**Van Tharp's**

**Definitive Guide to**

**Position** SizingSM.

How to Evaluate Your System and Use

Position SizingsM to Meet Your Objectives

by

Van K. Tharp, Ph.D.

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*International Institute of Trading Mastery. Inc.*

*102A Commonwealth Ct., Cary, NC 27511*

*(919) 466-004-3----*

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*This book* is *dedicated*

*to Melita Hunt, the CEO 0/ the International Institute*

*o/Trading Mastery. This book would not be possible without Melita's*

*inspiration. Melita, you will always be in my heart.*

**Contents**

Preface

Acknowledgments

PART I

**THE GOLDEN RULES OF TRADING AND HOW TO EVALUATE THE**

**QUALITY OF YOUR TRADING SYSTEM**

**Introduction to System Evaluation**

**Chapter 1**

**The Golden Rules of Trading**

**Chapter 2**

**Risk (R) and R-Multiples**

Understanding R-Multiples

Using Your Total Risk to Keep Track of Your R-Multiples

What If You Don't Know Your Initial Risk?

More Thoughts about Expectancy

What about the Variability?

So What's the Downside?

Chapter 3

**Evaluating the Quality of Your Trading System**

Rating Your System

One Problem with System Quality NumbersM and How to Overcome It

Statistical Assumptions in Using This Material

33

Improving Your System Quality NumbersM (SQNSM)

What's Important in Getting High SQNsSM?

Chapter 4

What Can I Expect in the Future?

Question I: Is My Sample Representative?

Question 2: Is My System Valid?

Question 3: What Can I Expect from My System in the Future?

Question 4: What Kinds of Markets Will My System Work In?

Question 5: What IfI Have Multiple Correlated Trades?

Summary: What Do I Know about My System at This Point?

How Will I Trade Differently with This Information?

Chapter 5

Are You Doomed to Failure?

