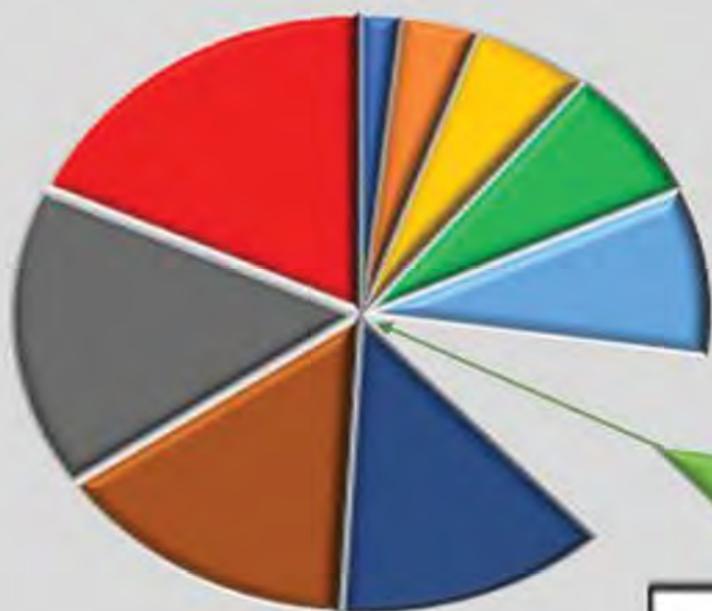
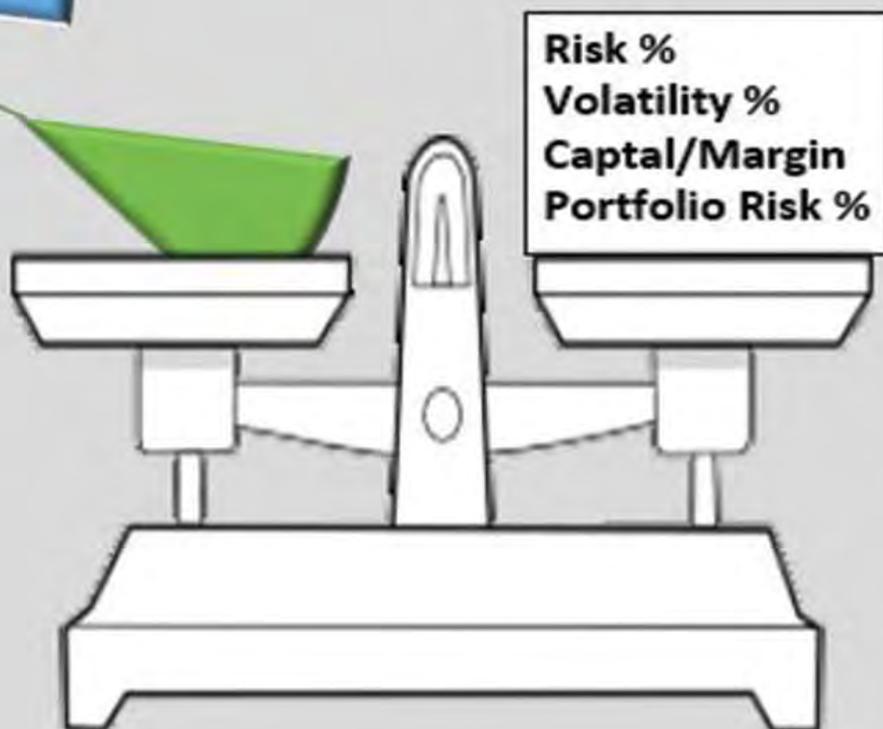


# SUCCESSFUL TRADERS SIZE THEIR POSITIONS

WHY AND HOW?



**Portfolio**



BY **TOM BASSO**

[www.enjoytheride.world](http://www.enjoytheride.world)

# **Successful Traders Size Their Positions – Why and How?**

Tom Basso

**Successful Traders Size Their Positions – Why and How? – Basso**

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**Other books by Tom Basso:**

**Panic-Proof Investing – Lessons in Profitable Investing from a Market Wizard, John Wiley & Sons, Inc., 1994**

**Putting – The Easiest Stroke in Golf, enjoytheride.world LLC, 2018**

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## FOREWORD - BY LAURENS BENSNDORP

The first time I met Tom was in 2013 in his mountain home in Payson, Arizona. I had read a lot about him already, and what struck me straight away was his relaxed attitude toward trading. We are taught by the media that a trader is supposed to be stressed, high paced, and excited when looking at his account and its equity swings. Knowing Tom, this is far from his norm. Over three decades he has managed to trade in a very profitable way, and one of the key reasons is that he is a master in position sizing. Tom wrote this excellent book on position sizing, and he is somebody who has been there and done it all through experience. He designed simple to understand algorithms that all of you can apply.

Tom explains it all in this easy-to-read book. With clear and straightforward examples, he shows you step-by-step the complete ingredients of a position sizing strategy. If I had known these concepts back in 2000, I would have been a profitable trader a lot earlier in my career. Topics range from sizing your initial position all the way to managing your ongoing risk on a continuous basis. This is a must read for every beginning and experienced trader.

In the first part of the book, Tom explains in clear language the importance of why a strategy must fit you and why you need to control the size of your positions. In my education company, the Trading Mastery School, I teach traders how to develop an automated trading strategy. I have taught a lot of people over the years, and I can tell you one very important thing: no two of these traders are equal. Everybody has different beliefs, strengths, weaknesses, risk tolerances, and objectives. Tom realizes that everyone is different and emphasizes that the strategy needs to fit you as a person. This is crucial and frequently overlooked by too many people causing them to struggle with their trading.

In chapters four through ten Tom does an outstanding job in explaining the simple math of how to size your positions starting with initial risk, volatility, and controlling your margin. This is explained with easy-to-understand examples. After reading these chapters you will have a clear understanding of how to calculate the recommended size your positions. The examples and formulas are low level math you can do on a calculator, so everybody reading this can apply these strategies to their own trading immediately.

In the next part Tom masterfully explains the importance of controlling the risk, volatility, and margin of your ongoing positions. This is incredibly important as we size our initial positions based on past volatility. However, when you are in a trade, the volatility can easily change. Imagine you are buying a stock which has been trading in a small range with low volatility. This gives you a great reward to risk setup. Then you are in the trade, and the trade is going in your favor, but the volatility is increasing rapidly. Your stop loss orders are not moving up as fast as the market. Then you suddenly have daily price movements that are 4 times the volatility of your initial position. At this point, most traders will not be able to keep their emotions and mental state normal, even when the trade is a winner.

A great real-life experience of this is shown in chapter five. Tom shows again a simple strategy for continuously controlling your ongoing risk, volatility, and margin. This is especially important for longer term positions where volatility will change over time. You must be able to stay in the trade. Applying the information Tom gives you will make the difference between staying in the trade and closing a possible very profitable trade early because you can't handle the daily equity swings anymore.

Tom also lays out perfectly the dangers of wanting to shoot for the moon through position sizing strategies like the Kelly criterion. I totally agree that it is very dangerous to do this and has a large likelihood to send your equity to ruin. Every trading strategy with buy and sell rules will have good times but also times where it just under performs. If you use a position sizing strategy

like these “get rich quick” formulas instead of properly sizing your positions for consistent good market returns, you can be wiped out in a matter of days. One of the key issues I find with traders abandoning their strategy is that it is too aggressive in its position sizing. The goal with trading is to stay in the game long term and to apply your strategy consistently. This is doable when you can handle the drawdowns with the same mental state as the sideways times and winning periods.

In chapter eleven, Tom brings up another position sizing concept based on the risk of the total portfolio and how to reduce position sizes across the board when the total portfolio’s risk gets too high. With simulation software, he shows the value added of including this in your trading strategies. Great stuff!

Finally, in chapter fourteen Tom explains the importance of the sweet spot of position sizing. This is the exact algorithm that you create for your trading strategy to help you trade according to your objectives. For Tom this means a relaxed, serene state of mind. For me it would mean that any kind of daily equity swings, up or down, do not change my mental state, my happiness, or my attitude toward trading and trading consistently. For all of you this will be different. If you apply Tom’s formulas for position sizing to your own trading, you will highly increase the odds of having a lifelong successful trading career.

Laurens Bendsorp

CEO Trading Mastery School

Author of bestseller [The 30-Minute Stock Trader](#)

## ABOUT THE AUTHOR

Tom Basso bought his first mutual fund at age 12 from funds received from delivering newspapers. In 1974, after graduating from Clarkson College of Technology (now Clarkson University) with a chemical engineering degree, he started buying stocks. Two years later he split his portfolio up and took some of his stock profits and started trading futures contracts. He received a master's in business administration from Southern Illinois University in early 80's.

In 1980, he was one of the three founders of Kennedy Capital Management and a few years later, after selling out his stake in Kennedy Capital, he became president and owner of Trendstat Capital Management which traded stocks, mutual funds and futures. As Trendstat grew, it eventually added foreign exchange programs to the mix in order to increase capacity. At the peak, the company managed roughly \$600 million for clients around the world.

Tom's experience in math and computers helped leverage the time and talents of Trendstat. His philosophy was "If it can be computerized, let's computerize it." That led to the development of what was to be a one-million-dollar research and trading platform that could handle hundreds of clients, 30 FOREX pairs, 80 commodity and futures markets, 20+ timed mutual funds using some 7 different trading strategies simultaneously.

Tom was featured in Jack Schwager's [The New Market Wizards](#) and dubbed "Mr. Serenity" by Jack. He was elected to serve on the National Futures Association board of directors in one of the three seats representing the Registered Commodity Trading Advisor industry. Tom worked to introduce standards for electronic reporting, order flow, and regulatory data to assist in developing more industry automation. He also has served on the Board of Directors of the National Association of Active Investment Managers

(NAIIM) and is a past director of CreaMiser, Inc., a small private company in Scottsdale, AZ, that is the leading provider of bulk cream dispensing in the US. He was on the Management Committee of Lamp Technologies, a Dallas-based technology company that specialized in back office-outsourcing solutions for the futures and hedge fund industry, later acquired by a bank in New York.

He has authored Panic Proof Investing which is dedicated to helping investors and Putting – The Easiest Stroke in Golf for those looking to improve their golf game. Tom has also created a website dedicated to traders: [www.enjoytheride.world](http://www.enjoytheride.world). He created the ETR Trading Tools for Excel to help traders start the process of computerizing their strategy. Tom also shot a 16-part video series that helps traders along the learning curve to developing their own personal successful trading strategy. He has been retired for about 15 years and enjoys a variety of activities, including golf, writing, cooking, singing, dancing, working out and helping fellow traders.

## INTRODUCTION

Starting with purchases of mutual funds as a newspaper delivery boy at 12, through a brief chemical engineering career and a stock portfolio, then through 28 years as a professional money manager with securities, futures and currencies, and currently as an individual investor of our retirement funds, I have seen a lot of things across the world of trading investments. I've seen academics and money managers make the investment process mysterious and complicated, intimidating many individuals attempting to manage their own portfolios and you do not need to feel overwhelmed to get started.

The concept of right sizing your position is not a new one. There will be some simple math in this book, but nothing more than you learned in 8<sup>th</sup> grade. Computers might be useful but certainly not necessary. Great books like Dr. Van K Tharp's very heavy tome: The Definitive Guide to Position Sizing Strategies – How to Evaluate Your System and Use Position Sizing to Meet Your Objectives, cover it all with lots of examples, lots of math, and prove to anyone reading it that sizing your individual positions really does matter in the markets. These books have their place for those wanting to dig into the topic, but most traders I am in contact with just want "the bottom line." This book covers my thoughts on practical ways to deal with sizing your positions, and I have tried my best to keep it as simple and practical as possible.

