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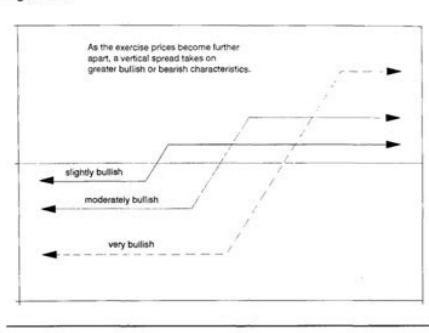
Natenberg options volatility and pricing pdf

Volatility increase option price. Options volatility and pricing sheldon natenberg pdf. Volatility vs option price.

1. *Adjust at regular intervals*—In theory, the adjustment process is assumed to be continuous because volatility is assumed to be a continuous measure of the speed of the market. In practice, however, volatility is measured over regular time intervals, so a reasonable approach is to adjust a position at similar regular intervals. If a trader's volatility estimate is based on daily price changes, the trader might adjust daily. If the estimate is based on weekly price changes, he might adjust weekly. This is a trader's best attempt to emulate the assumptions built into the theoretical pricing model.
2. *Adjust when the position becomes a predetermined number of deltas long or short*—Very few traders insist on being delta neutral all the time. Most traders realize that this is not a realistic approach, both because a continuous adjustment process is physically impossible, and because no one can be certain that all the assumptions and inputs in a theoretical pricing model, from which the delta is calculated, are correct. Even if one could be certain that all delta calculations were accurate, a trader might still be willing to take on some directional risk. But a trader ought to know just how much directional risk he is willing to accept. If he wants to pursue delta neutral strategies, but believes that he can comfortably live with a position which is up to 500 deltas long or short, then he can adjust the position any time his delta position reaches this limit. Unlike the trader who adjusts at regular intervals, a trader who adjusts based on a fixed number of deltas cannot be sure how often he will need to adjust his position. In some cases he may have to adjust very frequently; in other cases he may go for long periods of time without adjusting. The number of deltas long or short a trader chooses for his adjustment points depends on the size of his positions and his capitalizations. A small, independent trader may find that he is uncomfortable with a position which is even 200 deltas long or short, while a large trading firm may consider a position which is several thousand deltas long or short as being approximately delta neutral.
3. *Adjust by feel*—This suggestion is not made facetiously. Some traders have good market feel. They can sense when the market is about to move in one direction or another. If a trader has this ability, there is no reason why he shouldn't make use of it. For example, suppose that the underlying market is at 50.00 and a trader is delta neutral with a gamma of -200. If the market falls to 48.00, the trader can estimate that he is approximately 400 deltas long. If 400 deltas is the limit of risk he is willing to accept, he might decide to adjust at this point. If, however, he is also aware that 48.00 represents strong support for the market, he might choose not to adjust under the assumption that the market is likely to rebound from the support level. If he is right, he will have avoided an unprofitable adjustment. Of course, if he is wrong and the market continues downward through the support level, he will regret not having adjusted. If the trader is right more often than not, there is no reason why he shouldn't take advantage of this skill.

Page 1 Option Volatility and Pricing 00-Natenberg_FM.indd 1 16/10/14 5:02 PM This page intentionally left blank S E C O N D E D I T I O N Option Volatility and Pricing Sheldon natenberg N E W Y O R K C H I C A G O S A N F R A N C I S C O L I S B O N L O N D O N M A D R I D M E X I C O C I T Y M I L A N N E W D E L H I S A N J U A N S E O U L S I N G A P O R E S Y D N E Y T O R N T O advanced trading Strategies and techniques 00-Natenberg_FM.indd 3 16/10/14 5:03 PM Copyright © 2015 by Sheldon Natenberg. All rights reserved. Except as permitted under the United States Copyright Act of 1976, no part of this publication may be reproduced or distributed in any form or by any means, or stored in a database or retrieval system, without the prior written permission of the publisher, with the exception that the program listings may be entered, stored, and executed in a computer system, but they may not be reproduced for publication. ISBN: 978-0-07-181878-0 MHID: 0-07-181877-4. eBook conversion by codeMantra Version 1.0 All trademarks are trademarks of their respective owners. Rather than put a trademark symbol after every occurrence of a trademarked name, we use names in an editorial fashion only, and to the benefit of the trademark owner, with no intention of infringement of the trademark. 65437834392.pdf Where such designations appear in this book, they have been printed with initial caps.

