Book Review

Title:	Trading Systems and Methods (Fifth Edition)
Author:	Perry J. Kaufman
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A BOOK REVIEW & INTERVIEW WITH PERRY KAUFMAN

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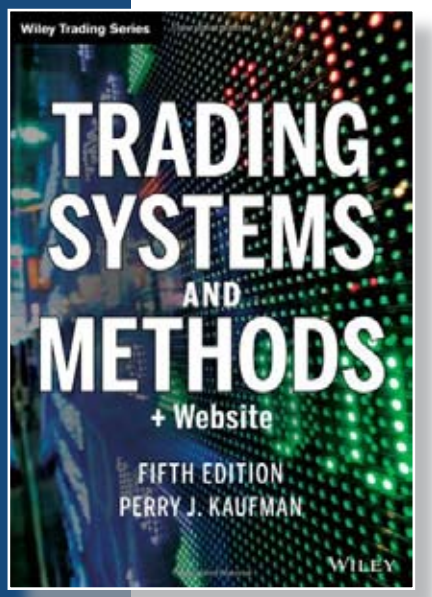
The Review

The term "heretics" of finance[1] was the nickname for technical analysts coined by Professor Andrew Lo, based on the fact that the academic world, at the beginning, saw technical analysis as a sort of alchemy and thought that technical analysis was to financial analysis as astrology was to astronomy. Despite these first historical misgivings, a high number of academics have studied technical analysis and have come to several interesting conclusions regarding its benefits and pitfalls[2].

For that reason we can say that technical analysis, as body of knowledge, has been built thanks to trading practitioners, who studied the market indepth and built their first sound theories, and also by subsequent studies from the academic world that, mainly in the last decades, have reinforced some of technical analysis axioms.



We also have the support from a third category of people, who do not come from an academic world, but have a strong scientific background. This is the case of Perry Kaufman who began his career as a "rocket scientist," first working on the Orbiting Astronomical Observatory (OAO-1), the predecessor of the Hubble Observatory, and then on the navigation for Gemini, later used for Apollo missions, and subsequently in military reconnaissance. In 1971 he became involved in the futures markets and has remained there. There is a certain connection between the construction of a trading program and the world of rockets; in fact, the earliest systematic programs used exponential smoothing, a technique developed in aerospace for estimating the path of missiles.

Perry Kaufman is definitely one of the scholars of reference in the field of technical analysis with regard to trading systems. One of the cornerstones of Kaufman's work has been the book *Trading System and Methods*, first published in 1978, and considered "the most authoritative and comprehensive work" in the industry.

In this article I will review the new fifth edition of that work, published in January 2013, trying to figure out if it is simply a reprint of the fourth edition with some updating, or a work in its own right, distinguishing it from previous editions.

Kaufman's book is one of the Chartered Market Technician Level 2 Exam reading assignments. At first glance it could be seen by the student as very difficult to digest its contents: two kilos of book with 1,212 pages, plus a website containing more than 400 programs and spreadsheets. But in reality, it is a book where you don't need to finish all the 1,212 pages to grasp the concept and value of the book itself. It can be read non-sequentially, in selected pieces, without losing context. It is possible to learn the basics of an argument after reading just a few pages. For this reason this book has been compared to an encyclopedia of trading systems, or to a comprehensive guidebook and cookbook of trading methods.

But in reading this fifth edition you see that there is another new peculiarity that has also been highlighted by the author: the added coherence from one section to another, and from one chapter to another. The search for an attempt to make the material flow from section to section as a continuous learning process. That is just not to give some blocks of recipes about trading, but to build a disciplined, coherent framework and a step-by-step course that provides the opportunity to increase our own culture on this subject in a critical and constructive way.

The objective of the author is to supply a complete understanding of the tools and techniques needed to develop and/or choose a trading program that has a good chance of being successful. There is no one Holy Grail technique, because all the experts in this field understand that it is not possible to know what will happen in the future; instead, the book evaluates the conditions under which certain methods are likely to do better, and situations that will be harmful to specific approaches. It is unlikely that any two traders will develop exactly the same system, but the challenge is to find a system that will adapt to future changes, that is, it should be robust, and the greater the knowledge of the trader, the more likely it will succeed.

To have a trading method that works in many different situations, and keeps working for as long as possible, is to have a robust solution. Because of its importance, there are comments throughout the book addressing the robustness of various methods and ways to enhance that quality.

