ratio method.

17

PUTTING IT ALL TOGETHER

Throughout this book, there is practical information that you can apply to your trading. For some, this information may all be new and eye-opening. For others, it may be confirmation of many previous thoughts and ideas. Regardless, the information is useless unless you apply it in actual practice. My goal in this chapter is to help you accomplish this goal.

It has been said that when you plan a vacation, where you are going and when you will get there are not nearly as important as where you are starting from. If you don't have that piece of information, you have no clue about the direction you need to take. Trading is much the same way. Many traders develop halfhearted goals because they have no clue how to reach those goals. Part of the problem is that they are unsure that they have started in the right direction. It is like being in the middle of nowhere, having somewhere to go, and hoping you are moving in the right direction. Most traders are not moving in the right direction.

When traders call me and begin to tell me that they have certain goals in trading, invariably I ask if they have developed a plan to achieve these goals and the answer has always been "no." I often tell traders that before developing a plan, they need to completely stop trading. Clear the account of all open positions so that when the plan is developed, they know exactly what they are starting with. For some, this is not needed. For most though, it is where to start. Some traders are amazed at what they are doing when they step back and look at things. Most are overtrading, trading by the seat of their

pants, or trading blind hope systems. The following is a step-by-step guide to developing your own trading plan.

TAKE AN ACCOUNT OF WHAT YOU HAVE DONE

After you have completely stopped trading, go back to the very first day you ever laid eyes on the market and write down the methods, systems, strategies, and trades you have ever made. This does not mean list every single trade you have ever taken. However, if you have ever opened an account for the sole purpose of writing options, summarize the experience. Write down as much detail as possible including what events lead you to start trading a particular method, the account size you started with, why you started with that account size, the type of trading, the frequency of trading, whether you enjoyed taking the trades (or hated it). Write down how long you traded the method, whether you stuck with it, (if not, why), the size of drawdowns as well as drawups. Don't forget to include time variances. How long did the drawdowns last compared with the drawups? How long did you stick with the method? Finally, write down when you quit trading the method, what the final outcome of the experience was (gain/loss) and what you did with the account afterward.

Once you have done this for every single experience, consider the mistakes that you made over and over again. Some traders never ever stick with the method. Others simply get distracted by other "things" to do in the market. Regardless, you will know where your weaknesses and strengths are in trading after completing this summary. You will also know which type of trading you enjoyed the most. Some enjoy winning often and don't mind a big loser every now and then. Others like longer term trading, and still others like being able to research every single trade before placing it. Later when finalizing your plan, you will be able to look back at this and determine what type of trading you should be doing.

WRITE DOWN YOUR GOALS

Now that you have written down what you have done, write down what you would like to accomplish. These goals are not just how you would like to become a millionaire in the next 12 days. They must be

much more specific than that. Goals begin with how much capital you are starting with. When you have a goal of making $1 million in the next five years, is that goal to reach $1 million risking the entire starting account to achieve it, or do you only want to risk 50 percent of the account to achieve the goal? The risk tolerance becomes part of the goal.

The goal may also include other things such as the manner in which you want to achieve the end dollar figure. Do you want to achieve it by spending four hours a day researching the markets after you get home from eight hours of work? Do you want to be able to achieve the goal and be completely hands off for time to spend with your family? Is part of your goal to be able to quit your current job within a certain time period? These things must be taken into account. Write them all down.

Also include within the goals the sacrifices you are willing to make. No amount of wealth is worth sacrificing your wife, husband, or children, but there are sacrifices. Sacrifice the things that have little impact first. Maybe you will have to cut out your three golf games a week or soups at lunch. These sacrifices may only be temporary until things get rolling smoothly, but be prepared to make them. My former boss at the law firm, Fred Stoops, used to say, "If you do what you have to do when you have to do it, then you will be able to do what you want to do, when you want to do it." I have never forgotten. It goes back to the biblical principle of sowing and reaping. We do reap what we sow.

DEVELOP A PLAN OF ACTION

Thus far, you know what you have done, what you want to do and what you are willing to do to get there. Now comes the specifics. You must take the information contained in this book and make practical application with it. There are two vital areas in developing this plan. The first is the methods you will use. The second is the money management you will use.

