Wiley Trading Series

# A GUIDE TO CREATING A SUCCESSFUL ALGORITHMIC TRADING STRATEGY

PERRY J. KAUFMAN

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# A Guide to Creating a Successful Algorithmic Trading Strategy

The Wiley Trading series features books by traders who have survived the market's ever changing temperament and have prospered—some by reinventing systems, others by getting back to basics. Whether a novice trader, professional or somewhere in-between, these books will provide the advice and strategies needed to prosper today and well into the future. For more on this series, visit our website at www.WileyTrading.com.

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To my mother, Helen, who has proofread every book that I've written. If you find any errors, please direct your comments to her.

Thank you all.

PJK

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A reminder from Barbara Rockefeller's Morning Forex Briefing:

> The researches of many commentators have already thrown much darkness on this subject, and it is probable that if they continue we shall soon know nothing at all.
>
> —*Mark Twain*

# Contents

CHAPTER 1

# A Brief Introduction: The Ground Rules

*Everything should be made as simple as possible, but not simpler.*

—Albert Einstein

If you haven't heard it, a classic example of trading experience is the difference between a statistician and a trader. You flip a coin 99 times and it comes up heads each time. You ask the statistician, "What are the odds that it will come up heads next time?" The statistician answers, "50:50." You ask the trader the same question and he answers, "100 percent." Surprised, you ask the trader, "Why?" He responds, "Because it couldn't possibly be a fair coin. The odds of getting 99 heads in a row are too high to have happened by chance." Experience transforms theory into reality.

When I first started trading using automated systems in the early 1970s, the very idea was demeaned by professional traders as "ridiculous," "the market just doesn't work that way," "you can't make money if you don't know the value of the stock." Now that opinion seems to have been turned upside down. High frequency trading, the algorithmic trading system on steroids, has "an unfair advantage," "it's stealing money from the ordinary investor." Times have changed, but attitudes have not.

## MY OBJECTIVE

This is a no-frills book. It's short because it just deals with the most important issues of developing a successful trading system and because you're more likely to read it all. It is intended to be a painless lesson in reality, those critical steps that you learn over time, often by doing them wrong. For some, it will be a confirmation that you're getting it right, and for others it may be an "Aha!" moment. It would be more responsible, and more scientific, to verify each of my conclusions yourself. But, if you're like me, you readily accept ideas that are reasonable and seem right, and you choose to believe them. I've been uncertain at times, but I rarely regret a decision that comes from common sense.

Each chapter contains, in my opinion, the best way to deal with the various aspects of creating a trading system. All of the steps are important, and doing them incorrectly will show up later in your trading account, perhaps too late. It's better to spend a little extra time up front to increase your chances of success later on.

## THE GROUND RULES

Before we get immersed in the details, there are some important items to define and disclose.

First, we all have biases. They are often found in what we don't say rather than what we actually state. I see that when I watch the political commentary on television and also in the evening news. Everyone seems to have an agenda.

My own biases are toward fully automatic trading, which include all the good and bad of it. I also like macrotrend systems, stock and various other arbitrage, and some pattern recognition, among other methods that I can't remember right now. I don't like systems with a lot of rules and I'm suspicious of systems that work on only one market. I'm going to try to balance my examples to show short-term and long-term systems, but the reality is that there will probably be more about long-term trend following, which I believe is used by more traders, especially at the early stages when they are dangling their collective toes in the water.

## THE PROCESS

The process of developing a trading strategy involves eight well-defined steps, shown in Figure 1.1. These should be clear, except for the marks on the left that show "Change rules" and "Failed." From the top down, the trading idea comes first, then you need to get all the data that will be used to validate your strategy. You must have a trading platform to test your idea, which could be as simple as Excel, or as sophisticated as TradeStation. You enter your rules using that platform.

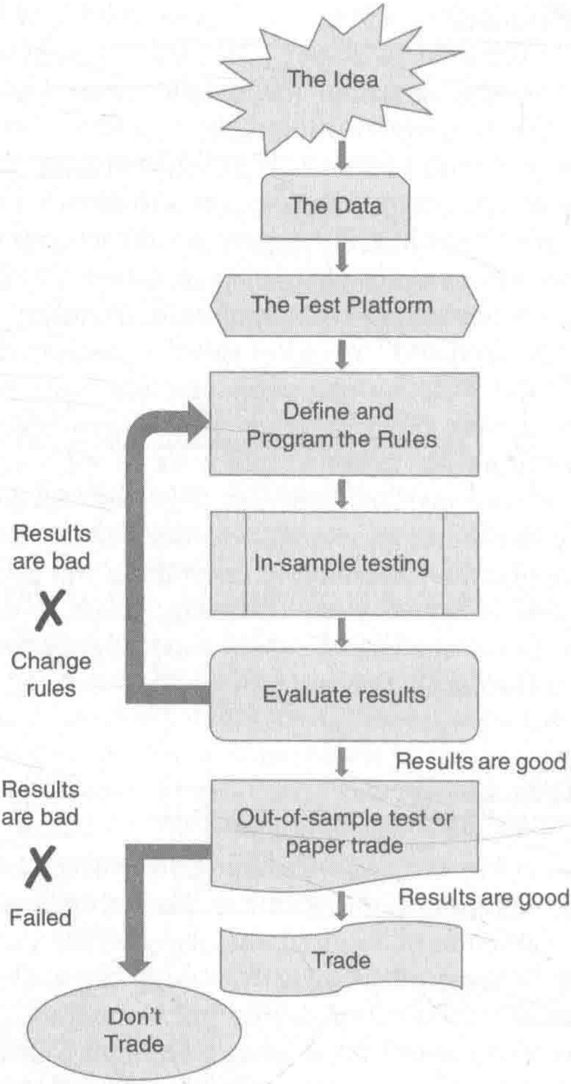


**FIGURE 1.1** The Development Process

You begin testing using in-sample data (more about this in Chapters 10 and 11) and evaluate the results. If they are not what you want, go back and change the rules, then retest them using the in-sample data. Continue to do this until you're satisfied with the results. Then test the strategy on out-of-sample data, which you've held aside and not used. If it works, and we'll explain what "works" means later, you're ready to trade.

However, it doesn't usually unfold that smoothly. When you use the out-of-sample data, the results are not as good as you expected. So you go back and change the rules. But now you no longer have the out-of-sample data that are needed to verify your work. Purists would say that, once you fail the out-of-sample test, then you need to discard the system and start with something new. But that never actually happens. We're sure that the method still works, but we've overlooked something that now seems obvious, such as using volatility instead of fixed values for placing the stop-loss. Or, we should have added profit-taking.

There is a way out. When you're all done testing and the results finally look good, you can paper trade. That way, you track the results with no money and see if they are close to your expectations. The problem is that it takes time and we're usually impatient to make money—or in some cases, to lose money. Experience says that there are probably still changes to be made, so paper trading is your punishment for looking at the out-of-sample data more than once.