But the main enhancement that we can find throughout the book, and which distinguishes this new edition from the older ones, is the concept of risk control, from the individual trade level, to the strategy rules, to the portfolio.

The previous edition was published in 2005, and from that period until today we saw too many black swans[3] in the financial markets. That has demonstrated the forecasting or measuring risk in this "new normal"[4] financial environment is not useful. Kaufman has shifted his attention to the management and control of risk, that is, more reactive and useful than the old solution.

The book is richer by 38 pages than the fourth edition, but the content is much greater. This is because all the TradeStation and spreadsheet programs disseminated in these pages have been removed and collected in a website built just for this new edition. On that website it is possible to download a large amount of material. As of the end of April, it contained 43 Excel spreadsheets, 25 MetaStock new functions, and for TradeStation we had 140 indicators, 117 strategies and 98 functions. That means more content than the previous edition, especially in the arbitrage section.

The book is structured in four parts: first we have an introduction, where the author speaks of the role of technical analysis and describes the resources and the objectives of the book (chapter 1). The second part is dedicated to the foundations: basic concepts and calculations (chapter 2) and charting (chapter 3).

The central part of the work is about trading techniques (chapters 4-20): the book remains organized in the same way, with the types of strategies covered starting with trend-following, momentum, cycles, and seasonality, then moving to the more complex arbitrage, intraday trading, and pattern recognition. In the last part we have the way in which we can build robust trading systems (chapters 21-24).

The Interview

Mario V. Guffanti (MVG) - Hi Perry, it's a great pleasure having you in an interview about your new fifth edition of "Trading Systems and Methods."

Perry Kaufman - Thank you, Mario. It is my pleasure to talk with you.

MVG - What are the main changes and additions that have been made to this new edition?

Perry Kaufman - If you don't mind, I've made a brief list of the changes because I knew you would ask this question:

1. I've made the notation consistent throughout the book, where before I used the notation of the various works that I was drawing on.
2. I've moved all the code and large tables to the website and only show a small piece of the tables. That allowed me to keep the book the same size but put in much more content.
3. I've tested nearly all of the "systems" in the book, and coded them, where before I may have simply summarized the concepts and formulas.
4. I've added more systems overall and in particular in the arbitrage section.
5. I've added risk analysis and more description throughout the book because I wanted to be sure that I was being clear. I've added some important concepts in the chapter on risk.
6. I've removed some old material and some sections that seemed to be repeated or of little value. I need to continue to do much more of this if the book is going to stay the same size.
7. I've added my concept of "noise" in chapter 1 and tried to explain its implications to all systems.
8. I've been more vocal about directing the reader towards some methods and away from others, or showing that they are very similar. For example, with long-term trend following and with typical momentum indicators, the results are nearly the same if you choose the right calculation period.

   Most of the charts and examples have been updated. Some readers may have a hard time relating to gold at $500 when it's $1,500.

MVG - If we look for a definition of what is technical analysis in the main classical books used as a basis to learn and study this discipline, I mean the cornerstone books also used in the first level of examination for technical analysts, such as Murphy[5], Pring[6], and Edwards and Magee[7], the topic is defined as the study of price, using charts to forecast the movement of future prices, or the identification of trends. In your introduction you affirm that technical analysis is no longer just the study of chart patterns or the identification of trend, but it encompasses intramarket analysis, complex indicators, mean reversion, mathematical forecasting, and the evaluation of test results. How much do you think your concept is really applied in the professional field and what has been the advantage for you in having this kind of forma mentis?

Perry Kaufman - It's true that technical analysis started as chart interpretation. Even today I'm sure that every trader looks at a chart to confirm whether the market is in an up or down trend, or looks overbought or oversold. Even when the trading is entirely systematic, it is safe to confirm your signals by looking at a chart (at least from

time-to-time). But I feel strongly that technical analysis has evolved because we identify trends and extremes automatically now. By using a computer instead of a pencil and ruler, we are able to find more situations, trade more markets, and create a risk-adjusted portfolio where we could never do that manually. Even high-frequency trading can be just identifying "micro-divergence" instead of macro patterns. It's really the same thing we've always done, just made faster and faster. Drawing trendlines across the bottom of swing lows can be done with a computer, and various formulas for trendlines (moving averages, linear regression) have replaced the manual approaches, and perform well. And, large investors seem to want a systematic solution because discretionary trading can be successful, but can also be unreliable and difficult to manage. Many feel that exploiting certain market patterns, whether trending or mean-reverting, have a more predictable outcome than chart interpretation, or fundamental analysis.