Figure 10-3

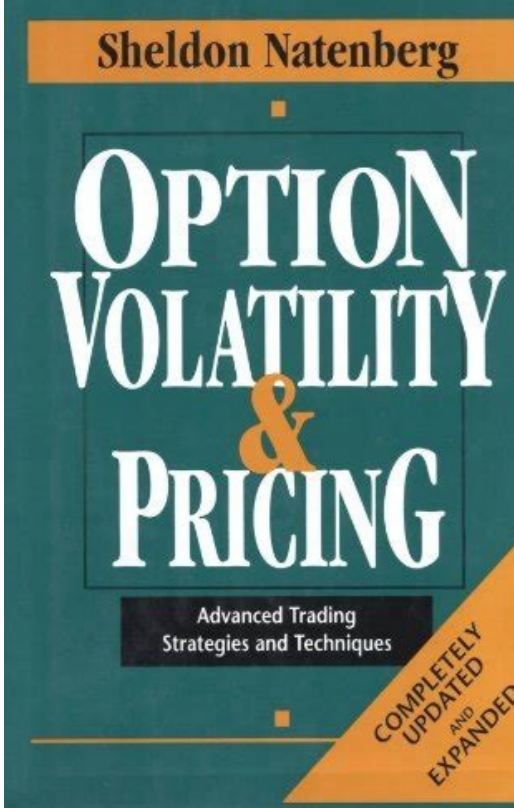


above, and out-of-the-money put. The assumptions include an underlying price of 100, 22 weeks to expiration, a volatility estimate of 20%, and an interest rate of 6%.

Figure 10-4: A table showing the relationship between the underlying price of a call option and its delta. The x-axis represents the underlying price, and the y-axis represents the delta. The table shows that as the underlying price increases, the delta also increases, and the rate of change (gamma) is highest when the underlying price is near the strike price.

Underlying Price	Delta	Gamma	Theta	Vega
100.00	0.50	0.10	-0.05	0.15
100.25	0.52	0.12	-0.06	0.14
100.50	0.54	0.14	-0.07	0.13
100.75	0.56	0.16	-0.08	0.12
101.00	0.58	0.18	-0.09	0.11
101.25	0.60	0.20	-0.10	0.10
101.50	0.62	0.22	-0.11	0.09
101.75	0.64	0.24	-0.12	0.08
102.00	0.66	0.26	-0.13	0.07

