

# MICROSOFT® EXCEL® FOR STOCK AND OPTION TRADERS

BUILD YOUR OWN ANALYTICAL TOOLS  
FOR HIGHER RETURNS



**J E F F   A U G E N**  
AUTHOR OF *THE VOLATILITY EDGE IN OPTIONS TRADING*

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Publishing as FT Press  
Upper Saddle River, New Jersey 07458

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Printed in the United States of America

First Printing April 2011

ISBN-10: 0-13-713182-8

ISBN-13: 978-0-13-713182-2

Pearson Education LTD.

Pearson Education Australia PTY, Limited.

Pearson Education Singapore, Pte. Ltd.

Pearson Education North Asia, Ltd.

Pearson Education Canada, Ltd.

Pearson Educación de México, S.A. de C.V.

Pearson Education—Japan

Pearson Education Malaysia, Pte. Ltd.

Library of Congress Cataloging-in-Publication Data

Augen, Jeffrey.

Microsoft Excel for stock and option traders : build your own analytical tools for higher returns / Jeffrey Augen.

p. cm.

ISBN 978-0-13-713182-2 (hbk. : alk. paper)

1. Investment analysis—Computer programs. 2. Investment analysis—Mathematical models. 3. Microsoft Excel (Computer file) I. Title.

HG4515.5.A94 2011

332.640285'554—dc22

2011003034

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*To Lisa, who changed everything when she said:  
“Why don’t you just calculate the integral between  
those two points and chart the value as  
it changes over time?”*

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## Acknowledgments

I would like to thank the team that helped pull the book together. First must be Jim Boyd, who encouraged me to continue the project and always seems willing to explore new areas and concepts. This book would never have made it to print without advice and direction from Jim. Once again it was my pleasure to work with Betsy Harris, who always does a terrific job turning a rough manuscript into a polished, production-quality book. In that regard, I must also thank Cheri Clark, who carefully read every word and made corrections that put the finishing touch on the work. Finally, I'd like to acknowledge the important contributions of a friend—Robert Birnbaum. Over the past several months, Robert has helped shape my thinking about the statistical relevance of trends—ideas which surfaced in some of the key examples and continue to weigh heavily in my own investing.

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## About the Author

**J**eff Augen, currently a private investor and writer, has spent more than a decade building a unique intellectual property portfolio of databases, algorithms, and associated software for technical analysis of derivatives prices. His work, which includes more than a million lines of computer code, is particularly focused on the identification of subtle anomalies and price distortions.

Augen has a 25-year history in information technology. As cofounding executive of IBM's Life Sciences Computing business, he defined a growth strategy that resulted in \$1.2 billion of new revenue and managed a large portfolio of venture capital investments. From 2002 to 2005, Augen was President and CEO of TurboWorx Inc., a technical computing software company founded by the chairman of the Department of Computer Science at Yale University. His books include *Trading Realities*, *Day Trading Options*, *Trading Options at Expiration*, *The Option Trader's Workbook*, and *The Volatility Edge in Options Trading*. He currently teaches option trading classes at the New York Institute of Finance and writes a weekly column for *Stocks, Futures and Options* magazine.

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## Preface

In August 2010, Cisco stock (ticker: CSCO) hovered just a few cents below \$25. Several analysts identified the stock as a strong buy. They pointed to the rising demand for network infrastructure that, among other things, was being driven by explosive growth in online video gaming and Internet television. Cisco, they believed, would continue to dominate the consumer market while benefiting from a weak dollar and low manufacturing costs. They must have been wrong because the stock fell 15% when earnings were released on August 11. The price continued to decline until August 31, when it bottomed out at \$19—24% below its previous high. About the time that everyone had given up and turned bearish, the stock began to rally. On November 10 the price was, once again, back up to \$24.50. Then came another earnings report and another sharp decline. The price immediately fell 16% and continued plunging until, on December 3, it once again bottomed out at \$19. These bizarre dynamics played out a third time, with the stock rallying steadily to \$22 on February 9, 2011, before falling back to \$18.92 the very

next day after earnings were released—another 14% decline. Figure P.1 displays Cisco closing prices from June 1, 2010, to February 11, 2011.