The Methods

If at all possible, develop a diversified group of methods and markets. This may only consist of two methods and a few markets, or it may consist of many methods and many markets. Whatever you do, make

sure you do not begin the plan by overtrading at the start. Go back and reread Chapter **4** for some ideas on the starting amount needed. Make sure and double sure that you have done your research on the markets and methods you have decided to implement. One set of numbers can be very deceiving as noted in Chapter 15. The more you know what to expect, the better you will be able to prepare for it.

Later in this chapter, I provide additional information about putting together a portfolio after viewing the overall performance abilities of a particular system and market. A well-diversified portfolio may consist of one long-term trading method, one short-term trading method and possibly an options trading strategy or some other type of system unrelated to the first two. Be careful not to have too many similar strategies as you will often be on the same side of trades in both systems. If you have two systems that are longer term based on trends, drawdowns will often occur in both systems at the same time.

There is one type of trading that I recommend that every trader at least take a look at. It is what I call "easy money" trading. There are certain things in various markets that are deemed as "unusual." Often, these unusual situations provide very low-risk high-probability opportunities for the trader who is willing to watch and wait. For example, back in April 1997, I gave some interesting research facts to several of my clients on the OJ market. At the time, OJ was trading around 68 cents which is extremely low for that market. According to my research, OJ was extremely close to all-time lows when inflation was accounted for. The entire contract was worth only $10,000. According to my research, I thought there was a good probability that OJ would hit 1.30 within the following two years. I also gave some information on how to take advantage of this situation with little or virtually no risk. This trade was as close to as sure thing as there is. Sure, OJ could have gone down to 50 cents, but as long as traders took steps to prepare for such a move, they could still hang on. I further stated that if implemented properly, this trade would most likely yield far, far more than any mutual fund in the following two years with virtually no risk involved. Unlike mutual funds that could go bankrupt and actually go to zero, OJ simply will not do that. Sure enough, on October 10, 1998, OJ hit 1.30. There were a few who took advantage of this situation; they had to wait, but just when the stock market was making a huge correction and everyone was scrambling, folks in OJ were laughing all the way to the bank.

This is just one example. Another is the spread between gold and platinum. As a rule, platinum trades at a premium to gold due to a

lower supply. In January 1997, the spread between the two narrowed to almost nothing. There have been a few brief periods when platinum actually traded below gold. Nonetheless, for the few who were watching for such a situation, the spread increased from nothing to over $90 within the next few months. By selling the gold market and buying the platinum market, the profit potential within that six-month period was $9,000. It was "easy money." More recently, heating oil was heading into the winter months at 35 cents. This is ridiculously low. This is easy money. Buy heating oil and make sure that you won't have to get out should the market go to 25 cents and eventually, the market will move up, most likely to the 50 cent area. Again, with the right strategy, easy money.

I highly recommend that all traders look for these situations. They offer good profit potential with extremely low risks. They can help boost the account level which will in turn boost the effects of money management. If you would like to know more about this type of trading, I suggest you get a copy of *Smart Trading Market Letter*. It is a monthly publication that reveals these special situations as well as ideas and strategies to take advantage of them. Further, there is a CTA who trades these as well. His name is John Zervas (see discussion in Chapter 15) and you can reach him at 303-771-7711.

Money Management

The second area of developing a plan is money management. The earlier chapters in this book should give you just about everything you need to know to put together a plan for trading. The more you understand these methods, the better you will be able to apply them to your own trading. Take the time to understand them as thoroughly as possible.

Within the plan, you need to gauge the money management strategies against your goals. If you do not want to risk a lot of capital at the beginning, then you will need to be conservative with the money management strategies you implement. If you want to get to a certain point as quickly as possible while only risking X amount of the account, the money management needs to be tailored to those goals.

In this area, you have a few choices. First, you can either learn the money management as thoroughly as possible and know what you need to do for your specific goals and risk tolerances. Second, you can

plug the information into a money management program called Performance I, and it will make some suggestions for you. However, if you choose the second option and decide not to thoroughly understand the money management principles contained in this book, be prepared to follow the suggestions. I have found that many traders who do not know why they are doing something, won't do it. It is always best to understand before doing.

When developing the money management portion of the plan, be specific with every detail. Do not simply say that you are going to use a delta of $5,000 and a rate of decrease of 150 percent and let that be the end of it. Calculate specifically the levels the account must achieve to increase an additional contract. Calculate specifically the levels at which you will decrease contracts. Do not hesitate to use a more aggressive delta and rate of decrease at the beginning and then slow it down later in the plan or vice versa. If your goals are to be aggressive now, and conservative later, then feel free to change the delta midstream.