It is also possible to analyze world markets, and identify when those markets go out-of-line. Without a computer programmed to identify anomalies, it would be impossible to take advantage of all the opportunities.

One of the biggest challenges of "technical analysis" is to develop systems that show realistic results. At the beginning of computerized testing there was a significant failure due to overfitting. Most analysts have now learned that the "best" historic results are not likely to show what will be returned in the future. Taking a massive set of test results and reducing them to something realistic is what I would now call "the Holy Grail." And I think we are getting closer to doing that. We can never be perfect because future price patterns will never be the same as past patterns, so no past results will represent the future. But it can be close in the sense that you can estimate the likely returns, and the risk associated with those returns, over some reasonably long time periods. You just never know how the profits and losses will distribute in the future.

MVG – The events in international financial markets in recent years have led to reconsider the risk factors in the investment decision process. You affirm in your book that understanding how to reduce risk before the fact is much more productive than identifying it afterward. For that reason you introduced risk analysis throughout the book. An academic study published at the beginning of 2013[8] demonstrated that institutional portfolio managers who consider technical analysis to be very important for their investment decisions, outperform those who did not use it, especially during down months, that is, in negative market environments. Can we say that your new book, by reconsidering the role of risk analysis, could be considered not a really updated edition but a work in its own right?

Perry Kaufman – I hope so, and you've hit on the difference between "risk measurement" and "risk management." Since 2008 risk has taken on a different dimension. Before that, the typical belief was that diversification into different markets was enough. That turned out not to be true. What is true is that "money moves the market," not fundamentals. When there is market stress, everyone pulls their money out, causing all markets to reverse. That caused a correlation of 1.0, and a very, very unhappy situation for investors.

The book now takes the philosophy that trying to predict which market or which system will work best in the future is an unproductive approach. When you apply equal risk to every trade, equal risk to every sector, and so on, you are saying that you cannot know what the future will bring, but that over time, we expect our trading to work. I believe that is both the safest approach to risk management and a major step towards bringing expectations and reality closer together.

Trying to predict future risk is clearly never going to be perfect. Using past data can only reflect the risk in that data, so more data is always going to be better. The most common ways of measuring risk, annualized volatility and value-at-risk, are both good measures of current risk, but the only control over future risk is capping leverage. For many traders the idea of capping leverage means they get lower returns. But they also don't get wiped out. In futures, there is already built in leverage, typically 4:1 when you consider holding funds in reserve. If you are leveraging up in low-volatility periods, then you need to cap that added leverage at not much more than 3 for a number of reasons explained in the book. Then you have compounded leverage of 12:1, which seems more than enough. There are some UCITS funds that don't allow leverage of more than three times the market exposure, which may seem very low, but certainly serves their purpose of controlling future risk.

I would also like to point out that diversification into different strategies, such as trend following and arbitrage, is much safer than diversification into different markets. Again, we have become aware of that because of the failure of 2008. Trading different strategies will maintain the integrity of the portfolio through a much wider range of market performance.

MVG - When I began reading the book I noted that chapter 2 has a new part about "standard measurements of performance." You say that these performance measures will be used throughout the book when comparing different systems and they will be discussed further in chapter 21, System Testing. Could you explain how this differs from the fourth edition?

Perry Kaufman - This edition is much more complete with regard to testing systems. To allow readers to compare results, I've chosen the most popular statistic, the "information ratio," the annualized returns divided by the annualized volatility (standard deviation). I believe that is the single best measure, although other statistics can also be important. So it is the combination of more tests, better display of results, and consistent use of the information ratio that should help readers compare one method with another.

MVG - How would traders decide which type of system would be best for them? Are there general rules of thumb or do you have your own method to solve this problem?

Perry Kaufman - That's a very difficult question. Most traders are not a "blank slate," they have preferences such as trend following or short-term trading. If that is the case, then they can go to the chapter on that strategy and compare the rules and results of many approaches. They will need to concentrate on the reward to risk ratio, but they may want frequency of trading or larger profits per trade. Those are all personal decisions, but important ones. You will never be a success by trading a system that fights with your personality.