Judgmental Shortcuts

Bias I: Locus of Control-The Lotto Bias

Bias 2: The Need to Be Right

Bias 3: Percent Gain

Bias 4: Lots ofInput Says the Same Thing

Bias 5: Authority

Bias 6: Prediction and Understanding

Bias 7: Wanting Lots of Facts

Other Biases That Influence Being Right

Bias 8: The Law of Small Numbers

Bias 9: Once We Think We've Got It, It's Hard to Get Rid ofIt

Bias 10: Representation

Conclusion

PART II

UNDERSTANDING THE BASICS OF POSITION SIZINGsM

Introduction to Position SizingSM Basics

Chapter 6

The Most Important Factor (Besides You) in Your Trading

Understanding Low-Risk Ideas

Psychological Biases Against Proper Position Sizing

The Need to Be Right Bias in Position Sizing

The Gambler's Fallacy

Streaks Cause Us to Doubt Probabilities and Change Our Risk

Not Enough Money or Too Much Greed

Chapter 7

CPR for Traders and Investors

The Importance of Position Sizing

The Three Components of Position Sizing

The CPR Model for Position Sizing

More Basics: Equity Models

Chapter 8

Core Position SizingSM Models

The System Used

Model I: Units per Fixed Amount of Money

Model 2: Equal UnitslEqualLeverage Model

Model 3: Percent Margin

Model 4: Percent Volatility

lOS

ModelS: Percent Risk

More Examples

Chapter 9

More Position SizingSM Models

Model 6: Group Control

Model 7: Portfolio Heat

Model 8: Long versus Short Positions

Model 9: Equity Crossover Position Sizing

Position Sizing Under Unusual Circumstances

Model 10: Asset Allocation to Determine Position Sizing

Model 11: Position Sizing for Portfolio Managers

Model 12: Position Sizing for Professional Traders

Who Don't Know How Much Equity They Have

ChapterlO

Comparing the Impact of Various Models

The Models Compared

PART III

USING POSITION SIZINGsM TO MEET YOUR OBJECTIVES

Introduction to Using Position SizingSM to Meeting Your Objectives

Chapter **11**

Meeting Your Objectives

Objectives Re-examined

A Look at Optimal Bet Size

Expectancy, Win Rate, and Position Sizing

Conclusion

Chapter 12

Position SizingSM Methods to Meet Your Target Profit Objective

Model 13: Using Your Optimal Target Risk Percentage

Model 14: Market's Money Methods

Model 15: Scaling In Techniques

Chapter 13

Using Fixed Ratio Position Sizing (FRPS) to Meet Your Profit Target

Fixed Ratio Position Sizing Explored

Assumptions Necessary to Simulate FRPS

Position Sizing Evaluation

The Models Compared

How to Improve Your Performance with FRPS

Evaluation of Results

Conclusion

Model 16: Using Fixed Ratio Position Sizing

Checklist to Trade FRPS

Advantages and Disadvantages of FRPS

Chapter 14

Position SizingSM Methods to Help You Avoid Ruin

Using Position Sizing to Limit Your Downside Potential

Model 17: U sing Your System Quality NumbersM

to Determine How to Limit Risk

Model 18: Two-tier Position Sizing

Model 19: Multiple Tier Approach

Model 20: Using the Maximum R-Drawdown

Model 21: Scaling Out to Smooth Equity Curves

Model 22: Basso-Schwager Asset Allocation Technique Applied to Systems

Conclusion

PART IV

**MISCELLANEOUS POSITION SIZINGsM INFORMATION**

**Introduction to Miscellaneous Position Sooni'M Information**

**Chapter IS**

**Position SizingSM Strategies to Avoid!**

Martingale Position Sizing Models

Model 23: When Probability Is Out of Line, Increase

Your Position Sizing

Model 24: One Up, Back One

Model 25: One Up, Back One, Version 2

Model 26: Regression toward the Mean Position Sizing

Other Dangerous Models to Avoid

Model 27: Intuitive Position Sizing

Model 28: Joe Ross Method

Model 29: Percent Risk Based Upon Winning Percentage

Model 30: Kelly Criterion

Model 31: Optimal!

Conclusion

**Chapter 16**

**Putting It All Together: An Interview with Chris Anderson**

**Chapter 17**

**Position SizingSM Software Examined**

**235**

My Experiences with Position Sizing Software

Software to Keep Track of Your Trades

Simulation Software

Position Sizing Software

System Specific Software with Position Sizing Capabilities

Multi-Purpose Software that Includes Position Sizing

High-End Software

Conclusion

**Chapter 18**

**Some of Your Questions Answered**

Category 1: Miscellaneous Questions

Category 2: Expectancy versus Position Sizing

Category 3: I Don't Understand One of the Models

Category 4: Position Sizing and Risk of Ruin

Category 5: Account Size and Liquidity

Category 6: Multiple Accounts

Category 7: How Do I Position Size? What Do You Think of My Method?

Category 8: What Do You Think of This Form of Position Sizing?

Category 9: Math Questions

**Chapter 19**

**Self-Evaluation**

**Appendix I**

**Appendix II**

**Glossary**

**Index**

**Preface**

Perhaps the greatest secret to top trading and investing success is appropriate money

management or what we now call position sizing. I call it a "secret" because few people

seem to understand it, including people who've written books on the topic. Some people

call it risk control; others call it diversification. Money managers call it managing other

people's money and still others call it how to "wisely" invest or spend your money.

However, the money management that is the key to top trading and investing simply refers

to the algorithm that tells you "how much" with respect to any particular position in the

market. And because the topic of money management is so conflicting, I've elected to call

it position sizing throughout this book.

I've written this book to give you an overall understanding of the topic and show you

various models of position sizing. Enjoy the journey; it's potentially the most profitable

journey you will ever take as a trader. The material is quite complex, despite my attempt

to make it simple. However, you'll find it well worth your while to go through all the

examples until you have mastered it.

One of the fundamental concepts that you wiIllearn in this book is that position sizing is

the key to meeting your objectives as a trader. Most people assume that there is just one

objective to trading-their own-and thus their view is biased by their objective. As a

result, they never realize that the purpose of position sizing is to meet your objectives.

The purpose of position sizing is to meet your objectives.

There are many other key concepts that stem from this primary one.

There are probably an infinite number of objectives that you could have and thus,

an infinite number of ways for you to use position sizing.

• It is important for you to define your objectives before you develop a system and

before you develop your position sizing routine.

• Although your system has very little to do with meeting your objectives, we have

developed a method to ~uantify the auality of your system, which we call the

System Quality Number M or SQNs for short.