# CHAPTER 1 - THREE REQUIREMENTS FOR TRADING SUCCESS

## THE BUY/SELL ENGINE

It seems to me that most traders starting out tend to concentrate on what I call the “Buy/Sell Engine”. What is that? Every strategy needs a trigger to give you an action point. You really would find it very difficult to wake up every day and have no idea what and how you were going to trade that day. That approach would be worse than gambling, and the results would likely be disastrous.

These new traders head to their broker’s trading platform, look at some of the built-in indicators, or “studies” as they are frequently called, and pull up their favorite stock or futures contract and see how the indicator yields buy and sell signals over time. They ARE NOT looking at a total strategy. They ARE looking at one example of a Buy/Sell Engine. From moving averages to Keltner Bands, from range breakouts to High/Low Bands, these Buy/Sell Engines give the traders specific points in price and time to act.

While Buy/Sell Engines are fascinating to look at, they really are only the first part of successful trading. So, if you are starting out and have no idea of why you would want to buy or sell at a specific price at a specific time, start out by finding one that you understand and that matches your way of looking at the market’s movements. But once you have that, move on to more important things. I have seen traders get so mired in Buy/Sell Engines they never get to trading. They spend vast quantities of time searching for the “perfect” Buy/Sell Engine, and that does not exist.

I once spent a little time in my Trendstat Capital days creating a random Buy/Sell Engine. Every end of day, if I had no position in an instrument, I would flip the computerized coin and go buy or sell at the market then next

morning. I then used Trendstat's best position sizing techniques, outlined in this book, to manage position sizes, trailed the positions with logical stop losses and used 10 liquid markets in the futures world that provided a modest amount of diversification over many years of data. I ran the studies thousands of times since the "coin flip" would be different each time I ran the program. I created a loop that would just keep running it one more time and recorded the results from each run of the computer. The results? You wouldn't want to use a coin flip as a Buy/Sell Engine, but it was no surprise to me that, on average, this random Buy/Sell Engine, over the markets used and the period used, showed a very slight propensity to produce a profit.

## MANAGING THE POSITION AND THE PORTFOLIO

More important than the Buy/Sell Engine is the managing of the position and the portfolio. Without good position management, your results will likely be more erratic, and your risk of blowing up and having a disaster on your hands is greater. Portfolio management is the selection of what you trade in your portfolio and should not be taken lightly either. It should be obvious that if the stock market is down -25% and you are totally in large capitalized stocks, your portfolio will likely be down -25% give or take a few percent. Your ultimate returns will be heavily dependent on what you select to trade, how non-correlated the positions are, how and when you add or subtract items from the portfolio, and whether you are trading in both directions or are limited to just the buy or long side of the market.

These and many other extremely important topics in trading are covered extensively in my 16-part video series: [Creating Your Own Successful Trading Strategy](#) available at [enjoytheride.world](http://enjoytheride.world), a website I created that is dedicated to trader education and development. I cannot cover all these topics in a single book on sizing positions, but I can say that your education as a trader will never end. There are so many nuances that can help you in your success. This book is covering a few of the more important topics to success in trading that have helped me over the years.

## THE MENTAL SIDE OF TRADING

The most important part of trading and the part that can over-ride, screw-up, and otherwise sink your trading ship in how you react to your trading strategy and the markets. This is a topic that has been written about by scores of authors. Many of these books are excellent. Some were written by experts in the human mind. Suffice it to say if you aren't disciplined, principled, and prepared for the battle with the markets and yourself, you will have a difficult time being successful over the long run.

Unfortunately, this is a topic for a different book than this one, but I encourage you to look at the many books out there covering the topic of trading psychology. Recommended reading and the video series on trading can be found on [www.enjoytheride.world](http://www.enjoytheride.world).

## SUMMARY OF THE THREE PARTS OF TRADING SUCCESS

1 - You need to have a trigger called the Buy/Sell Engine. It should tell you where and when to buy or sell, set a stop or a take profit limit order. The Engine should be all about action. Turn the brain off and, like Nike used to say: "Just Do It!"

2 - You must be able to set your exposures. Selecting the portfolio, keeping it as diversified as possible, hedging it if it is necessary at times, and dealing with the size of your positions are all going to be extremely important to your success. Without these being handled well, results will suffer. This will be the focus of this book.

3 - You must be mentally ready to trade, whether short-term or long-term. Trading is trading. The time you stay in a position is immaterial to the concepts I will talk about here. If your trading psychology is not up to par, you will tend to mess up the first two parts of the trading. I consider this third part the most important part of success in trading.

## CHAPTER 2 - STRATEGY VERSUS SYSTEM

Most of the traders I am in contact with seem to talk about their “system” or want to know what “system” I use. It may be semantics, but to me, a system implies computers, math, and formulas. While all these machines and math may be useful in trading, I do not view them as essential to success. I know a lot of traders that have been successful with minimal automation. I also know a lot of other traders, including myself, who have automated parts or all their process to help their success.

The point is that the word “strategy” is a better way to describe what you are trying to come up with in trading. The Buy/Sell Engine, the position and portfolio management and the psychology all have to part of “Your Strategy.” It may be totally non-automated, have parts of it automated, or be totally automated, but it needs to include all the essential ingredients to be successful.

### YOUR STRATEGY MUST FIT YOU

Many of the questions I get from traders every day include questions on “How does Tom Basso do this or that?” or “Can you tell me how I should trade?” I believe that trying to have everyone trade like me would be pointless. Each person reading this book is unique. You have a certain amount of capital to trade. You have a unique skill set. You have a certain fixed amount of time in your life to dedicate to creating a trading strategy and a certain fixed amount of time in a typical day to dedicate to the process of successful trading. You know a unique set of people that can help you. You may or may not be skilled in computers. You may be great at math or not. You may have more flexibility in your day or have very little room to breathe during the work day. You may have a high tolerance for risk or very little.

All those items are likely to be different than what I have in my world. I’ve

managed money all my life, have a certain set of accounts that I manage in retirement, have a fair amount of flexibility in my day, know a lot about math, statistics, computers and the markets. I understand risk and am comfortable with certain risks and uncomfortable with others. Why in the world would you try to design a strategy that exactly matches what I do? It would end in failure nearly every time, because you are not me, and your situation going into trading is different. **What you need to do to be successful is design a strategy that works for YOU.**

## COMPUTERS AND TRADING

First, let us discuss what computers are and what they are not. Computers can't do even a simple task like adding two numbers together without somebody programming them to do so. Computers are quite stupid when you get right down to it. However, when you have a repetitive task that you find yourself doing repeatedly like calculating volatility from price data, computers can be very helpful in liberating you from doing the same calculation over and over until you are bored.

There's been a lot of discussion in the media of algorithm trading and its effect on the markets. In my mind, algorithm trading is neither good or bad. It is simply the sum of all traders using computers to speed up their decision-making, placing their orders, calculating volatility and yes, their position sizing. Humans can perform complex calculations given enough time, but why do that when a computer can perform the same calculation in a fraction of the time and liberate you in the process?

If you are among those that do not own a computer, do not understand computers, and do not want to understand computers, then design your strategy around that. This book will show you how you can size your positions with a simple calculator. Don't make trading more difficult than it needs to be.

## CHAPTER 3 - WHY CONTROL POSITION SIZE?

In the title of this book I included the subtitle: Why and How Much? The why part of the question is not so apparent to the new trader. Where to buy and sell seems like the key to riches. Just find the holy grail Buy/Sell Engine, and the rest takes care of itself on the road to millions.

But there is this awkward concept of risk of ruin. If you have a stretch of enough losses in a row to cause the equity in your account to go low enough, it knocks you out of the trading game. You no longer can make the next trade, and you are no longer a trader.

There is also the issue of having the discipline to stick with your trading strategy. I know that I said that the mental side of trading has been covered in other places, but I must point out here that if you improperly size your positions this will affect your ability to be disciplined. I know from personal experience that when your positions are sized too large, you get more excited, frustrated, emotional, and exhausted when watching your account rapidly go up and down. On the other end of the spectrum, sizing the positions too small will lead to disinterest, boredom, sloppiness, and a lack of returns.

Your trading profit on a trade is the price you sell minus the price you buy **TIMES THE SIZE OF YOUR POSITION**. It does not make any sense to concern yourself with the first part and ignore the second part.

## CHAPTER 4 - CONTROLLING RISK OF YOUR INITIAL POSITION

I first started thinking about controlling risk after reading Jack Schwager's bestselling book Market Wizards. In the chapter on Larry Hite, a legendary trader with Mint Investment Management Company, Hite is quoted as saying, "Mint's objective was never to make the largest percentage return. Rather, Hite's philosophy was to aim for the best growth rate consistent with extremely rigorous risk control." Later in the interview Larry says, "So the very first rule we live by at Mint is: Never risk more than 1 percent of the total equity on any trade. By only risking 1 percent, I am indifferent to any individual trade. Keeping your risk small and constant is absolutely critical." This crystalized my thinking about tying risk to equity and the formulas shown later in this chapter were instantly visual in my brain.

The first part of sizing your position properly is some form of controlling risk. The more risk you take on in a position, the more capital you expose to loss and the more likely you will blow up and lose your capital. So what risk am I talking about and how can you use it to figure out an appropriate size when figuring out the HOW MUCH part of the sizing question?

Every strategy should have a place to get into a trade and a place to cut your losses short. Some might call it a stop loss, an initial stop or reversal of direction. No matter what it is called, it turns out to be the point at which you liquidate the new trade. The difference between where you initiate the position and where you would get out at a loss at the time of putting the trade on is the risk in that trade for one unit of the instrument you are trading. How much total risk you are willing to take on with that trading instrument dictates how many units of it to buy or sell with the upcoming trade.

### SETTING YOUR STOP BASED ON YOUR RISK TOLERANCE

I have talked to many traders who start from the amount of risk that they can tolerate and set the stop based on that amount with no regard for the market's action. My personal bias in trading, and it may not be yours, is that prices flow up and down with buying and selling pressure by the multitude of traders making trades that serve their interests. In order to balance the supply and demand, prices move up or down. Certain low levels are prices at which buyers become more interested and certain higher levels are prices that attract sellers interested in getting out of the position. That creates a logical range from high to low in that single market set by market participants.

When a trader sets the stop loss price by the amount of risk that can be tolerated, it is putting their risk tolerance over the routine action in the market. That seems backwards to me. The market does not care a bit what your risk tolerance is and is going to move up and down normally, no matter what you do. So doesn't it make sense to set the stop first by looking at normal market action and your Buy/Sell Engine, obtaining the logical price to get out of the upcoming trade, then figure out how many units of the instrument to initiate in the trade to meet your risk tolerance?

## HOW MUCH TO BUY/SELL?

Let us get into the good stuff. We now have set our stops according to our personalized Buy/Sell Engine, and we now know how much risk there is in one unit of the instruments. (I'll use dollars or \$ but any currency will do) This could be one contract in futures or one share in a stock situation. It works for a wide range of investments.

Next, we need to calculate the number of units we need to initiate. The simple formula to do this would be:

**Position size (Risk) = ( \$ Value of Equity in the account X % of the portfolio's risk allocated to this single position ) / \$ Value of the risk on the upcoming trade**

I would round the result down to the nearest whole unit since you cannot trade a half a contract in futures or 0.75 shares in the stock market. The keen observer would notice that I have included % of the portfolio's risk allocated to this single position. I haven't yet defined what that is, so let's do that next.