If you have no preference, then I suggest you start with long-term trend following. It's easy and it works. It doesn't demand much time, and entering the orders at a specific time is not critical. As you develop more skill, keeping some part of your portfolio in trend following still makes sense. Then you need to look for a strategy that gives you diversification. That would mean pattern recognition, arbitrage (for example, pairs) or some other mean reversion program. It will mean faster trading and keeping an eye on the market more, so that might not work for someone with a full-time job. But the point is to find some other way of trading that would complement trend following. My own favorites are the Taylor Trading Technique, intraday breakouts, and pairs, but they must all be adapted to the trader's style and carefully tested. The book gives guidelines for doing this correctly.

MVG - In the medical field we have moved from a physical semiotics to instrumental semiotics in the last few years. That is the where the good old medical doctors were competent to generate a diagnosis with a high probability of accuracy through a physical examination of the person before confirming it with an instrumental diagnosis. Today, relying too much on machinery could diminish the quality of the treatment, and focusing too much on technical readings and instruments for a cure may end up with the wrong analysis. Keeping the holistic approach seems the best course. It seems to me that the same is also happening in the world of trading systems, one point that you have highlighted in your book: namely the use and abuse of the computer. At the time of Charles Dow, when the use of computers was non-existent, those who created the first trading rules were heavily focused on the markets, on their price curves, and the psychology behind them. What is the secret to keeping this mindset in this super-technological world and having a sound and underlying premise to base our trading ?

Perry Kaufman - You've hit on a brilliant question, can a computer replace a person in making these decisions? I think the simplest way to view it is to compare a person who uses the full power of a computer to optimize a strategy, putting in as many rules and formulas as possible, without regard to whether any of those are meaningful. I've seen this done with neural network applications. The idea is to let the computer tell you what works and doesn't work. Let it discard all the unnecessary data. I find that the completely wrong approach. You cannot find a successful system by data mining. The results will look brilliant but have no chance of working.

The only way to find a successful trading strategy is to understand the market and to observe its patterns. You then arrive at what we both call a "sound premise." For example, you believe that interest rates are the result of monetary policy, so you use long-term trend following to track the effect of that policy on interest rate futures. Or, you decide that Hewlett-Packard and Dell should show similar price movement, so you want to arbitrage them when they move apart. Both are based on a fundamental understanding of the market, not on technology. Of course, having decided that arbitrage is a great way to trade, you can now use technology to speed up the trading signals and – voila! – you have high-frequency trading. So the answer is "holistic," that is, you combine the common sense of the trader with the power of technology, but the traders common sense is the more important part.

MVG - In your new edition you've added some new subsections. I saw three associated with the topic: "Early Exits from a Trend" (chapter 8), "Kaufman on Stops and Profit Taking" and "Entering a Position" (chapter 23). Can you tell why these were important enough to merit new subsections?

Perry Kaufman - Some of these deal with both the technique and philosophy of entering and exiting. For example, if you're a long-term trend follower, then exiting with profits, or using stops, fights with the underlying strategy. In order to have profits from trend following you need to capture the "fat tail," those very big profits that offset all the small losses. If you add profit-taking or stops to your trend system and exit while the trend is still intact, then you risk missing the really big profit and your system will eventually fail. So that these extra rules must be combined with a way of re-entering the trend trade so that you don't miss that rare big profit. I try to give the reader an understanding of the problem, the exceptions, and some examples of how to solve the problem. I think it's an important addition.

MVG - The Adaptive Market Hypothesis[9] affirms that markets are not always efficient, nor are they always irrational: they are adaptive. The behaviour that may seem irrational is, instead, behaviour that has not yet had sufficient time to adapt to modern contexts. Therefore, fixed investment rules that ignore changing environments will almost always have unintended consequences, and pattern recognition, in any form, may yield important competitive advantages. These axioms seem to be almost a paraphrase of what you wrote when describing the search for the robustness of a trading system: your rule number two being that the characteristics of a system with the best forecasting ability is that it must adapt to changing market conditions. In addition, I also found very useful the chapter about price shocks, which can be considered a very important part in the construction of a trading system to avoid catastrophic losses. Can you tell us in an Occam' Razor style ("One should not increase, beyond what is necessary, the number of entities required to explain anything"), your view about this topic?