• We've discovered that the higher your System Quality NumbersM, the easier it

is to use position sizing to meet your objectives.

• You might even think of position sizing as a separate system, overlaid upon your

primary system, which is designed to meet your objectives.

**Chapter 4**

**What Can I Expect in the Future?**

The purpose of this chapter is to give you an idea of how to answer the question: "What can I

expect from my system in the future?" Some people backtest their system to determine if it gives

them a good enough return (i.e., expectancy). In my opinion, what most people do to answer this

question is totally inadequate, but it still helps to give them enough confidence to trade a system.

Typically, they use backtesting software to test possibility after possibility so that one might end

up with something that looks profitable, but isn't well thought-out. But this procedure only looks

at one possible sample of many possible samples. It usually doesn't represent their system, and

that's usually a prescription for disaster.

For example, suppose you want to test a moving average crossover system. It's profitable but not

something you'd want to trade. As a result, you start testing other different moving averages and

then add an oscillator and suddenly you come across something that seems to work quite well and

produces great profits. But what do you have? You aren't really sure you have anything at all

because you didn't think it over.

Let's say you have thought out your concept and backtested it with perhaps just a few adjustments

to make it work to your satisfaction. For some people, testing one sample in this way is enough to

give them the confidence needed to trade that system, especially if you've tested over 20 years of

data, with hundreds of samples from each of the different markets. But all you really know is one

example of how your system worked on past data. And even if the R-multiples generated by your

system in that testing accurately represent what your system can do, you are still missing a lot of

information. Your real job at this point is to ask some very standard questions:

1. Does my sample accurately represent the kind of results I can expect from my system?

2. Is this system valid? Does it really do what it is supposed to do?

3. If! answer "Yes" to both questions, what can I expect from this system in the future?

What will happen in terms of drawdowns? What can I expect to eam? How variable will

my performance be?

4. What kinds of markets will my system work in?

5. Does my testing assume that one trade is made at a time? If so, what will the implications

be on real trading if! have a portfolio of multiple, correlated trades?

6. And, with the objectives I have in mind and theresults of my testing, how should I position

size this system to adequately meet my objectives?

Question 1: Is My Sample Representative?

So you've now done some backtesting on your system. You have a sample of25 trades,

representing a year of trading. Now you must ask yourself the critical question: "Are these results

representative of what could really happen with my trading system, trading real money in the

markets?"

There are several rules that you can generally use to help you answer this question. First,

statisticians usually require a minimum sample size of thirty trades to even begin to estimate the

real population of trades. In other words, your system could generate an infinite number of trades

and you need at least thirty samples to even begin to estimate what that infinite population might

look like. If you have 100 (or better yet 500) samples, then you can feel even better about the

results you might be getting.

As a trader, however, you can do even better than a large sample size. You can use some common

sense logic by asking yourself more important questions:

1. What is the purpose of my system? For example, your system might be a trend following

system. Wouldn't it make sense that your system would only work well when the markets

are trending? But will it perform equally as well in down-trending markets as in up

trending markets? Will it perform equally as well when the market is volatile and trending

(very active with large daily ranges) as when the markets are quiet and trending? If you

understand your system, then you should be able to answer these questions at least

roughly.

Once you understand the purpose of the system, you can then focus on your sample

representativeness. Pollsters understand sampling very well. If they want to find out how voters

think about some particular issue, they will call several hundred people and ask them. But this

only works if they get a reliable sample. Their sample must represent the population of voters

adequately. Do they have an accurate representation of each age group, each sex, each ethnic

group, and any other variable that they believe to be important to this issue? If the sample does

represent the voting population, then they can conclude that they have a pretty good idea how the

country thinks about that particular issue.

Just as the pollsters must determine if their sample of voters is representative ofthe population,

you must also determine if your sample ofR-multiples is representative ofthe markets you'll be

trading. So here is the next question to ask yourself:

2. What kind of markets did I take my sample from? In order for you to adequately predict

how your system will do in the future, you need to sample at least 30 trades from each of

the six kinds of markets mentioned previously. That means you need a sample of at least

180 trades-30 from each market type-to adequately answer the question, "How will my

system perform in the future?" A sample of 500 trades really won't do you any good if it

is just from up-trending quiet and volatile markets. Why? Because it won't tell you how

your system will perform in other types of markets. Your sample will not represent its

performance in those markets.