Risk allocation to a position is a personal decision. If you allocate a large percent of your portfolio's risk to a single position, the position could go against you and materially harm the portfolio. If you allocate an extremely small percent of the portfolio's risk to one position, that position will likely not be able to materially affect the portfolio's returns. So, the problem to solve is to locate where the comfortable point is where each position is meaningful but not dangerous to the portfolio's health.

I try to keep things as simple as I can. I find it keeps life easy. I'm going to give you several levels you may want to consider. If you are a complete novice to trading, start out at no more than 0.5% of the equity in your account. You will already have enough stress and excitement just trying to figure out your next trade and getting the orders correct without adding to the excitement of making or losing a lot of money.

If you have some trading experience and are a medium to longer term trader, somewhere around 1% of the portfolio's risk may go to a single position. You will generally have meaningful positions while keeping those huge drawdowns at bay.

Only if you have the risk tolerance, lots of discipline and experience, and willingness to risk some larger swings emotionally should you head up to the 2% area. If you have twenty positions in the portfolio, and they all go to their stops, that would equal a 40% drawdown, something I find few would tolerate.

To keep things simple, I am going to use a 1% allocation of risk to any one position. Here's a theoretical example to show how simple this is:

**Equity = \$100,000**

**Percent risk allocation to a single position = 1%**

**Price to buy XYZ stock = \$20.50, Stop loss price on XYZ = \$19.05**

**Risk \$ = 20.50 – 19.05 = \$1.45**

**Position size by risk = (\$100,000 X 1%) / \$1.45 = 689.66 shares, rounded down to 689 shares**

Back in the day before computerized trading, you would be concerned about trading the odd lot shares of the last 89 shares, but in today's world, with trading commissions so small and bid/ask spreads so tight, you can trade odd share amounts with ease.

Now let us look at an example in futures:

**Equity =\$100,000**

**Percent allocation to a single position = 1%**

**Price to buy Gold futures in March = \$1275, Stop loss on March Gold = 1267.50**

**Risk \$ = \$1275 - \$1267.50 = \$7.50/contract X \$100 per full point move in gold = \$750**

**Position size by risk = (\$100,000 X 1%) / \$750 = 1.33 contracts, rounded down to 1 contract**

## INTRODUCTION TO STOCK SIMULATIONS ON RISK ALLOCATION

The following table shows a fixed 100 shares of each stock base case, and equal \$ sizing case with 20 positions and various initial risk allocations dialed in at progressively more aggressive allocation percentages. In this example on stocks I used a portfolio of 20 stocks selected from a 100-million-dollar capitalization universe trading at least 500,000 shares per day and at least 10 million dollars per day. The list of stocks includes those stocks that may have



5% Allocation	\$100.0	\$290.4	+9.41%	-41.4%	40.3	0.23	0.65
<b>*Risk 0.5%</b>	<b>\$100.0</b>	<b>\$288.3</b>	<b>+9.34%</b>	<b>-41.3%</b>	<b>37.3</b>	<b>0.23</b>	<b>0.65</b>
Risk 0.6%	\$100.0	\$342.8	+10.95%	-47.5%	37.4	0.23	0.66
Risk 0.7%	\$100.0	\$401.7	+12.45%	-53.1%	37.5	0.23	0.66
Risk 0.8%	\$100.0	\$465.5	+13.85%	-58.3%	37.7	0.24	0.66
Risk 0.9%	\$100.0	\$528.3	+15.07%	-63.1%	39.3	0.24	0.66
Risk 1.0%	\$100.0	\$588.4	+16.13%	-67.5%	57.2	0.24	0.66

## ANALYSIS OF VARIOUS SIMULATIONS ON RISK – STOCKS

The base case is a place to start, but not even close to what you would want to use for your trading. By fixing the shares to 100 shares, some positions with a higher market price will be grossly over-sized in the portfolio. I limited each position to 10% of equity and limited the portfolio no more than 20 stocks, but it still shows a lack of consistency, poor return to risk ratios and a drawdown (47.1%) that would scare even the seasoned trader.

The next simulation is the 5% of equity allocation case. It shows a slight improvement over the base case. At least here we are getting each position to start out at a consistent percent of the entire portfolio (5%) and many times holding 20 positions. Return has moved up from +7.42% to 9.41% with similar drawdown. Improvements in the MAR ratio and the Modified Sharpe would indicate an improvement in the return to risk ratios as well. The drawdown has been reduced and the time spent in the longest drawdown was reduced as well. This would not be a very robust position sizing strategy but is an improvement over our base case.

The rest of the cases vary initial risk percent allocation for each initial position from 0.5% to 1%. As expected, the lower allocations percentages yield lower returns and the higher allocation give us higher overall returns. But look at the rest of the metrics. I've starred (\*) the 0.5% risk allocation

percentage case for a reason. It has a better return than base case, a smaller maximum drawdown, a shorter longest drawdown, and higher return to risk measurements. **In summary, using a 0.5% risk percent allocation for each new position has improved the returns and made it easier for us psychologically to trade the strategy.**

## INTRODUCTION TO FUTURES SIMULATIONS ON RISK

The following table shows a base case of a fixed one contract of each futures market traded. This creates my base case in order to work with risk allocations percentages and see the effects. I used a portfolio of the 19 futures markets that I currently trade daily at the time of this writing. The list of markets includes items from meats, grains, debt, currency, metal and softs. I used CSI (Commodity Systems Inc.) as my data source on the futures data. I allowed the margin to equity to be anything up to 100% of the equity just to keep it free of restrictions.

For a Buy/Sell Engine, I used my own time-tested range breakout strategy. It is not anything special. It is a simple trend following model and many other range-based trend following models should produce similar results. You buy as the market goes through the top of the range and sell when it goes through the bottom of the range. In all the examples I used this same exact simple trend following engine and setup to compare the effects of various sizing approaches.

I used \$500,000 as a starting equity knowing full well that many of you will have less than that amount to start. As I mentioned above in the stock sizing examples, smaller equity sizes will have some of the positions drop out and performance will suffer. The larger the size portfolio you have, the more sizing algorithms will have a positive effect to a point. At \$500,000 for these futures examples, we should be able to see clearly the effects of various sizing approaches.

## VARIOUS SIMULATIONS USING RISK ALLOCATION PERCENTAGES – FUTURES

Title of Case	Starting Equity \$K	Ending Equity \$	CAGR%	Maximum Equity Drawdown%	Longest Drawdown (Months)	MAR Ratio	Modified Sharpe Ratio
1 Contract	\$500.0	\$686.6	+2.78%	-14.6%	83.8	0.19	0.47
Risk 0.4%	\$500.0	\$731.4	+3.31%	-11.7%	25.8	0.28	0.60
<b>*Risk 0.5%</b>	<b>\$500.0</b>	<b>\$828.3</b>	<b>+4.41%</b>	<b>-13.8%</b>	<b>20.5</b>	<b>0.32</b>	<b>0.62</b>
Risk 0.6%	\$500.0	\$900.1	+5.15%	-18.1%	21.1	0.28	0.56
Risk 0.7%	\$500.0	\$977.3	+5.90%	-20.8%	66.2	0.28	0.54
Risk 0.8%	\$500.0	\$1081.3	+6.82%	-23.2%	52.3	0.29	0.55
Risk 0.9%	\$500.0	\$1193.9	+7.73%	-25.6%	52.3	0.30	0.56
Risk 1.0%	\$500.0	\$1215.5	+7.89%	-29.1%	73.6	0.27	0.52

## ANALYSIS OF VARIOUS SIMULATIONS ON RISK - FUTURES

The base case in the first line is a place to start but not even close to what you would want to use for your trading. By fixing the number of contracts to one contract, some positions with a larger contract size will be grossly over-sized in the portfolio, while smaller contracts will have limited effect. In addition, over the years there will be no compounding to larger positions sizes as the equity in the account grows.

This very simple Buy/Sell Engine historically did 1638 trades across 19 markets with a 38.6% reliability. The average winning trade was 0.39% while the average loser came in at -0.22%. The track record had a rough period from 2009 through 2015, then a fantastic spurt of growth, then more

sideways action the last year and a half. The simulation showed a lackluster return, poor return to risk ratios, a drawdown of -14.6%, and a longest drawdown of 83.8 months. I cannot imagine any trader sticking to the plan after 6 <sup>3</sup>/<sub>4</sub> years spent in a drawdown.

The rest of the cases vary initial risk percent allocation for each initial position from 0.4% to 1.0%. As expected, the lower allocations percentages yield lower returns, and the higher allocations give us higher overall returns. However, the rest of the metrics are very important as well. As the allocation levels go up, the return to risk measurement peaks and starts declining. As allocations increase, drawdowns worsen, and time spent in the worst drawdown increases. The case I would feel most comfortable with is starred. In my view of trading, this case would be the easiest to stick with over the long run. The overall returns for that period with that portfolio are somewhat lackluster, but the drawdown tolerable and the return to risk ratios okay.

## CHAPTER 5 - CONTROLLING VOLATILITY OF YOUR INITIAL POSITION

In the last chapter we sized the positions using risk percent of equity as the limiting variable. In 1987, I had a personal trade that gave me another tool in my position sizing: volatility. With an account value of around \$130,000, I went long several silver contracts. Fortunately for me, the silver market exploded. Over the next few weeks, the \$130,000 was now \$500,000. I was calling my broker every hour or two, couldn't focus on work, had a hard time sleeping, and was emotionally involved with the trade. I was no longer managing a "portfolio." I was managing a silver position and a few other inconsequential investments. Eventually the silver market caved in, I lost back most of the profit, still ending up with a \$250,000 portfolio and feeling lucky to have escaped a potential disaster.

What did I learn from this real-life experience? I have always been a trend follower. The mantra of "let your gains run and cut your losses" is something I live by in trading. In my early years I could not wrap my head around taking profits early or setting profit targets. My objective in trend following is to get into the position and ride it to wherever it was going. I once heard a new trader ask a famous trader, Ed Seykota, "What is your price objective when you get into a new trade?" Ed's answer, which I laugh about to this day was, "When I get into a new trade, my objective is to stay in the trade and ride it to the moon if it wants to go there. I've never had one do that yet, but I keep hoping someday one will." That is the old trader's axiom "Let your profits run, cut your losses short." I followed that axiom to the letter, but that one silver trade shook me so much I started thinking about the size of the position I was trading.

The risk of the position was not the problem. I had a well-defined stop loss point and had the correct number of contracts for the risk I wanted to take on. However, the volatility of that market when I got into it was not at all

considered. Volatility is wonderful to the portfolio when it is going our way and can be gut wrenching when it is going against us. Volatility is movement and the faster and farther prices move, the more it hits your psychology and tempts you to abandon your strategy. The smoother an investment moves, the more likely the trader is to stay the course and let the market feed the portfolio profits.

## A SIMPLE WAY TO CALCULATE VOLATILITY IN A POSITION

The first question that comes to mind is how can we come up with a simple way to measure volatility. There are two widely used measures for volatility: implied volatility using options and Average True Range (ATR) which uses the prices of the instrument to be traded. Working with options is more difficult than working with prices, so I prefer the simple ATR approach to volatility. I trade stocks, exchange-traded funds, and futures and having one approach that can be used across all my investments makes a lot of sense to me.

First, let's make sense of True Range. The True Range of a financial instrument is the widest range of prices the instrument has travelled over a period. To keep it simple I will use daily data as my example, but any period from 1 minute to monthly could work using this approach to volatility.