Perry Kaufman - The market itself evolves. In the 1990s, Toby Crabel published his book on intraday breakouts where he used fixed points to define the breakout. For example, if T-Notes opened at 110 and rallied 4/32nds, then we buy. But 4/32nds doesn't work if the market has a different volatility. You entered either too soon or too late. And then we all know that price movement, even across different markets, has become more correlated. In the subprime collapse of 2008 all the markets moved together, not because of fundamentals, but because money moves the market. From that, we have evolved a much better way of managing risk.

Another part of this question is "How long will a system work?" I can't answer that. Some continue to work, such as trend following, but other pattern recognition systems only work for a short time. I can say that you must monitor the performance and be able to recognize

when a system is no longer doing what it should, before you lose all your money. A system developer might want to read Dietrich Dörner's book, *The Logic of Failure*, because it explains the importance of monitoring your work.

As for price shocks, yes, they are rare but important events that can cause you to fail. You can't ignore them, so I give various ways you can deal with them and still survive.

MVG - Martin Pring defined technical analysis as an art. Antti Ilmanen, fund manager and researcher, wrote that investment activity is both art and science: however, a good scientific background can enhance the artist. What's your opinion?

Perry Kaufman - Of course I believe that a scientific background is a great advantage, but common sense and discipline will work also. You don't need to be a rocket scientist, but you do need to be systemactic, that is you should have clear rules that you follow. If you are skilled at using development software, such as TradeStation and MetaStock, then you must test your work correctly and accept bad results. While discretionary traders may make huge profits from time to time, my own approach is to create a system that grinds out profits, with a certain level of risk, over time. And, I think that approach has become more popular among both traders and investors.

MVG - The book is written very clearly, but it is also very challenging with its 1,212 pages. What kind of advice would you give to the first-time reader, or the trader who is just starting?

Perry Kaufman - I try to give an overview of the topics at the beginning of each chapter, so I would start simply by reading the first page or two of each chapter. Then go back to the chapters that seem most interesting to you. The chapters each progress from simple to more complex, so you can stop any place and pick it up later. Or, if you have an idea of a method that interests you, you can always look it up in the index and start there.

MVG - You dedicated your book to your wife Barbara, and in the preface you thank Barbara for her everlasting support that is only enhanced by rolling her eyes whenever you say that "this is my last book, ever." Did you make this promise again?

Perry Kaufman - I always promise and it's always not true.

MVG - This reminds me an aphorism attributed to Winston Churchill: "There are three great things in the world: the oceans, the mountains, and an engaged person." Thank you, Perry.

Footnotes

1 A. Lo and J. Hasanhodzic – *The Heretics of Finance* – Bloomberg Press – 2009

2 See A.Lo and J Hasanhodzic – *The Evolution of Technical Analysis* – Bloomberg Press – 2012 - Chapter 7, 8 and C. D. Kirkpatrick & J. R. Dahlquist – *Technical Analysis* – 2 ed. - Chapter 4 – Pearson Education – 2011;

3 The term "Black Swan" was created by Nassim Taleb, Distinguished Professor of Risk Engineering at New York University's Polytechnic Institute, to indicate an isolated event that does not fall within the normal expectations, because nothing in the past may indicate its existence;

4 "The New Normal," is a term that Bill (William H.) Gross coined in March, 2009, to define the economic landscape for years, or decades, to come. "When the U.S. and global economy reset after the crisis, [the global economy] will look different," says (Mohamed) El-Erian of PIMCO. "This has implications for investment strategies, how you run a business and what you offer your clients."

5 Murphy, John J.: *Technical Analysis of the Financial Markets*, New York Institute of Finance, New York, NY, 1999;

6 Pring, Martin J.: *Technical Analysis Explained*, 4th (or current) Edition, McGraw Hill Book Company, New York, NY, 2001;

7 Edwards, Robert D. and Magee, John, *Technical Analysis of Stock Trends,* 9th (or current) Edition (2001-2008), John Magee Inc., Chicago Illinois 2001;

8 Smith, Faugère & Wang – 2013 *Head and Shoulders Above the Rest? The Performance of Institutional Portfolio Managers Who Use Technical Analysis* - http://papers.ssrn.com/sol3/papers.cfm?abstract_id=2202060

9 Lo – *The Evolution…* - Chapter 8 – Adaptive markets and Technical Analysis

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