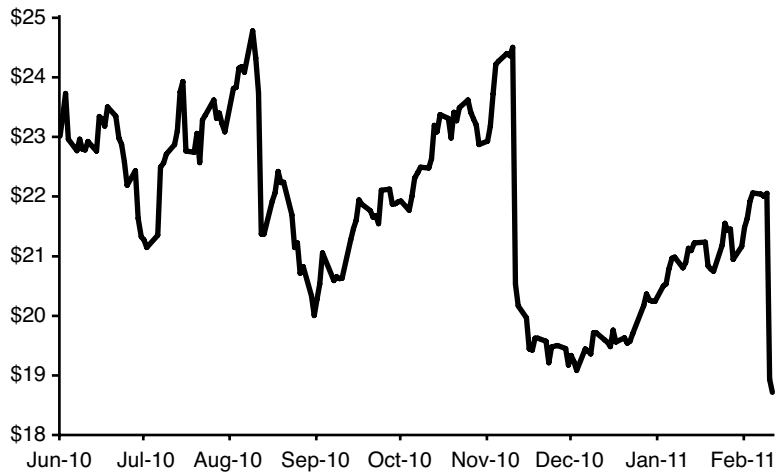


FIGURE P.1 *CSCO closing prices June 1, 2010 to February 11, 2011.*

Wild unpredictability doesn't seem to discourage speculators because the trading volume for Cisco remains shockingly high. Moreover, the number of investors who bet on the direction of the stock seems to peak just before and after earnings—the most dangerous times of all. For example, the trading volume climbed above 125 million shares on February 9, 2011 (before earnings), and skyrocketed to 560 million shares the next day after the numbers were released. Each of the previously outlined events was accompanied by a similar pattern of extremely high volume the day before earnings were announced and even higher volume the day after.

Who would trade this completely unpredictable stock? Why does the volume soar at the most dangerous times when anything seems possible? More importantly, why do analysts believe that they know enough to make predictions? The answers are simple. Analysts can make all the predictions they want because it's not their money that ends up being lost, and speculators always believe they can find a bargain. As a group, investors tend to be arrogant. They typically believe that they have unique insights and that these insights give them an advantage over the market. One of the most common mistakes is relying on traditional off-the-shelf technical indicators that often prove to be even less reliable than fundamental analysis. The Cisco story represents one of the best examples of the problem.

Various technical indicators signaled that the stock would continue to rally just before each of the sharp declines displayed in Figure P.1. They were clearly wrong. Moreover, technical indicators cannot be valid if the underlying trend being analyzed is statistically insignificant. Yet technical analysts routinely talk about moving-average crosses, momentum, or relative strength, without any reference to the statistical strength of the underlying trend being studied. We can compile the relevant statistics for any stock in just a few seconds by loading the information into a spreadsheet and applying Excel's r-squared function. Not surprisingly, the test reveals that most trends appearing on stock charts have very low statistical significance. For Cisco, a relatively weak r-squared value of 0.7 is achieved less than 30% of the time using a 10-day sliding window. Highly significant trends with r-squared values above 0.9 occur with a frequency less than 5%. Table P.1 displays r-squared data for 2 years of Cisco stock.



TABLE P.1 *Compiled r-squared values for Cisco stock February 2009 to February 2011. Calculations span a 10-day sliding window.*

	rsq>.9	rsq>.8	rsq>.7	rsq>.6	rsq>.5
Days	24	96	146	189	238
Percent	4.8%	19.4%	29.5%	38.2%	48.1%

The table is divided into columns that reveal the number and percentage of days appearing in trends with minimum r-squared values listed in the column headings. In some sense the data represents a dose of reality. It is common, for example, to hear a technical analyst turn bullish because the 50-day moving average has crossed above the 200-day moving average. However, it is unlikely that you will ever hear the same analyst report the r-squared value of the current trendline. Fortunately, however, most good trading platforms have an r-squared function that can display on a chart, and the data can be exported to a spreadsheet where more detailed analysis can be used to study different length windows and combinations of indicators. This kind of analysis can be used to validate, invalidate, or tune combinations of indicators and give investors an edge against the market. In today's complex computer-driven markets, this kind of analysis can make the difference between winning and losing.