You start with the price at the end of the day. You then open the next day unchanged, up or down, then prices go all over the map during the day, and that market closes at the end of that day. The highest price over that entire 24-hour period is the high of the range. The lowest price over that entire 24-hour period is the low of the range. The True Range of that day then is the range from the high of the period minus the low of the period. The formula for a spreadsheet or your calculator would look like:

**True Range of a day = Maximum(Yesterday's Close, Today's High) – Minimum(Yesterday's Close, Today's Low)**

Next, we need to average these True Ranges since any one day could be very volatile or not move at all. I use 21 days (about a month of trading days) for a lot of my indicators, but you can dial it in wherever you would like to. If you were a day trader, you could use 12 5-minute bars or if trading weekly, perhaps something like a 10-week Average True Range. The important concept here is to dial it in for your trading strategy, not mine. I use an exponential moving average for the convenience of the calculation, but you could use a lot of other averages and get similar results. Once again, I am trying to make it easy to calculate and trade the markets.

**Exponential Average Factor = 2 / (number of periods + 1)**

Then Average True Range would be:

**Average True Range (21 days) = Yesterday's ATR + (Expo. Avg Factor X Today's True Range)**

## SIZING YOUR INITIAL POSITION USING VOLATILITY

Now we have an easy calculation of the volatility of everything we intend to trade. Next, we need to create a simple way to size our positions using volatility. We know that too much volatility would be stressful or emotional and too little would be boring with low returns. So how are we to use our easy measure of volatility to size our positions to suit our trading?

Using a similar approach to what we did in the last chapter on controlling risk as a percent of equity, we can create a calculation to limit the volatility allocation to a percent of equity. The simple formula to do this would be:

**Position size (Volatility) = ( \$ Value of Equity in the account X % of the portfolio's volatility allocated to this single position ) / \$ Value of the ATR on the instrument in the new trade**

Just like in the risk calculation I would round the result down to the nearest whole unit since you cannot trade partial shares or contracts. Once again, we need to think through what percent allocation a single position's volatility should be of the total portfolio's equity.

Volatility allocation to a position is another personal decision. The higher each position's volatility allocation is, the more profits or losses you will see. Too much percent of equity allocated to a single position, and you are increasing the risk of ruin and testing your discipline and mental side of trading. Too little allocation and you hurt the returns and produce more stability and boredom in the portfolio. You must find the sweet spot between too much and too little volatility in each position. Since volatility over the years is constantly changing, so will be the number of positions traded to keep the positions and the portfolio steadier in its speed of movement.

Simple is good. As in risk, I will mention several levels you may want to consider. If you are new to trading, start out at no more than 0.5% of the equity allocated to each position in your account. This will help keep down the stress of the position as you concern yourself with all sorts of other unfamiliar things that you must deal with as you learn how to trade.

If you have some trading experience and are a medium to longer term trader, somewhere around 0.75% of the portfolio's volatility may go to a single position. You will generally have meaningful positions while keeping those huge drawdowns at bay and movements tolerable.

Only if you have the tolerance for large days up and down, and lots of discipline and experience should you head up to the 1-2% area. If you have twenty positions in the portfolio, you allocate 1% to each of them, and they all move a "normal" day of ATR volatility in the same direction, that would equal a 20% move in one day! That would be great if moving in your direction, but a stressful day if it went against you. Fortunately, if the portfolio is well diversified, rarely would each position go in your direction

or against you at the same time as every other position in the portfolio; therefore, you usually get a lot less movement in the portfolio than the theoretical example of summing all the volatilities.

Also remember that the Average True Range is just that; AN AVERAGE! This means that on any given day the True Range could easily be more than the average. Think ahead to a volatile day and ask yourself how much movement in one day would get into your head and cause you to move away from being a disciplined trader and into an emotional state not conducive to trading. Back off that allocation when selecting your own percent target for each position, and give yourself some breathing room.

To keep things simple, I am going to use a 0.75% allocation of volatility to any one position. Here's a simple theoretical example to show how simple this is:

**Equity = \$100,000**

**Percent risk allocation to a single position = 0.75%**

**Volatility (ATR(21) of XYZ stock = \$0.85**

**Position size by Volatility =  $(\$100,000 \times 0.75\%) / \$0.85 = 882.35$  shares, rounded down to 882 shares**

Now let us look at an example in futures:

**Equity = \$100,000**

**Percent allocation to a single position = 0.75%**

**Volatility (ATR(21) of Gold futures in March = \$3.60**

**Volatility \$ =  $\$3.60 / \text{contract} \times \$100$  per full point move in gold = \$360**

**Position size by Volatility =  $(\$100,000 \times 0.75) / \$360 = 2.08$  contracts, rounded down to 2 contracts**

INTRODUCTION TO STOCK SIMULATIONS USING VOLATILITY

## ALLOCATION

The following table once again starts with a fixed 100 shares of each stock base case, and equal \$ sizing case with 20 positions and various initial volatility allocations dialed in at progressively more aggressive allocation percentages. I used the same universe of stocks and identical Keltner band Buy/Sell Engine as in the risk allocation examples, but I'll spare you the waste of time repeating that. I still allowed any one position to be up to 10% of the portfolio or twice the 5% of portfolio you would get if everything were equally sized with 20 positions. This allows a position's size to grow a little if profitable or extremely low risk. The simulations started at the same \$100,000 starting equity.

### VARIOUS SIMULATIONS USING VOLATILITY ALLOCATION PERCENTAGES - STOCKS

Title of Case	Starting Equity \$K	Ending Equity \$	CAGR%	Maximum Equity Drawdown%	Longest Drawdown (Months)	MAR Ratio	Modified Sharpe Ratio
100 shares fixed	\$100.0	\$233.5	+7.42%	-47.1%	64.2	0.16	0.57
5% Allocation	\$100.0	\$290.4	+9.41%	-41.4%	40.3	0.23	0.65
Vol 0.5%	\$100.0	\$320.3	+10.32%	-38.0%	39.1	0.27	0.71
<b>*Vol 0.6%</b>	<b>\$100.0</b>	<b>\$373.9</b>	<b>+11.77%</b>	<b>-43.6%</b>	<b>37.8</b>	<b>0.27</b>	<b>0.70</b>
Vol 0.7%	\$100.0	\$428.1.7	+13.05%	-48.5%	37.8	0.27	0.69
Vol 0.8%	\$100.0	\$479.4	+14.14%	-52.9%	37.8	0.27	0.69
Vol 0.9%	\$100.0	\$514.8	+14.82%	-56.4%	37.9	0.26	0.68
Vol 1.0%	\$100.0	\$541.0	+15.30%	-59.0%	39.1	0.64	0.68

### ANALYSIS OF VARIOUS SIMULATIONS ON VOLATILITY – STOCKS

The base case is the consistent place to start, same as our work on risk allocations, but still not what you would want to use for your trading. By fixing the shares to 100 shares, some positions with a higher market price will be grossly over-sized in the portfolio. Metrics for this base case and the

5% allocation case are identical.

The rest of the cases vary initial volatility percent allocation for each initial position from 0.4% to 1.6%. As expected, the lower allocations percentages yield lower returns and the higher allocation give us higher overall returns but look at the rest of the metrics.

The 0.6% case is highlighted with a star. It has increased returns, better return to risk ratios, and a smaller maximum time spent in a drawdown. The maximum drawdown is better than base case and a little bit more than the 5% allocation case. Most metrics are improved. Above that volatility allocation percent, the drawdowns get worse and return to risk ratio peaks and start lower.

## INTRODUCTION TO FUTURES SIMULATIONS USING VOLATILITY SIZING

The following table shows a base case of a fixed one contract of each futures market traded. This is the same exact base case we used in sizing the initial position allocation using risk. I also used the same old trend following Buy/Sell Engine for all the cases involving futures. The same \$500,000 starting equity was also used to keep everything consistent.

## SIMULATIONS USING VOLATILITY ALLOCATION PERCENTAGES – FUTURES

Title of Case	Starting Equity \$K	Ending Equity \$	CAGR%	Maximum Equity Drawdown%	Longest Drawdown (Months)	MAR Ratio	Modified Sharpe Ratio
1 Contract	\$500.0	\$686.6	+2.78%	-14.6%	83.8	0.19	0.47
Vol 0.4%	\$500.0	\$860.1	+4.75%	-17.3%	95.3	0.27	0.49
<b>*Vol</b>	<b>\$500.0</b>	<b>\$1154.6</b>	<b>+7.42%</b>	<b>-23.9%</b>	<b>77.4</b>	<b>0.31</b>	<b>0.57</b>

<b>0.5%</b>							
Vol 0.6%	\$500.0	\$1258.5	+8.21%	-28.3%	95.2	0.29	0.54
Vol 0.7%	\$500.0	\$1216.0	+7.89%	-32.5%	94.8	0.24	0.47
Vol 0.8%	\$500.0	\$1525.4	+10.01%	-37.7%	95.3	0.27	0.52
Vol 0.9%	\$500.0	\$1655.3	+10.78%	-41.5%	94.7	0.26	0.50
Vol 1.0%	\$500.0	\$1602.6	+10.47%	-50.7%	95.3	0.21	0.47

## ANALYSIS OF VARIOUS SIMULATIONS ON VOLATILITY - FUTURES

The base case is precisely the same as the initial risk allocation analysis. The rest of the cases varied initial volatility allocation percentages from 0.4 to 1.0% of the equity for the 19 markets traded. After the trade was initiated, the position flowed up and down with the markets until the position was closed with either a profit or a loss. I highlighted the 0.5% allocation level with a star as the case that I would probably choose to use in this table. It had more return than the base case, a drawdown of only 23.9%, and improved return to risk ratios. Look at what happens at the higher allocation percentages with 50+% drawdowns, lengthy recoveries, lousy return to risk ratios, and deteriorating profits. These higher allocations are getting beyond levels that make any sense to use.

## CHAPTER 6 - CONTROLLING CAPITAL/MARGIN YOUR INITIAL POSITION

First, we talked about controlling position size by risk. Next, we showed how to create a simple measure of volatility and how to use volatility to control your position sizes. During my money management days at Trendstat, we used one additional approach to controlling initial position size: margin or capital. Many might ask why control position size with capital or margin when you may have already be controlling position size by other approaches. The answer? If you run your margin too high or use too much of your capital up with one position, you may run out of equity for other trades. It is possible for a single market to be in the doldrums with low volatility and low risk and your sizing algorithms propose large contract sizes based on risk and volatility as a percent of equity. But the margin required to put on this position is a large amount. Some markets can suddenly move large amounts so the exchange will increase margin to protect itself from sudden movement. You never want to have one of those calls from your broker asking for more money to meet a margin call due to over-extending your allocations.

Let us now discuss capital/margin position sizing and create another simple formula to calculate our position sizes using this approach. Like the simple calculations I've already given you on risk and volatility as a percent of equity, a formula can be created to propose position sizes based on margin as a percent of equity. Here are a couple of simple examples setting margin as a percent of equity to 5% maximum:

Example in stocks:

**Equity = \$100,000**

**Percent margin allocation to a single position = 5.0%**

**Price of = \$20.50**

**Position size by Margin/Capital =  $(\$100,000 \times 5.0\%) / \$20.50 = 243.90$  shares, rounded down to 243 shares**

Now let us look at an example in futures:

**Equity = \$100,000**

**Percent margin allocation to a single position = 5.0%**

**Margin for one contract of gold (exchange will change it from time to time) = \$ 3400**

**Position size by Margin =  $(\$100,000 \times 5.0\%) / \$5,000 = 1.47$  contracts, rounded down to 1 contract.**

## CHAPTER 7 – COMBINING THE APPROACHES MAKES A LOT OF SENSE

We have considered three different, simple approaches to sizing your initial position for an upcoming trade. Which one should you use? How about all of them? Trading your strategy will happen in volatile markets with larger risk, volatility, and margin requirements, and at other times occur during boring, quiet markets associated with lower risk, volatility and margin requirements. Having a way of looking at the proper initial size and dialing in that size to suit your Buy/Sell Engine, the conditions of that instrument, and the market that exists at that moment keeps you sized correctly.