CONCENTRATE ON YOUR STRENGTHS, DELEGATE YOUR WEAKNESSES

Several years ago, I learned that I was terrible at keeping track of all the orders that had to be placed. I was also terrible at following a method precisely. I was forever trumping the signals with my own biased opinion and choosing the signals I would take and the signals I would not take. I would get out of profits early and hang onto losses far too long. Sometimes, I would just plain not take the time to make sure that the orders were all right when I called them in. Now, I realize that there are many "psychologists" out there who can help you overcome your weaknesses . . . in a few decades, but until then, delegate your weaknesses. If you can't follow a method, then have someone else do it for you. Remove yourself from the decision-making process if you can't pull the trigger. Wow, what a concept. Believe me, there are plenty of brokers who are willing to follow a method for a little extra commission. Or, it could be your wife or husband, or the fellow down the street who has always wanted to get involved but is scared to risk his own money. He may even do it for free!

When you delegate your weaknesses, guess what that leaves more time for . . . your strengths. Can you imagine Dan Marino trying to

kick a field goal? Shoot, before long, they'll have him in a wheelchair throwing passes. But he will never ever kick a field goal, or for that matter even attempt to kick a field goal. Why? Because his strength is in the quarterback position. I wonder if I could charge a fee to go out there and tell Dan that I can help him overcome his weakness in this area. We can work all week long on his field goal kicking, but come gameday, he will still be passing and someone else will still be kicking. However, because he didn't spend any time practicing on his strengths, they, too, may begin to suffer. If you spend all your time trying to overcome your weaknesses as a trader, you will never increase what is already strong. Instead, the strengths will become weaker.

PREPARE A BACKUP PLAN

The only traders who fail are traders who quit. If you develop a plan and things don't go as planned, have a backup plan. Within the original plan, you should always have room to continue trading should the original plan produce losses. For example, if you start out with a $50,000 account, be sure that you are not risking the entire $50,000 within the first plan. If you are, how can you implement a backup plan?

As a general rule, develop a portfolio that will not lose more than 40 percent of the account, worst-case scenario. Therefore, starting with $50,000, you would switch to your backup plan if the account draws down to $30,000, but plan on reevaluating strategies before reaching this level. Sometimes, reevaluating will allow you to alter the plan midgame and avoid further losses. However, know what you are looking for when you reevaluate. Sometimes, just one market or one method may be causing the trouble. Be prepared to isolate the problem and replace it first before replacing the whole plan.

Further, the backup plan needs to be more conservative than the original plan, especially if you allow for a 40 percent drop before going to the backup. If you start with a $50,000 account and drawdown to $30,000, you may only be able to implement one low-risk method across a few markets and trade the "easy money" trades. Or, you may have to take the longer term strategy that you haven't scrapped and trade mid-am contracts with it. With a backup plan, capital preservation becomes priority. He who fights and runs away, lives to fight another day. Sometimes death with the ship is not always wise. Preserving capital may limit your growth factor, but it keeps you in the game. You don't play if you are not in the game.

PREPARE FOR ADDITIONAL STRATEGIES AND MARKETS

Proper money management plans include increases not only in the number of contracts being traded, but also in the number of strategies and markets, or both. There are times when the trading account can absorb additional strategies or markets without noticeably adding to the risk. A good rule of thumb is to add to the portfolio once every 6 to 8 contract increase in the current strategies. You obviously do not have to have these strategies set in stone before you start the plan. After you have started trading, then plan on preparing for these additional strategies. You will have the time to do the research and the ability to do a thorough job.

Also, it is a good idea to explore trading strategies that are unrelated to what the plan is currently trading. If you have a longer term trend-following system and a short-term swing trading system, then look at breakout systems or the same systems in different markets. Just as in the creation of the original portfolio, diversified is the name of the game when adding strategies and/or markets later on in the plan.

OPTIMIZATION STATISTICS AND PORTFOLIOS

In Chapter 8, we saw the benefits proper money management techniques can have on portfolios. In Chapter 14, we saw how examining optimization tests a little closer can give us a more realistic picture of what to expect from system trading in the future. What we have not seen is how portfolios can increase our chances of making money through the eyes of the optimization process.