Modern trading platforms always include sophisticated tools for back-testing indicators and strategies. But before a strategy can be tested, it must first be developed, and that development is best accomplished on a foundation of statistical analysis. Spreadsheets and databases are the perfect platform for that kind of technical work. In most cases the process involves a sequence of basic questions designed to reveal the statistical behavior of a stock following a specific set of conditions. There is virtually no limit to the size, number, or

complexity of the experiments that can be performed to search for unique correlations that are not generally known to the market.

This book is designed to help technically minded private investors learn to run just a little faster than the market. A few years ago the discussion would have been too complex to be generally useful because it would have been focused on data mining strategies in large databases. That has all changed. Most of the complex statistical analysis and model building that a few years ago could only be accomplished at the institutional level is now within the reach of any investor with a trading platform and a copy of Microsoft Excel. This book is built on that theme. It is designed to help investors learn to translate complex questions into simple spreadsheet models. The discussions span a range from simple conditionals and logical expressions to relatively complex VBA programs that generate statistical summary tables. My goal was to include content that can add value to the efforts of a wide range of investors and to challenge everyone to improve their analytical capabilities.

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## *Chapter 1*

# Introduction— The Value of Information

### *The Struggle for a Statistical Edge*

**T**he equities markets are a zero sum game in the sense that every dollar won must also be lost. This simple fact has far-reaching implications that are sometimes counterintuitive. For example, most investors do not realize that the investment community as a group cannot profit from the rise of a single stock unless the company pays a dividend. This limitation exists because all profit must emanate from buying and selling activity between the investors themselves. Although individual trades can certainly generate a positive return, there is a finite amount of money in the system and the source of that money is the individual investors. The markets are the ultimate expression of capitalism—someone always wins and someone else always loses.

The game manifests itself as a struggle between buyers and sellers. To consistently win the struggle, you must have an advantage—either technical or informational. Unfortunately, a growing population of today's

investors engages in illegal insider trading. They have an undeniable advantage because they make investment decisions based on information not available to the general public. It is sometimes easy to spot insider trading activity. It often takes the form of a large purchase of inexpensive out-of-the-money options just before a surprise news announcement. Not surprisingly, many investors subscribe to fee-based services that track suspicious option trading activity. Unfortunately, the picture is colored by rumors and it is relatively difficult to capitalize on this type of information.

My introduction to the world of insider trading came many years ago, in June 1995, when IBM purchased Lotus Development Corporation. On Thursday, June 1, Lotus stock closed at \$29.25, but the volume of out-of-the-money \$40 strike price calls had risen from nearly zero to more than 400 contracts for no apparent reason. The trend continued on Friday, with the stock closing at \$30.50 and 416 of the \$40 calls trading for \$3/16 (just over 18 cents).<sup>1</sup> On Monday, June 5, the stock closed at \$32.50, and the volume of the \$40 calls jumped to 1043 contracts at \$9/16 (56 cents). The next day, after the announcement, the stock closed at \$61.43 and the \$40 strike price calls traded for \$21.75—a 3800% profit. The \$58,000 invested in these options the previous day was now worth nearly \$2.3 million. Someone knew something and it was reflected in active trading of deep out-of-the-money, nearly worthless calls. This sort of blatantly illegal activity is far more common than most investors realize. It drives markets at all levels and takes many different forms. Investment tips from brokers to their friends about unannounced merger and acquisition activity, information leaks ahead of government reports, corporate executives who exercise options immediately before a stock decline, market timing and late trading in mutual