In the examples I have included previously, I used the same two instruments, XYZ stock and gold, to make the calculation easy to understand. Notice that we came up with three different answers on the amount to use when entering the position. Which one is correct? All of them are giving you information. The risk calculation is giving you an indication of how high or low your risk to the stop loss is on the new trade. The volatility calculation is telling you how fast the instrument is moving up and down lately. The margin calculation is giving you an indication of what the exchanges think about risk in the instrument. All of them have their information value and can be used to help your results.

I like to perform the calculations and then take the smallest position size of the three calculations. This leaves me with the least risky position size, and I know that the other two approaches that I did not use are more aggressive position sizes right now at the time of entering the new trade. I always keep danger at bay by taking the smaller answer of the three and smoothing performance.

Here is an example of combining the approaches to sizing:

**Equity = \$100,000**

**XYZ Stock at \$20.50 per share, stop loss order at \$19.05 = \$1.45 risk**

**Initial Size by 1% risk allocation = 689 shares**

**Percent risk allocation to a single position = 0.75%**

**Volatility (ATR(21) of XYZ stock = \$0.85**

**Initial Size by 0.75% volatility allocation = 882 shares**

**Margin/capital = 5% allocation**

**Initial Size by 5% capital allocation = 243 shares**

**Minimum of (689, 882, 243) = 243 shares of XYZ for the order**

And looking at our gold example:

**Equity =\$100,000**

**Initial Size by 1% risk allocation = 1 contract**

**Initial Size by 0.75% volatility allocation = 2 contracts**

**Initial Size by 5.0% margin allocation = 1 contract**

**Minimum of (1, 2, 1) = 1 contract of gold for the initial position**

## **ANALYSIS OF VARIOUS RISK/VOLATILITY COMBINATIONS ON – STOCKS**

Sadly the simulations software I use from Trading Blox cannot run both risk and volatility allocation percentages at the same time for stock portfolios. However, at Trendstat, I can tell you emphatically that we ran those cases on our customized software. We found that combining both risk and volatility together in sizing the initial position to be beneficial. Typically you will reduce the drawdowns, improve the return to risk ratios, and improve returns.

## **INTRODUCTION TO FUTURES SIMULATIONS USING RISK/VOLATILITY SIZING**

We could not use the Trading Blox software to simulate combining risk and volatility when sizing initial positions in stocks, but I customized Trading Blox for my own futures trading and can combine them together. Because of Trendstat's research, I knew it to be beneficial, so I paid Trading Blox to build that into my version of Trading Blox. I varied both the risk and volatility percent allocations, and you can see how combining the two improves the metrics.

## VARIOUS SIMULATIONS USING RISK/VOLATILITY – FUTURES

All cases started with \$500,000 starting equity

Risk %	Vol %	Ending Equity \$	CAGR%	Maximum Equity Drawdown%	Longest Drawdown (Months)	MAR Ratio	Modified Sharpe Ratio
1 Contract	\$500.0	\$686.6	+2.78%	-14.6%	83.8	0.19	0.47
Best Risk	0.5%	\$828.3	+4.41%	-13.8%	20.5	0.32	0.62
Best Vol	0.5%	\$1154.6	+7.42%	-23.9%	77.4	0.31	0.57
Risk 0.4%	Vol 0.4%	\$670.2	+2.54%	-13.0%	43.8	0.20	0.48
<b>*Risk 0.5%</b>	<b>Vol 0.5%</b>	<b>\$832.5</b>	<b>+4.46%</b>	<b>-13.1%</b>	<b>20.5</b>	<b>0.34</b>	<b>0.63</b>
Risk 0.6%	Vol 0.6%	\$875.7	+4.91%	-17.6%	21.6	0.28	0.56
Risk 0.7%	Vol 0.7%	\$922.4	+5.38%	-19.8%	66.2	0.27	0.52
Risk 0.8%	Vol 0.8%	\$999.7	+6.1%	-21.8%	66.8	0.28	0.52
Risk 0.9%	Vol 0.9%	\$1203.0	+7.08%	-24.3%	52.3	0.32	0.57
Risk 1.0%	Vol 1.0%	\$1160.3	+7.46%	-27.7%	73.6	0.27	0.51

## ANALYSIS OF VARIOUS SIMULATIONS ON VOLATILITY - FUTURES

The base case is precisely the same as all the other simulations summaries. The rest of the cases varied initial risk and volatility allocation percentages from 0.4% to 1.0% of the equity for the 19 markets traded. After the trade was initiated, the position flowed up and down with the markets until the position was closed with either a profit or a loss. I starred the 0.5% allocation level for both risk and volatility as what I would probably choose to use in this table. It had more return than the base case, less of a drawdown, and the best return to risk ratios so far. (At the higher allocation cases there are higher returns, but deteriorating return to risk ratios with larger drawdowns, lengthy recoveries, and profits starting to suffer.) At some point these higher allocations are getting dangerous to use.

## CHAPTER 8 – VARIOUS FORMS OF EQUITY IN YOUR PORTFOLIO

In the three previous chapters we have been dividing that which we wish to control (risk, volatility, margin/capital) by equity. However, I have not specified what I mean by equity. In Tharp's Definitive Guide to Position Sizing Strategies, he does a fantastic job of talking through all the various forms of equities that traders might use and be comfortable with. I'm going to touch on them here, then tell you what I use and why.

Core Equity takes any new position and assumes it will be a loss. If you take your equity not exposed to risk and subtract any new potential orders and their associated risk, you get core equity. This should always be a smaller equity than simple Total Equity. Since it takes out some of the equity due to potential risk of new positions, it would be a conservative approach to equity and lead to slightly smaller positions sizes.

Reduced Total Equity is another similar way to go. Here you can add back into your equity profits that have been locked in with stops moving up. As risk in an existing position is reduced with movements in your direction, you have a bit more "core" equity to size that next position. This is slightly more aggressive than Core Equity above but not as aggressive as Total Equity.

So, what is Total Equity? It is the total capital your broker shows in your account. Total Equity is what I recommend using for all your position sizing needs. Why? It is the easiest, simplest approach and available live, tick by tick from your broker platforms making it the most straightforward way of approaching these calculations. In this age of instant everything and commission costs so low as to be nearly negligible, there is very little difference between the current Total Equity and Liquidated Equity (sell out the account to cash with no risk left). In addition, while Total Equity is the

most aggressive way to look at equity of the three mentioned above, if I want to make it more conservative, I simply move the percent allocations down to a lower number. It is much simpler to use this approach; I'm not sure why anyone would want to go to a more complicated method, requiring computers and additional calculations. Keep it simple!

## STARTING WITH A SMALL ACCOUNT EQUITY

The number one question I get from traders all over the world on sizing their positions is something like, "I've only got \$5,000, I'm trading 20 markets for diversification, and if I use 1% risk allocation or 0.75% volatility allocation, the answer I get is 0 position contracts in futures or very small share totals. What do I do now?" There is no easy answer to this one except to tell you that the sensible approach would be to somehow increase your trading capital. I have told countless people wanting to be full time traders to stay with their prosperous day job and save as much money as fast as possible to build up the equity number in all the calculations. Your portfolio will thank you.

If that is not a possibility and you are truly stuck with a smaller account size, then you are going to have to realize that you are compromising your sizing capabilities and likely trading at higher levels of size than preferable over the long-run, but over the short run you feel you must take the chance. Without knowing it, that's what I ended up doing, and it worked out. It could have just as easily crushed my account, and I would have had to start over again.

If you are going to trade stocks, look closely at ones that trade at lower price levels. You will more easily be able to trade a reasonable number of shares and still control your position sizes, diversification and at the same time gain experience in trading.

In the futures arena, another consideration you should look closely at is the size of the contracts and the margin required for each of them. Start your

trading with as small a contract size as you can. Below is a list of margins that I pulled from various exchanges at the time of this writing. These numbers are changing all the time, so you will have to look these up yourself, but the order of the size of the margins will tend to stay the same. I have sorted each section of the futures contracts on initial margins from low-to-high for your convenience.

<https://www.tradestation.com/pricing/futures-margin-requirements/>

Description	Symbol	Initial Margin	Maintenance Margin	Day Trad. Margin
<u>Indexes</u>				
MINI RUSSELL 2000 (CME)	RTY	\$3,905	\$3,550	25% of initial
NIKKEI (\$ BASED) (CME)	NK	\$6,160	\$5,600	NONE
MINI DOW JONES (\$5)	YM	\$6,490	\$5,900	25% of initial
E-MINI S&P 500	ES	\$6,600	\$6,000	25% of initial
E-MINI NASDAQ 100	NQ	\$8,360	\$7,600	25% of initial
VIX	VX	\$8,800	\$8,000	NONE
E-MINI MIDCAP 400	EMD	\$9,020	\$8,200	25% of initial
<u>Eurex</u>				
EURO-SCHATZ	FGBS	€ 242	€ 242	NONE
DJ STOXX 600 BANKS	FSTB	€ 831	€ 831	NONE
DJ STOXX 600 UTILITY	FSTU	€ 892	€ 892	25% of initial
EURO-BOBL	FGBM	€ 911	€ 911	NONE
DJ STOXX 600 INDST G&S	FSTG	€ 1,764	€ 1,764	NONE
EURO-BUND	FGBL	€ 2,119	€ 2,119	25% of initial
EURO-OAT	FOAT	€ 2,157	€ 2,157	25% of initial
DJ STOXX 50 INDEX	FESX	€ 2,158	€ 2,158	25% of initial
MINI-DAX	FDXM	€ 3,901	€ 3,901	25% of initial
EURO-BUXL	FGBX	€ 5,313	€ 5,313	25% of initial
DAX	FDAX	€ 19,504	€ 19,504	25% of initial
<u>EURONEXT LIFFE</u>				
THREE MONTH EURO (EURIBOR) INTEREST				

RATE FUTURES	LT2	€ 300	€ 300	None
LONDON ROBUSTA COFFEE FUTURES	RC	\$840	\$840	None
MEDIUM GILT FUTURES	H	£1,050	£1,050	None
LONG GILT FUTURES	LJ	£2,100	£2,100	None
FTSE 100 INDEX FUTURES	LZ	£2,353	£2,353	None
THREE MONTH STERLING (SHORT STERLING) INTEREST RATE FUTURES	LL	£285	£285	None
SHORT GILT FUTURES	G	£640	£640	None
LONDON COCOA FUTURES	CC3	£940	£940	None
THREE MONTH EURO SWISS FRANC INTEREST RATE FUTURES	LF2	CHF 825	CHF 825	None
<u>CURRENCIES (CME)</u>				
E-MICRO AUD/USD	M6A	\$138	\$125	NONE
E-MICRO EUR/USD	M6E	\$253	\$230	NONE
E-MICRO GBP/USD	M6B	\$264	\$240	NONE
MINI YEN	J7	\$990	\$990	50% of initial
CANADIAN DLR.	CD	\$1,265	\$1,150	50% of initial
MINI EURO	E7	\$1,265	\$1,150	50% of initial
MEXICAN PESO	MP1	\$1,320	\$1,200	50% of initial
AUSTRALIAN DLR.	AD	\$1,375	\$1,250	50% of initial
NEW ZEALAND DLR.	NE1	\$1,540	\$1,400	50% of initial
DOLLAR INDEX (ICE)	DX	\$1,815	\$1,650	50% of initial
JAPANESE YEN	JY	\$1,980	\$1,800	50% of initial
EURO CURRENCY	EC	\$2,530	\$2,300	50% of initial
BRITISH POUND	BP	\$2,640	\$2,400	50% of initial
SWISS FRANC	SF	\$2,860	\$2,600	50% of initial
<u>INTEREST RATES (CBOT)</u>				
EURODOLLAR (CME)	ED	\$165	\$150	NONE
2-YR T-NOTE	TU	\$539	\$490	50% of initial
5-YR T-NOTE	FV	\$748	\$680	50% of initial
10-YR T-NOTE	TY	\$1,155	\$1,050	50% of initial
Ultra 10-YR NOTE	TEN	\$1,705	\$1,550	50% of initial
30-YR T-BOND	US	\$2,805	\$2,550	50% of initial