If a pollster wants to know how Democrats will respond to a particular stand on some issue that

their candidate has taken, then they must poll only Democrats. Similarly, you can restrict your

trading to certain kinds of markets by putting some sort of filter on it.

3. Thus, you could ask yourself, "How can I filter for the kind of markets I want to trade?"

For example, in *Safe Strategies for Financial Freedom,* I presented a strategy for trading

bear market mutual funds in a down market. However, this requires either a I) down quiet

market or 2) a down-volatile market for it to work. So how do I filter for those markets?

First, I require that the 1-2-3 model be in the red-light mode (see *Safe Strategies for*

*Financial Freedom* for how that model works). And, second, 1 require that all three major

indices be down over the last five weeks. The model doesn't take a trade unless those

conditions are met. And third, 1 need a weekly drop in the S&P 500 of 2.5%, which is

volatile by today's conditions. The book was finished in late 2002 and we have not had

that kind of market between late 2002 and the publication of this book. The S&P 500

seldom moved more than 1.5% per week in 2003 through 2006 and throughout most of this

period the market also had a slight upward bias. And the chances are pretty good that you

won't see this sort of signal in an up market, although it might happen occasionally in a

sideways market.

**Question 2: Is My System Valid?**

Now that you have answered the first of our five questions and decided that your sample does

represent the real performance of your system in the markets you'll be trading, you must ask the

second question: "Does this system do what it is supposed to do---make money?" If it does, then

you probably have a decent system. There are several ways that you can answer this question.

First, you can do a Monte Carlo simulation of your system to determine if a sufficient number of

samples make money. Let's say you have a sample of 30 trades. You want to determine what

happens when you sample 100 such 30-trade samples. What percentage of these samples makes

money? Are you happy with those results?

Most people would probably be happy with the system if95% of the samples made money. Think

of the implications ofthis. It means that you'd only have about one losing month every other

year. That would delight most people. If95% of your samples made money, then you would

definitely have a statistically significant system. System 3-1, for example, when 30 trades are

taken over 10,000 simulations, makes money about 85% of the time. This means that if you made

30 trades per day with it, that 85% of your days would be profitable. If you made 30 .trades per

month, then 85% of your months would be profitable. And System 3-1 doesn't even have an

acceptable SQNSM.

What happens if only 85% of your samples make money? This would mean that you'd lose

money in two ofthe 12 months of trading. Would you be satisfied with that? Most people

probably would, since it's still way above average. How about if only 75% of your samples make

money, implying that you'd only make money in 9 out ofthe 12 months of the year? Or how

about 60%, implying that you'd only make money in 7 of the 12 months-would you be happy

with that? Anyway, at some point, you'd decide that your system wasn't good enough and wasn't

worth trading. I suspect that most of you would want at least 75% of your samples to make

money.

Another approach to this would be to look at your system's SQNsM by plugging in the exact

number of trades you will have in a year into your sample (i.e., N = ?). Now you basically have a

t-score and you can get a rough idea of whether or not your results are statistically different from

zero simply by using Appendix II. You'll be asking the question, "Can I statistically reject the

assumption that my system won't make money?" Ifthe chances of that assumption being true are

less than 0.05, then you can statistically reject that hypothesis and assume that your system will

make money. Again, many of you won't have a statistically significant system.

Once you are confident that your system will make money, you can go on to answer the third and

fourth questions.

Question 3: What Can I Expect from My System in the Future?

Question three now takes system performance testing way beyond the scope of backtesting. In

backtesting you only have one sample-a historical sample of some many months or years of data.

You might have 1,000 samples of data over 20 years, but it only represents what happened in the

past-not what will happen in the future.

However, you can get a better idea of what might happen in the future by taking your data sample

and plugging the R-multiple distribution into a Monte Carlo simulator. My friend, Chris

Anderson, has developed such a simulator and has allowed me to use it for my personal use. And

through it, I can determine several things!:

I.

What can I expect from my systems in terms of drawdowns? What is the maximum

drawdown in terms of R? What is the probability of getting a drawdown as big as 20R

in my sample of 100 trades? How long might that drawdown last?

2.

How will I know what to expect in terms oflosing streaks? What is the chance of

getting a losing streak of lOin a row or bigger with this system in 100 trades?2

3.