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To Eddie, who continually makes me proud to be a father. 00-Natenberg_FM.indd 5 10/10/14 9:28 PM This page intentionally left blank vii Contents Preface xiii 1 Financial Contracts 1 Buying and Selling 5 National Value of a Forward Contract 6 Settlement Procedures 6 Market Integrity 10 2 Forward Pricing 12 Physical Commodities (Grains, Energy Products, Precious Metals, etc.) 14 Stock 15 Bonds and Notes 17 Foreign Currencies 17 Stock and Futures Options 19 Arbitrage 19 Dividends 22 Short Sales 23 3 Contract Specifications and Option Terminology 26 Contract Specifications 26 Option Price Components 32 4 Expiration Profit and Loss 37 Parity Graphs 38 5 Theoretical Pricing Models 52 The Importance of Probability 53 A Simple Approach 57 The Black-Scholes Model 61 00-Natenberg_FM.indd 7 10/10/14 9:28 PM viii C O N T E N T S 6 Volatility 69 Random Walks and Normal Distributions 69 Mean and Standard Deviation 73 Forward Price as the Mean of a Distribution 76 Volatility as a Standard Deviation 77 Scaling Volatility for Time 78 Volatility and Observed Price Changes 80 A Note on Interest-Rate Products 81 Lognormal Distributions 82 Interpreting Volatility Data 85 7 Risk Measurement 197 The Delta 100 The Gamma 105 The Theta 108 The Vega 110 The Rho 111 Interpreting the Risk Measures 112 8 Dynamic Hedging 119 Original Hedge 122 9 Risk Measurement II 135 Delta 135 Theta 141 Vega 145 Gamma 149 Lambda (Λ) 154 10 Introduction to Spreading 158 What Is a Spread? 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442 Stock Index Futures 451 Stock Index Options 459 23 Models and the Real World 464 Markets Are Frictionless 465 Interest Rates Are Constant over the Life of an Option 467 Volatility Is Constant over the Life of the Option 469 Trading Is Continuous 472 00-Natenberg_FM.indd 10 10/10/14 9:28 PM C O N T E N T S xi Expiration Straddles 477 Volatility Is Independent of the Price of the Underlying Contract 479 Underlying Prices at Expiration Are Lognormally Distributed 479 Skewness and Kurtosis 482 24 Volatility Skews 485 Modeling the Skew 490 Skewness and Kurtosis 496 Skewed Risk Measures 499 Shifting the Volatility 501 Skewness and Kurtosis Strategies 502 Implied Distributions 507 25 Volatility Contracts 512 Realized Volatility Contracts 513 Implied Volatility Contracts 515 Trading the VIX 524 Replicating a Volatility Contract 535 Volatility Contract Applications 537 Afterword: A Final Thought 539 A Glossary of Option Terminology 540 B Some Useful Math 554 Rate-of-Return Calculations 554 Normal Distributions and Standard Deviation 555 Volatility 557 Index 559 00-Natenberg_FM.indd 11 10/10/14 9:28 PM This page intentionally left blank P R E F A C E xiii Preface It probably seems strange for an author to wait 20 years to revise a professional publication, especially one that has been continuously in print over the entire period. To those of you who were hoping for at least one revision in the inter-vening years, I can only offer my apology and the excuse that other obligations prevented me from undertaking such a revision. Much has changed in option markets over the last 20 years. Most mar-kets are now fully electronic, and the days of floor trading are clearly num-bered. do ultrasonic pest repellents work on bedbugs Only in the United States do option-trading floors still exist, and even those are inevitably giving way to electronic trading. Twenty years ago, orga-nized option markets existed only in the major industrialized nations. But as the importance of derivatives as both an investment vehicle and a risk-man-agement tool has become widely recognized, new option markets have opened in countries around the world. Options are now traded not only on traditional products—stocks, interest rates, commodities, and foreign currencies—but also on a bewildering array of new products—real estate, pollution, weather, infla-tion, and insurance. Many exchanges have also added variations on traditional products—short-term and midcurve options, flex options, options on spreads, and implied and realized volatility contracts. Not only has there been a dramatic increase in the number of option mar-kets, but the traders on those markets have become increasingly sophisticated. When this text was first published, knowledgeable traders could only be found at firms that traded derivatives professionally—market-making firms, hedge funds, investment banks, and other proprietary trading firms. Now, many retail customers have a level of knowledge equal to that of a professional trader.