Recall a few of the final statistics given after applying 496 different combinations of a simple moving average crossover system to the bond market over an eight-year period. In this section, we will add 496 tests applied to the Swiss franc market using the same system during the same time period. The best results came from using

parameters of 8 for the short-term moving average and 49 for the long-term moving average. The statistics are shown in the box.

Net profit	$79,000
Number trades	44
Number winners	19
Number losers	25
Winning %	43%
Average win	$6,000
Average loss	$1,400
Average trade	$1,800
Win/loss ratio	4.6
Largest DD	$11,000

According to the optimization tests performed on the bond market over the same eight-year period, we concluded that we had a 62 percent shot of averaging at last $3,000 per year with that system. With the Swiss franc, there were 347 combinations that produced more than $24,000 during the eight-year period. This computes to a 70 percent chance that over the next eight-year period, we should be able to produce at least $3,000 on average per year.

Relating this information back to the coin-flipping examples, also recall that if you have two coins and flip them in the air, each coin has a 50/50 chance that it will land heads up and a 50/50 chance that it will land tails up. What are the probabilities that at least one of the two will land heads up? The four possible outcomes of the two coins are:

1. h,h
2. h, t
3. t, h
4. t, t

This means that there are three out of the four possible outcomes where heads landed up on at least one of the coins. This means that out

of two coins, there is a 75 percent chance that one of them will land heads up. If there are three coins, what is the probability that at least one of the coins will land heads up? These are the possible outcomes:

1. h, h, h
2. h, h, t
3. h ,t, h
4. t, h, h
5. h, t, t
6. t, h, t
7. t, t, h
8. t, t, t

Here, there are eight possible outcomes. Seven of those eight outcomes include at least one coin landing heads up. The answer is 87.5 percent chance. Swing this back into the probabilities of making at least $24,000 in the bond market and $24,000 in the Swiss franc market. We said that the probability was 62 percent in the bonds and 70 percent in the Swiss franc. However, our probability of making the $24,000 in at least one of the markets is 88.6 percent.

30% x 38% = 11.4% chance that both markets will not produce at least $24,000

We also added the crude oil market into the picture. In crude oil, there were 334 combinations out of 496 (67%) that made $24,000 over the eight-year period. This means that there is less than a 4 percent chance that all of them will not produce at least $24,000. Further, there is a 96 percent chance that at least one of them will produce $24,000 in profits during the next eight years.

Not only does the probability go up that at least one will profit, but the more markets, the higher the probability that more than one will produce the required amount. For example, with only two coins, there was only a 25 percent chance that both of the coins would land heads up. With the bonds and Swiss franc, there is a 43 percent chance that both markets will reach the $24,000 level. With three coins, there is a 50 percent chance that two thirds will be heads up. With three markets, there is a 64 percent chance that two of them will produce the $24,000.

Finally, we can make a probability estimate on what the chances might be for one market to make $24,000 and the other to lose $24,000. There were 20 combinations (4%) in the crude oil that produced a drawdown of $24,000 of more. In the bond market, there were 18 combinations (3.5%) with drawdowns of $24,000 or more. Therefore, there is an 88 percent chance that at least one of the markets will make $24,000 and a less than 1/5 of 1 chance (.04 x .035 = .0014 or .14%) that one of the markets will lose $24,000.

All these facts make quite a bit to sift through. What is relevant for one trader will not be for another. The basics behind these principles are applicable for every trader. How exactly to apply them to your own trading is a question you alone can answer. I highly recommend that you fully understand the principles before applying them. This may mean going over portions of the book several times. The bottom line is the more you understand the principles, the better you will be able to make practical applications with them.

A FINAL THOUGHT

If a trader follows these steps and prepares to stick with them, that trader is ahead of the game, more than 90 percent of all traders. Some traders with good intentions and a fine game plan in their head get sidetracked. Others have a game plan for trading something that they are confident will make money in the long run but feel the need to trade more actively. If you develop a plan, delegate the implementation, and still feel the need to trade, keep it separate from the plan. Open a $10,000 account and day-trade the S&P when you feel lucky if you want. But when that money is gone (and it most likely will be), do not alter the plan. Do not pollute the plan with hunches, trading tests, or other things that you have not tested or thoroughly researched. Keep focused and play to win.

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