Ultra 30-YR T-BOND	UB	\$4,015	\$3,650	50% of initial
<u>METALS</u>				
MICRO GOLD (COMEX)	MGC	\$341	\$310	NONE
MINI SILVER (ICE)	YI	\$861	\$783	50% of initial
MINI GOLD (ICE)	YG	\$1,255	\$1,141	50% of initial
PLATINUM (NYMEX)	PL	\$1,870	\$1,700	50% of initial
COPPER (COMEX)	HG	\$3,410	\$3,100	50% of initial
GOLD (COMEX)	GC	\$3,740	\$3,400	50% of initial
SILVER (COMEX)	SI	\$3,960	\$3,600	50% of initial
PALLADIUM (NYMEX)	PA	\$7,150	\$6,500	50% of initial
<u>ENERGIES (NYMEX)</u>				
E-MINY NATURAL GAS	QN	\$1,568	\$1,425	NONE
E-MINY CRUDE OIL	QM	\$2,352	\$2,138	50% of initial
E-MINY HEATING OIL	QH	\$2,420	\$2,200	NONE
E-MINY RBOB GASOLINE	QU	\$2,475	\$2,250	NONE
LOW SULPHUR GASOIL	ULS	\$3,355	\$3,050	NONE
CRUDE OIL	CL	\$4,703	\$4,275	50% of initial
HEATING OIL	HO	\$4,950	\$4,500	50% of initial
BRENT CRUDE OIL	BRN	\$4,950	\$4,500	50% of initial
RBOB GASOLINE	RB	\$5,060	\$4,600	50% of initial
NATURAL GAS	NG	\$6,270	\$5,700	50% of initial
<u>AGRICULTURE (CBOT)</u>				
MINI CORN	YC	\$176	\$160	NONE
MINI WHEAT	YW	\$275	\$250	NONE
MILK (CME)	DA	\$413	\$375	NONE
MINI SOYBEANS	YK	\$451	\$410	NONE
SOYBEAN OIL	BO	\$550	\$500	NONE
BUTTER (CME)	CB	\$770	\$700	NONE
OATS	O	\$798	\$725	NONE
CORN	C	\$880	\$800	NONE
WHEAT	W	\$1,375	\$1,250	NONE
ROUGH RICE	RR	\$1,375	\$1,250	NONE
HARD RD WINTER WHEAT	KW	\$1,430	\$1,300	NONE

SOYBEAN MEAL	SM	\$1,595	\$1,450	NONE
SOYBEANS	S	\$2,255	\$2,050	NONE
<u>MEATS (CME)</u>				
LEAN HOGS	LH	\$1,485	\$1,350	NONE
LIVE CATTLE	LC	\$1,650	\$1,500	NONE
FEEDER CATTLE	FC	\$3,080	\$2,800	NONE
<u>SOFTS (ICE)</u>				
FROZEN OJ	OJ	\$888	\$807	NONE
SUGAR #11	SB	\$1,047	\$952	NONE
COCOA	CC	\$2,090	\$1,900	NONE
COTTON	CT	\$2,915	\$2,650	NONE
COFFEE	KC	\$2,970	\$2,700	NONE
<u>OTHER</u>				
LUMBER (CME)	LB	\$3,025	\$2,750	NONE

An obvious step to take when trading a very small account in futures would be to look at some of the smaller contracts and cobble together a collection of these contracts, minimizing your margin requirements. You will still be over-leveraged, but you can get some experience trading and ramp up the learning curve.

Another idea for smaller accounts is to shorten the time frames if your situation will allow you the extra time. When looking at various time frames, I have found over time that longer term approaches to trading typically carry more trades that will have higher risk levels per unit. Conversely, the shorter the time frame, the more likely the risk on the trade may be minimal, allowing you to maintain your sizing discipline and still being able to trade at least one contract or a reasonable number of shares. As your account grows, you then can back off the time period and trade on a longer time frame.

## CHAPTER 9 – NOW THAT YOU ARE IN THE POSITION, WHAT NOW?

We covered all the necessary concepts of how to size a new position in your portfolio using easy-to-use concepts. If you follow these approaches and keep the percent allocations small enough, you should stay out of harm's way in your trading. However, as I learned painfully in the silver story that I shared with you in an earlier chapter, after you enter the trade, risk, volatility, and margins can change quickly.

In that fateful trade I made so many years ago, I learned to size the initial position to accommodate my account size. However, there was an additional lesson in that trade. After decompressing from what was thankfully the most profitable and yet stressful trade of my life up to then, I learned that managing the position size during the trade is important as well. In other words, your sizing work does not stop once you have entered the trade. You should remain on the job, and keep your portfolio in balance through the duration of the trade.

### ONGOING POSITION RISK ALLOCATION LIMIT

Sizing your position during the trade is NOT precisely equal to the sizing process we used to obtain our initial position sizes. When you initiate a new trade, you should have a stop loss point where you will abort the trade and preserve your trading capital. That risk level will change as the market moves in your direction or against you. If against you, the risk left now is declining as you are getting closer to your stop loss order. However, should the market move in your favor, and especially if it moves quickly, your risk will increase as the profits roll into your equity. That is a good thing, and we want to have as much of that as we can get.

At some point as the risk goes from say 1% to 1.5% to 2.5% to 4% to 6%, the

ability of your portfolio and your psyche to take the hit of the market moving straight back to your stop loss order starts to come into play. Depending on your Buy/Sell Engine, you may not be able to move up your stop order as fast as the market is moving in your direction, so risk is expanding fast.

Therefore, we need to set our ongoing position risk allocation percent at a higher level than our initial risk allocation percent but limit it to a sensible level of the portfolio's risk level.

For example, we might start at a 1% of equity risk allocation percent to calculate our initial position size, then let risk on the position grow to 2.5% risk at which point we peel off enough shares or contracts to stay under 2.5%; our top-side limit. This prevents each position from ever getting to the point where it dominates the portfolio the way that infamous silver trade did to me so long ago.

## INTRODUCTION TO FUTURES SIMULATIONS USING ONGOING RISK SIZING

I could not use the Trading Blox software to simulate ongoing risk limits to a position in stocks. I customized Trading Blox for my futures trading and can show you the results of ongoing risk control in a futures example. This would work the same way in stocks as it does in futures.

## VARIOUS SIMULATIONS USING ONGOING RISK LIMITS – FUTURES

All cases started with \$500,000 starting equity, 0.5% initial risk and volatility allocations

Risk %	Vol %	Ending Equity \$	CAGR%	Maximum Equity Drawdown%	Longest Drawdown (Months)	MAR Ratio	Modified Sharpe Ratio
1 Contract	\$500.0	\$686.6	+2.78%	-14.6%	83.8	0.19	0.47
Best Risk	0.5%	\$828.3	+4.41%	-13.8%	20.5	0.32	0.62
Best Vol	0.5%	\$1154.6	+7.42%	-23.9%	77.4	0.31	0.57
Risk 0.5%	Vol 0.5%	\$832.5	+4.46%	-13.1%	20.5	0.34	0.63
Ongoing	Risk 1.3%	\$859.5	+4.80%	-11.7%	20.5	0.41	0.68
Ongoing	Risk 1.4%	\$890.4	+5.12%	-12.8%	20.5	0.40	0.70
Ongoing	Risk 1.5%	\$894.1	+5.16%	-13.4%	20.5	0.38	0.69
Ongoing	Risk 1.6%	\$894.1	+5.16%	-13.0%	20.5	0.40	0.69
Ongoing	Risk 1.7%	\$884.6	+5.06%	-11.9%	20.5	0.43	0.68
Ongoing	Risk 1.8%	\$889.8	+5.12%	-12.6%	20.5	0.41	0.68
Ongoing	Risk 1.9%	\$904.6	+5.27%	-12.8%	20.5	0.41	0.69
Ongoing	Risk 2.0%	\$898.6	+5.20%	-12.6%	20.5	0.41	0.69
Ongoing	Risk 2.1%	\$907.0	+5.29%	-13.2%	20.5	0.40	0.68
<b>*Ongoing</b>	<b>Risk 2.2%</b>	<b>\$917.8</b>	<b>+5.40%</b>	<b>-12.9%</b>	<b>20.5</b>	<b>0.42</b>	<b>0.69</b>
Ongoing	Risk 2.3%	\$907.5	+5.29%	-13.1%	20.5	0.40	0.68
Ongoing	Risk 2.4%	\$892.9	+5.15%	-12.2%	20.5	0.42	0.67
Ongoing	Risk 2.5%	\$883.4	+5.05%	-12.7%	20.5	0.40	0.65

## ANALYSIS OF VARIOUS SIMULATIONS ON ONGOING RISK LIMITS - FUTURES

The base case is precisely the same as all the rest of the simulations. Next I added the cases I suggested as my favorites from the initial risk, volatility and risk/volatility combined cases. I then ran simulations for ongoing risk allocations percentages of from 1.0% to 3.0%. The cases are shown above. For ongoing risk, I like the 2.2% case and starred it. We have picked up more return than the 0.5 initial risk/volatility case, less drawdown, the same maximum time spent in a drawdown, and improved return to risk measures. Why not do this? Looks like we are continuing to make progress in this position sizing expedition.

## ONGOING POSITION VOLATILITY ALLOCATION

A similar situation exists with volatility, but I find that it tends not to need such a different level of allocation as does risk when market moves in your direction. When talking about ongoing position volatility, I'm reminded of that famous cartoon that has been floating around the web for years now that depicts the typical stock market cycle from bearish to a bull move, to speculation, to nervousness about the uptrend, to fear of the uptrend ending, to a full-fledged bear market and the angst that goes along with that, then back to the start of another cycle.



our tolerance for movement. As the market gets more exciting, we may not wish to have that market's position be very much more impactful on the portfolio, so we might set a limit on ongoing position sizing for volatility at 0.6% or 0.8% giving the position a little room to get exciting but keeping the position reasonably sized.

## INTRODUCTION TO FUTURES SIMULATIONS USING ONGOING VOLATILITY SIZING

We could not use the Trading Blox software to create a stock example for you, but rest assured that our work at Trendstat proved to us that controlling ongoing volatility in a position improves return to risk, reduces drawdowns, and smooths performance. Below is a table of various simulations varying the ongoing volatility levels. Base cases and selected initial risk and volatility cases are shown for reference.