At the same time, universities are adding or expanding programs in financial engineering. In many cases, those who choose a career in derivatives trading have already had in-depth exposure to the mathematics of option pricing. While much has changed in the last 20 years, much has also remained the same. There is still a core body of material that a serious option trader needs to master, and this core material is much the same as it has always been. mcgraw_hill_physical_science_chapter_3_review_answers The previous edition of this text was an attempt to present this material in a manner that was easily accessible and that did not require a familiarity with advanced mathematics. This edition retains that approach. Although some presentations may have been changed in the interest of improving an expla-nation or clarifying a concept, all the major topics from the previous edition have been retained. fresher electrical engineer resume pdf 00-Natenberg_FM.indd 13 10/10/14 9:28 PM So what's new in this edition? As in the first edition, an attempt has been made to explain important concepts in the simplest possible manner using an intuitive rather than mathematical approach. goblin stat block 5e However, it is also true that a full understanding of many option concepts requires a familiarity with more ad-vanced mathematics. Consequently, some explanations have been expanded to include a discussion of the relevant mathematics. But even these discussions tend to avoid mathematical concepts with which many readers are unlikely to be familiar. Many chapters have also been expanded to include a more detailed discussion of the relevant topics. In addition, there are several completely new chapters covering forward pricing, risk dynamics, the Black-Scholes model, binomial option pricing, and volatility contracts. As with any living language, market terminology, and more specifically, op-tion terminology, has changed over time. Some terms that were common when the first edition appeared have gone out of favor or disappeared completely. Other terms that did not previously exist have gained wide acceptance. This is reflected in small changes to the vocabulary used in this text. It is almost impossible to keep up with the amount of information that is available on options. Not only do new books appear with greater frequency, but the Internet has enabled traders to find relevant source material almost instan-taneously. For this reason, the Bibliography has been eliminated. This should not be construed as an attempt to discourage readers from consulting other sources. This book represents only one approach to option—not that of a pro-fessional trader. Many excellent option books are available, and any aspiring option trader will want to consult a broad range of texts in order to understand the many different ways one can approach option markets. For those who are interested in the mathematics of option pricing, this text is in no way meant to take the place of a good university textbook on financial engineering. Nothing in this text is really new, and all the concepts will be familiar, in one form or another, to most experienced option traders. 6983856307.pdf The presentation represents my best attempt, as an option educator, to present these concepts in a clear and easily accessible manner.

Early Exercise of American Options

Thus far we have assumed that all option strategies involve holding a position to expiration. Since the great majority of exchange traded options are American, carrying with them the right of early exercise, it will be worthwhile to consider some of the characteristics of American options. Specifically, we will want to answer two questions:

1. Given the opportunity, under what circumstances might a trader consider exercising an American option prior to expiration?
2. How much more should a trader be willing to pay for an American option over an equivalent European option?

In order for early exercise to be desirable, there must be some positive cash flow which will result from early exercise, and the value of this cash must be greater than the insurance value of the option. Because the cash flow which results from the exercise of a stock option is significantly different from the cash flow which results from the exercise of a futures option, the conditions under which early exercise will be desirable are different. For this reason, we will look at these two situations separately.

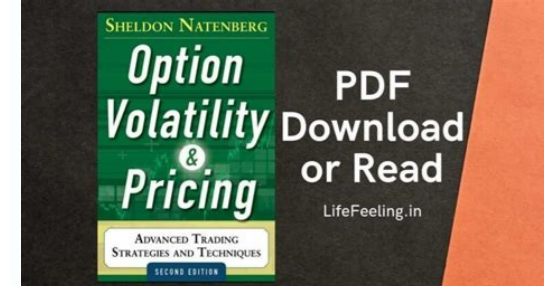
FUTURES OPTIONS

From previous discussions (see Chapter 6) we know that in evaluating an option there are some factors which make the option more valuable and there are some factors which make the option less valuable. Consider a futures option. We might list the factors which affect its value as follows:

$$\text{option value} = \text{intrinsic value} + \text{volatility value} - \text{interest rate value}$$

Since the intrinsic value and volatility components can never be less than zero, these factors always enhance the option's value. As either rises, the option value rises. Only the interest rate component might affect the option's value negatively. As interest rates rise, the option's value falls. If the negative effects of interest rates are greater than the positive effects of volatility, it might be possible for an option, if it is

The material is based not only on what I have personally learned throughout my career but also on the knowledge and experiences of many others with whom I have been privileged to work. In particular, my colleagues Tim Weithers and Samuel Kadziela offered many helpful comments and insights and in some cases rescued me from embarrassing errors. Any remaining errors, of which there are almost certainly a few, are strictly my own. I make no claim to having found a magic secret to successful option trading.



Anyone seeking such a formula will have to look elsewhere.

The secret, if there is one, is in learning as much as possible, applying in the real world what has been learned, and analyzing both one's successes and one's failures. Sheldon Natenberg xiv P R E F A C E 00-Natenberg_FM.indd 14 10/10/14 9:28 PM Academia.edu uses cookies to personalize content, tailor ads and improve the user experience. By using our site, you agree to our collection of information through the use of cookies. To learn more, view our Privacy Policy. [testimonies_for_the_church_volume_3.pdf](#)