funds, and large net-worth investors who manipulate thinly traded stocks represent a small portion of the problem. Needless to say, the financial markets are not a level playing field. Some of the most notorious examples of insider trading occurred just before the September 11, 2001, terrorist attacks when put contract volumes soared for American and United Airlines, residents of the World Trade Center (Morgan Stanley) and reinsurance companies. The German Central Bank President, Ernst Welteke, later reported, “There are ever clearer signs that there were activities on international financial markets that must have been carried out with the necessary expert knowledge.”<sup>2</sup> Insider trading before the 9/11 attacks was not confined to stocks. The markets also saw surges in gold, oil, and 5-year U.S. Treasury Notes—each considered to be a solid investment in the event of a world crisis.

The typical investor lives at the other end of the spectrum. He is not involved in illegal insider trading and must find profit opportunities using off-the-shelf charting tools, financial news broadcasts, information available on the World Wide Web, and broker-supplied trading software. Most investors use both technical charting and fundamental analysis to make trading decisions. Some day trade while others structure longer term positions. Regardless of the approach, each investor must compete against the market (including the insiders) using information that is freely available to everyone. Advantages can be gained only by those who have unique insights or approaches that have not been discovered by their competitors. Unfortunately, a valuable insight that reliably generates profit will be short-lived if it truly represents an inefficiency in the market. Calendar effects—*anomalies in stock returns that relate to the calendar*—are one of the most interesting examples of this phenomenon.

Such anomalies have been the object of extensive investigation for many years. They include day, week, month, and holiday distortions. Their names are descriptive—January effect, turn-of-month effect, turn-of-quarter effect, end-of-year effect, Monday effect, and so on. In August 2000, the Federal Reserve Bank of Atlanta published a paper on the turn-of-month (TOM) effect.<sup>3</sup> The research was designed to address assertions by financial economists that returns are unusually large beginning on the last trading day of the month and continuing forward three trading days. S&P 500 futures contract prices were scrutinized for evidence of TOM between 1982 and 1999. The study also addressed the possibility of significant return differences across TOM days using a complex set of classification rules that incorporated day-of-week information. The report illuminates the complexity of this and similar questions. Briefly stated, TOM effects disappear after 1990 for the S&P 500 futures contract, and these results carry over to the spot market. The change occurred just after researchers began publishing papers about the phenomenon. More subtle day-of-week and time-of-day effects seemed to be related to a shift in preference from direct stock to mutual fund purchases that occurred throughout the 1990s.

The Federal Reserve Bank's study is a sharp contrast to the large number of papers that purport to reveal new trading opportunities based on calendar effects. It makes two key points:

1. Turn-of-month return patterns are constantly subject to change because they depend on highly variable market microstructure.
2. Such opportunities cannot persist once they are widely known.

The rapid disappearance of the effect following its discovery strongly supports the Efficient Market Hypothesis (EMH) first proposed by Eugene Fama in his Ph.D. thesis at the University of Chicago Graduate School of Business in the early 1960s. EMH recognizes three basic forms of efficiency:

1. *Weak-form efficiency* implies that technical analysis will not be able to consistently produce positive returns. However, the weak-form model recognizes the possibility of producing some return based on fundamental analysis of business performance and economic climate.
2. *Semi-strong efficiency* assumes that share prices adjust to publicly available information almost instantaneously, making it impossible to place profitable trades using new, publicly available information.
3. *Strong-form efficiency* is based on the assertion that share prices reflect all available information—including information known only to insiders—at any given moment in time.

Despite efforts to curb insider trading, there is considerable evidence that U.S. equity and fixed income markets are efficient at the strong-form level. This level of efficiency is sometimes misinterpreted to imply that an individual investor cannot generate positive returns. That is not the case because the performance of the overall group fits a normal distribution that contains both winners and losers. However, the likelihood of consistently winning in a perfectly efficient market is greatly diminished. Furthermore, it is possible to generate a positive return in a rising market, and to have that return erased by currency-exchange-rate changes. Such was the case during most of 2007, when American investors saw the Dow Jones Industrial Average rise steeply while European investors lost money.



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