## VARIOUS SIMULATIONS USING ONGOING RISK LIMITS – FUTURES

All cases started with \$500,000 starting equity, 0.5% initial risk and volatility allocations

Risk %	Vol %	Ending Equity \$	CAGR%	Maximum Equity Drawdown%	Longest Drawdown (Months)	MAR Ratio	Modified Sharpe Ratio
1 Contract	\$500.0	\$686.6	+2.78%	-14.6%	83.8	0.19	0.47
Best Risk	0.5%	\$828.3	+4.41%	-13.8%	20.5	0.32	0.62
Best Vol	0.5%	\$1154.6	+7.42%	-23.9%	77.4	0.31	0.57
Risk 0.5%	Vol 0.5%	\$832.5	+4.46%	-13.1%	20.5	0.34	0.63
Ongoing	Vol 0.5%	\$841.4	+4.61%	-11.8%	20.5	0.39	0.64
Ongoing	Vol 0.6%	\$859.3	+4.80%	-12.2%	20.5	0.39	0.63
Ongoing	Vol 0.7%	\$861.3	+4.82%	-11.8%	20.5	0.41	0.64
<b>*Ongoing</b>	<b>Vol 0.8%</b>	<b>\$862.1</b>	<b>+4.83%</b>	<b>-11.8%</b>	<b>20.5</b>	<b>0.41</b>	<b>0.63</b>
Ongoing	Vol 0.9%	\$862.1	+4.83%	-11.8%	20.5	0.41	0.63
Ongoing	Vol 1.0%	\$862.1	+4.83%	-11.8%	20.5	0.41	0.63

## ANALYSIS OF SIMULATIONS ON ONGOING VOLATILITY LIMITS - FUTURES

The base case is precisely the same as the initial risk allocation analysis. We've already set our initial risk and volatility allocations to 0.5%. The rest of the cases varied ongoing volatility allocation percentages from 0.5 to 1.0% of the equity for the 19 markets traded. When volatility reaches the allocation limit on percentage, enough contracts were exited to bring the volatility percentage of equity down to or below the limit. I starred the 0.8% allocation simulation as what I would probably choose to use for my strategy. It more than beats the base case on returns, reduces the maximum drawdown, equals the longest drawdown duration, and improves the return to risk measures. At higher volatility limit levels there is little to be excited about. It appears that volatility limits above 0.8% are of little value as all the statistics start becoming identical. Therefore, higher volatility limits do nothing to help us in this example. Looks like we've improved our position management strategy another notch.

## ONGOING POSITION MARGIN ALLOCATION

Margin in the ongoing position is less of a concern if we are already looking at ongoing risk and volatility in the positions. By the time the exchanges decide to increase the margins due to the market's new higher volatility and risk, you've already been peeling off some of your positions to size them correctly. I can't remember a time in my career when ongoing position margin ever came into play in my trading. If I had enough to initiate the position and if I have managed the ongoing position size well, I have always had enough ongoing margin.

## CHAPTER 10 - COMBINING ONGOING RISK AND VOLATILITY LIMITS – FUTURES

### INTRODUCTION TO SIMULATIONS USING ONGOING RISK/VOLATILITY SIZING

We could not use the Trading Blox software for ongoing risk and volatility in stocks but know from our Trendstat days that limiting both helps the cause. My modified version of Trading Blox does handle that question in futures, and I included some examples there to show the effects. I varied both ongoing risk and volatility and showed the results in the table on the next page.

## SIMULATIONS USING ONGOING RISK/VOLATILITY LIMITS – FUTURES

All cases started with \$500,000 starting equity

Risk %	Vol %	Ending Equity \$	CAGR%	Maximum Equity Drawdown%	Longest Drawdown (Months)	MAR Ratio	Modified Sharpe Ratio
1 Contract	\$500.0	\$686.6	+2.78%	-14.6%	83.8	0.19	0.47
Best Risk	0.5%	\$828.3	+4.41%	-13.8%	20.5	0.32	0.62
Best Vol	0.5%	\$1154.6	+7.42%	-23.9%	77.4	0.31	0.57
Risk 0.5%	Vol 0.5%	\$832.5	+4.46%	-13.1%	20.5	0.34	0.63
Ongoing	Vol 0.8%	\$862.1	+4.83%	-11.8%	20.5	0.41	0.63
Ongoing	Risk 2.2%	\$917.8	+5.40%	-12.9%	20.5	0.42	0.69
Ongoing Risk 2.1%	Ongoing Vol 0.7%	\$907.0	+5.29%	-13.2%	20.5	0.40	0.68
Ongoing Risk 2.1%	Ongoing Vol 0.8%	\$907.0	+5.29%	-13.2%	20.5	0.40	0.68
Ongoing Risk 2.1%	Ongoing Vol 0.9%	\$907.0	+5.29%	-13.2%	20.5	0.40	0.68
Ongoing Risk 2.2%	Ongoing Vol 0.7%	\$917.7	+5.40%	-13.1%	20.5	0.41	0.68
<b>*Ongoing Risk 2.2%</b>	<b>Ongoing Vol 0.8%</b>	<b>\$917.8</b>	<b>+5.40%</b>	<b>-12.9%</b>	<b>20.5</b>	<b>0.42</b>	<b>0.69</b>
Ongoing Risk 2.2%	Ongoing Vol 0.9%	\$917.8	+5.40%	-12.9%	20.5	0.42	0.69
Ongoing Risk 2.3%	Ongoing Vol 0.7%	\$907.1	+5.29%	-13.1%	20.5	0.40	0.68
Ongoing Risk 2.3%	Ongoing Vol 0.8%	\$907.1	+5.29%	-13.1%	20.5	0.40	0.68
Ongoing Risk 2.3%	Ongoing Vol 0.9%	\$907.1	+5.29%	-13.1%	20.5	0.40	0.68

## ANALYSIS OF SIMULATIONS OF ONGOING RISK/VOLATILITY LIMITS - FUTURES

The base case is precisely the same as all the other tables. For the rest of the cases, I varied ongoing volatility allocation percentages from 0.5 to 1.5% of the equity for the 19 markets traded. At the same time I varied ongoing risk allocation percentages from 1.0% to 3.0%. Due to the number of cases in performing those simulations, I showed the percentages below and above the sweet spot selections we made in the last two sections on ongoing risk and ongoing volatility management to keep the table easy to read.

It is not too surprising to me is that the 2.2% ongoing risk allocation percentage and the 0.8% volatility allocation percentage combination seemed like the logical place to run the portfolio. I starred that to highlight it. We've kept the returns, drawdown and drawdown duration the same while improving one of the returns to risk measures a tiny bit. This is not a huge step forward but improvement, nonetheless. Let's see if we can squeeze out some more improvement in one final step.

## CHAPTER 11 - MANAGING TOTAL PORTFOLIO RISK

Just as when we limit individual positions to some reasonable level, limiting the total portfolio risk to some reasonable level adds value as well. In the table above, I varied the various total portfolio risk levels from 10.0% to 15%. Remember that we are trading 19 markets in this portfolio, so this works out to a little less than 0.7% risk allocation per positions on average, some greater, some less.

Why would we do this? In the early days of my money management career, I noticed that when we were hitting all-time highs on the track record, clients wanted to add more money. Many times this was right before the next drawdown, and they had to hold on in order to see the next new equity high. That meant more talking to the client, keeping him/her comfortable staying the course, and extra work for me. Meanwhile, while many were adding to the fund at equity highs, I was seeing higher total portfolio risk levels and rebalancing my assets to other investments that were not making new highs.

The opposite was also true at the bottom levels of a drawdown. Clients hate drawdowns and frequently use a drawdown as an excuse to pull the assets out of the fund. I found that measuring total portfolio risk was useful in picking spots to add more money to my fund. The total risk of all 19 markets would be at relatively low levels historically, and I figured it was a lower risk time to invest. Many times I came relatively close to the levels at which the fund's performance turned and eventually made new highs. This all means that when clients were getting scared out of the fund, I was comfortable adding more assets to my position. I even told my clients this to attempt to keep them in the fund but frequently failed in my efforts.

SIMULATIONS USING ONGOING PORTFOLIO RISK LIMITS –  
FUTURES

All cases started with \$500,000 starting equity

Risk %	Vol %	Ending Equity \$	CAGR%	Maximum Equity Drawdown%	Longest Drawdown (Months)	MAR Ratio	Modified Sharpe Ratio
1 Contract	\$500.0	\$686.6	+2.78%	-14.6%	83.8	0.19	0.47
Best Risk	0.5%	\$828.3	+4.41%	-13.8%	20.5	0.32	0.62
Best Vol	0.5%	\$1154.6	+7.42%	-23.9%	77.4	0.31	0.57
<b>*Risk 0.5%</b>	<b>Vol 0.5%</b>	<b>\$832.5</b>	<b>+4.46%</b>	<b>-13.1%</b>	<b>20.5</b>	<b>0.34</b>	<b>0.63</b>
Ongoing	Vol 0.8%	\$862.1	+4.83%	-11.8%	20.5	0.41	0.63
Ongoing	Risk 2.2%	\$917.8	+5.40%	-12.9%	20.5	0.42	0.69
<b>*Ongoing Risk 2.2%</b>	<b>Ongoing Vol 0.8%</b>	<b>\$917.8</b>	<b>+5.40%</b>	<b>-12.9%</b>	<b>20.5</b>	<b>0.42</b>	<b>0.69</b>
Ongoing Portfolio	Risk 10.0%	\$868.0	+4.89%	-12.3%	20.5	0.40	0.73
Ongoing Portfolio	Risk 10.5%	\$900.7	+5.23%	-12.0%	20.5	0.44	0.76
Ongoing Portfolio	Risk 11.5%	\$878.7	+5.00%	-12.3%	20.5	0.41	0.70
Ongoing Portfolio	Risk 12.0%	\$894.3	+5.16%	-12.7%	20.5	0.41	0.71
<b>*Ongoing Portfolio Risk 12.5%</b>	<b>Risk 12.5%</b>	<b>\$933.5</b>	<b>+5.55%</b>	<b>-12.7%</b>	<b>20.5</b>	<b>0.44</b>	<b>0.74</b>
Ongoing Portfolio	Risk 13.0%	\$895.5	+5.17%	-12.9%	20.5	0.40	0.69
Ongoing Portfolio	Risk 13.5%	\$883.8	+5.05%	-12.5%	20.5	0.40	0.67
Ongoing Portfolio	Risk 14.0%	\$916.9	+5.39%	-13.1%	20.5	0.41	0.69
Ongoing Portfolio	Risk 14.5%	\$928.0	+5.50%	-12.9%	20.5	0.43	0.70
Ongoing Portfolio	Risk 15.0%	\$922.6	+5.44%	-12.9%	20.5	0.42	0.69