How will I know when this system is broken or no longer working?

4.

And most importantly, given the results of the simulation, how can I position size this

system to adequately meet my objectives in trading it?

The first three questions in this set are answered next, but we'll wait until Part III to answer

question four.

You can do such simulations by I) making up a bag of marbles that represent the R -multiples of

your system and simulating 100 trades, 2) using the simulator in the *Secrets of the Masters™*

game, or 3) using one of the simulators reviewed in Chapter 17.

Let's assume that I have a valid and reliable sample ofR-multiples from my system. I can put

those into a simulator that can do 1,000s of simulations, just to show you the process. For

example, we could run a simulation of 10,000 runs of 130 trades.

The simulator takes the R-multiple distribution we plug into it and assumes that it is the

population of trades possible for our system. This assumption is fine if you have answered the

first two questions in this chapter. For trade one, the simulator randomly selects an R-multiple

value from the sample it has and assumes it's the result of the first trade. For trade two, it does the

same thing and it could select the same value again because every time it selects randomly from

the possible population. For example, you could have a 20R trade that only occurs 1% of the time.

That particular trade might be sampled ten times in a row. This would be a very unlikely

occurrence (with a probability of I.OE-20), but it's possible. Remember that you can do this

yourself (although much more slowly) with a marble bag or with the *Secrets afthe Masters™*

game, recording the R-multiples as you get them. The net result will be a set of equity curves.

The personal level ofthe game will also give your worst-case drawdown each time you play. You

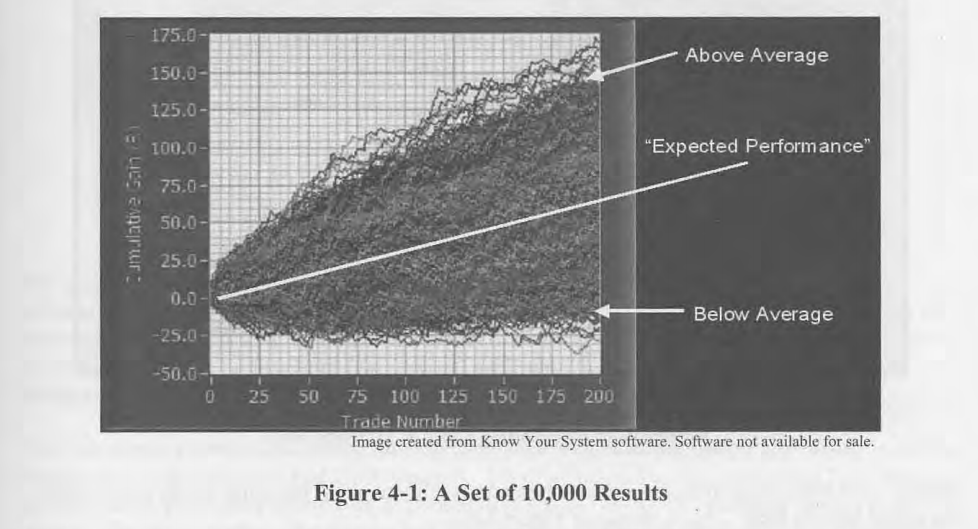
should save this data.

Figure 4-1 shows a hypothetical set of equity curves (in terms ofR) for 10,000 samples. The

middle one is what you can expect, on average, but there is a chance for curves at the extremes

and that's how you learn what to expect from your system. The lines show what might be

expected; what's above average and what's below average.



People want to know the possible drawdowns of their system. What's the peak drawdown against

you in terms of its cumulative R-multiple?

Suppose you had the following sequence of trades: +1 R, +2R, + lOR (here you make an equity

peak and then start a drawdown), -2R, + I R, -3R, + IR, -2R, -1 R, -IR, -5R, (the drawdown peak

occurs here and then you start to move out of it) +2R, +2R, + I R, + lOR, +5R, etc. If you add up

all of those R-multiples during the drawdown, you'd find they added up to a total drawdown of

-12R. You then get four trades, giving you + 15R, so by the time you hit the lOR, you are at a

new equity peak in terms ofR. lfyou started another streak oflosing trades before you hit a new

equity peak, then you might fmd that your peak-to-trough drawdown was even bigger than -12R.