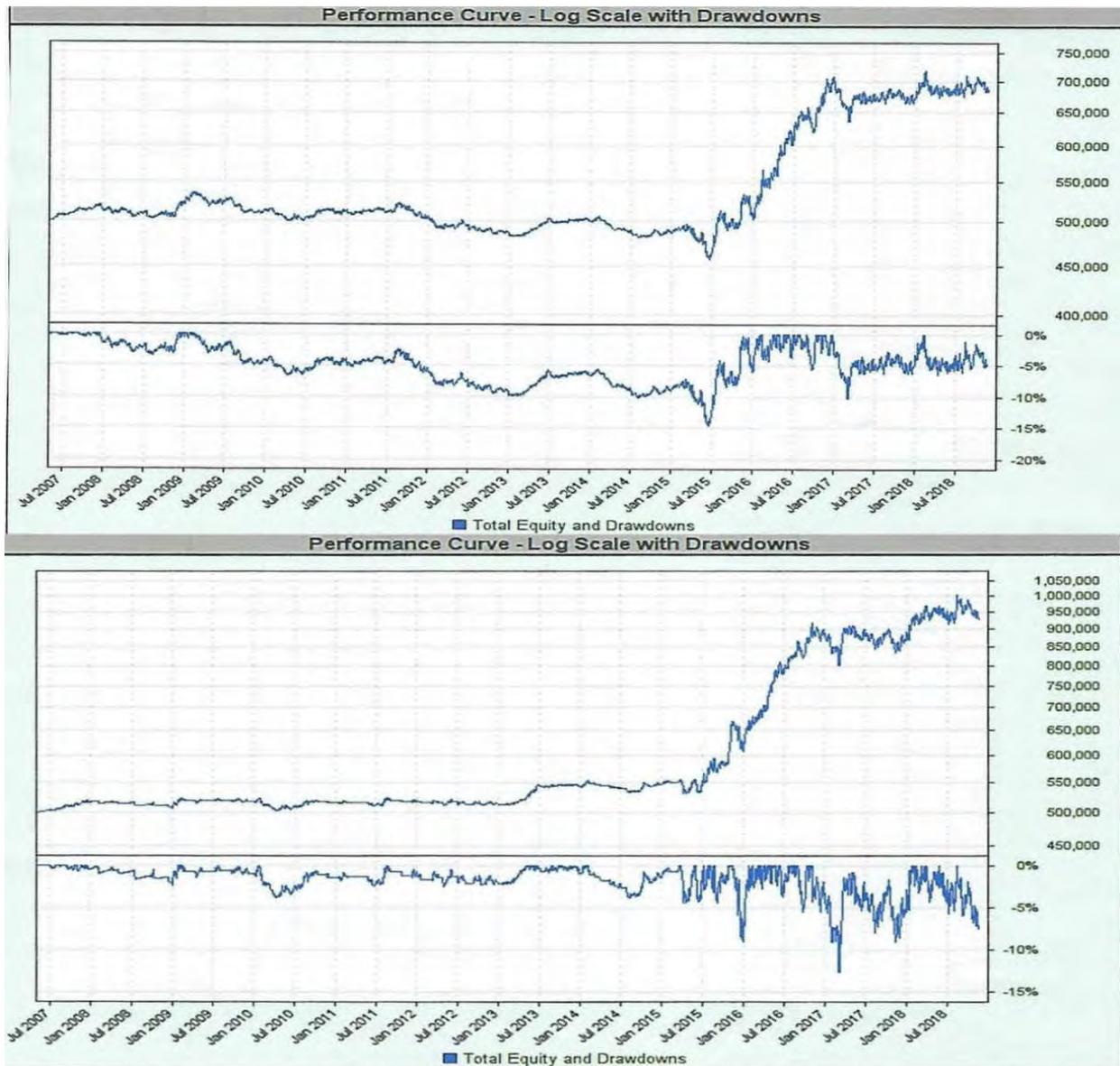
All the cases are decent and way ahead of the base case and the other cases we selected throughout this process of improving our risk management. My favorite was the 12.5 total risk percent limitation on the portfolio. It has the highest return, very high return to risk ratios, an improved drawdown over the other optimum cases, and the same maximum spent in a drawdown. We now have more progress on our position sizing adventure!

How do you use this feature in your portfolio? When total portfolio risk exceeds your limit, you simply peel off part of enough of your positions to bring the total back down to at or below your limit restrictions. If I need to take off 5% of the portfolio's position, I start with that position that would be easiest to peel off which is the one with the largest number of shares or contracts. I take off 5% of it and see where I am on the calculation. I then move to the next easiest, take that size down and repeat until I arrive at acceptable total portfolio risk levels. I do this at market on open the next day, but you can execute these portfolio limit trades whenever suits you best.

## CHAPTER 12 – HOW FAR WE’VE COME

We started this position sizing exercise with a boring trend following model for our Buy/Sell Engine. Trading one contract of the 19 markets in the portfolio yielded a drawdown that few would have stuck around for. The return was very low due to two periods in the last 11 years that did not favor these markets, or this strategy and only one period that was highly successful.

Below are two performance graphs.



The top one is our starting base case with a very long drawn out drawdown, a growth spurt, then more sideways. The second is where we ended up with 0.5% initial risk and volatility sizing, 2.2% ongoing risk allocation percent, 0.8% ongoing volatility sizing percent, and 12.5% total portfolio risk limits.

Which would you prefer to trade if these were your only two alternatives? It is easy to pick the second one. In the second new and improved track record, the early drawdown is not so long. You might be able to stick it out with some discipline. The surge up is just as successful but smoother. The largest

drawdown is after a very nice move up, so you might have a bit more patience with it. Finally, the last part of the graph is still moving up a little versus the base case heading sideways.

We added over +2.77% of value, improved the two return to risk measures we were using, drastically dropped the maximum time spent in a drawdown, and dropped the maximum drawdown by almost 2%. Of course you would want to choose the second track record over the first one.

So why don't some traders bother with position sizing? Some might think they have insight into their next trade, so they can load up. Others are scared after three losses in a row and decide to lighten up until they figure out what they are doing wrong. Some don't have computer skills and figure it is just too much effort to do the calculations, and they come up with a simplistic approach to sizing that may add no value or even hurt performance long-term. Others are so under-capitalized that the position sizing algorithms are telling them to buy or sell zero shares or contracts. The algorithms may be whispering to these traders that it would be highly useful to get more capital into their trading accounts somehow.

Bottom line is proper sizing of your positions, both initially and throughout the trade, and limiting total portfolio risk is running your trading like a business, rather than some fly by the seat of your pants casino game. **Sizing strategies will increase returns, decrease risk and volatility, and improve return to risk.** All of this helps the trader stay with it during hard times which may be just around the corner.

## CHAPTER 13 - “SCALING OUT” VERSUS “RIGHT-SIZING”

Tharp, in his great book, Definitive Guide to Position Sizing Strategies, decided that my approach to ongoing position sizing constituted what he thought of as scaling out of the position. To the outside observer, it certainly looks like I’m scaling out of the position. I put on a large position with many shares or contracts. Risk and/or volatility increases. I lighten up on part of the position to bring risk and volatility back into acceptable norms, usually taking a small profit doing so. It may seem like nitpicking, but I do not see it that as “scaling out.”

If your Buy/Sell Engine has a decision process that gives you spots to scale out of your initial position, say with break-evens or some sort of profit target, fine, then you are scaling out of the initial position. However, if you have the simplest of trend following strategies, you are either up or down, 100% in or out. If you enter a trade that eventually has the risk and volatility expanding and peel off part of the position to keep your position well-managed, I would call it right-sizing the position. You are not scaling out due to your Buy/Sell Engine at all. You are sizing based on keeping risk and volatility in check. This is perhaps a very small point, but philosophically I wanted to make sure new traders have the distinction clear between the two terms.

## CHAPTER 14 – WHERE TO DIAL IN YOUR EXPOSURES

Now we have some elegantly simple ways to keep our positions right-sized all the time from the start to the end of each trade we make. We can also limit the total portfolio risk to reasonable levels. The next decision to make is where to set the risk, volatility, and margin allocation percentages. This is part of the process **EACH TRADER HAS TO MAKE FOR HIMSELF/HERSELF**. Each of us in the trading game has different levels of tolerance to risk and volatility and different Buy/Sell Engines, capital and time periods, and therefore we all need to dial in the exposure to our own needs. There is no one number that will work for every strategy and every trader.

All the simulations I ran for this book showed between 35-38% win percent rates. In other words, out of every 100 trades, on average 35-38 trades were positive, while the rest lost money. This win percentage is actually a little higher than what I would have expected from this Buy/Sell Engine used in the simulations. Historically, most trend following models I have checked have yielded closer to 33-35% reliability. Keep that in mind when going into a trade without good position sizing. You have roughly a 67% chance of losing on the trade. Seems to me that if I had a 2 to 1 chance of losing on the upcoming trade, I would definitely want to manage the size of that loss to optimal levels.

### SHOOTING FOR THE MOON IS NOT AN OPTION

You may have heard of approaches to sizing your position according to maximizing your returns. Ralph Vince's very popular early books proposed running simulations and increasing the "portfolio heat," or exposure of all your positions in the portfolio, to the point where you get the highest return while keeping the portfolio alive and kicking. In other words, take the leverage, risk and volatility up to the point of the portfolio blowing up, then

back off of that level a notch.

From Wikipedia, the Kelly Criterion or Kelly Bet for simple bets with two outcomes, one involving losing the entire amount bet, and the other involving winning the bet amount multiplied by the payoff odds, the Kelly bet is:

$$f^* = (bp - q) / b = (bp - (1-p)) / b = (p*(b+1) - 1) / b$$

where:

$f^*$  is the fraction of the current bankroll to wager, i.e. how much to bet;

$b$  is the net odds received on the wager (" $b$  to 1"); that is, you could win \$ $b$  (on top of getting back your \$1 wagered) for a \$1 bet

$p$  is the probability of winning;

$q$  is the probability of losing, which is  $1 - p$ .

Both of these approaches to sizing are like pushing the accelerator to the floor in trading terms. Things will happen fast and violently testing your resolve and discipline. Eventually, every trading strategy I have run over my lifetime has had a rough patch along the way. Trading near the highest level you can theoretically trade and not bankrupting the portfolio will definitely test every psychological weakness you have. Most, including myself, would find it hard to remain calm and strategic in that situation. I would suggest this is definitely not a great approach even for the experienced trader.

## HERE'S A PLACE WHERE LESS IS MORE

If we decided to do the opposite of extremely leveraged trading and start our allocation strategy with very low exposures with risk percents below 0.25% and volatility allocations at 0.25% or lower, we would quickly realize a few things:

1. Our returns would be minimal.

2. Our portfolio would likely be boring to follow.
3. Drawdowns would be minimal.
4. The capital that would be required to initiate even one unit of a position would be very large or
5. At the smaller capital most trader start with the calculations would yield zero units, keeping us out of most markets.

Therefore, we have to find the happy medium. In the examples shown in earlier chapters I've shown levels of exposure that I would find acceptable to my strategies and my tolerance levels. Most of you should start lower than those if you can and raise your levels of risk and volatility allocation percentages as you gain experience and become more comfortable with your strategy and the process of trading your portfolio. That will be the correct place to begin.

## CHAPTER 15 – MR. SERENITY’S THOUGHTS ON THE SIZING “SWEET SPOT”

When Jack Schwager decided to tag me with the nickname “Mr. Serenity,” it was based on his perception that I was one of the more even-keeled traders he had ever run into. Not much bothers me. I don’t watch the markets second to second. I spend maybe 30 minutes or less after the market close updating my indicators and position sizes and move on to other more fun activities that a retired guy like me enjoys. I work out frequently, play some golf, love cooking, singing and dancing. I’m good with landscaping, I like speaking to other traders, and I have written quite a few research papers and books for the investing industry.

It should therefore be no surprise that the reason I can be so “serene” about trading is that my position sizes are right-sized. I have decades of experience in trading. My capital is enough to trade efficiently. My schedule allows me to spend 30 minutes a day on trading. I have even done my daily investment process on a cruise ship in the middle of the South China Sea! That challenged the band-width available on the ship, but I got it done.

Rolling this all together into a strategy that fits me and my situation, right-sizing my positions and developing the mental discipline to run the strategy each day helps to keep me serene. Why would I stress over anything? I have a well-thought-out strategy. The sizes of my positions help keep returns and losses reasonable. This allows my mental process to stay even keeled. I do not have the big profits or losses that could catch my emotional attention. I do not have such a low position sizes that would bring boredom and the lack of attention to the daily routine.

I used specific numbers in the examples to allow you to see a simple example. Your sweet spot will be different from mine. No worries! When you find the proper level to trade for you, everything will seem easier and

less stressful. If you are just starting out, start with as small a size as you can. As you are successful with trading and are starting to notice a long run of sticking to your strategy, having discipline, and feeling comfortable with the process, you can always dial it up a little at that point. The more experience you have, the more size you can tolerate and still feel comfortable that you are right-sized. Err on the conservative side. Keep it simple. Trading does not need to be complicated.

So size your positions to appropriate levels, and enjoy the ride!

Tom Basso

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THE END