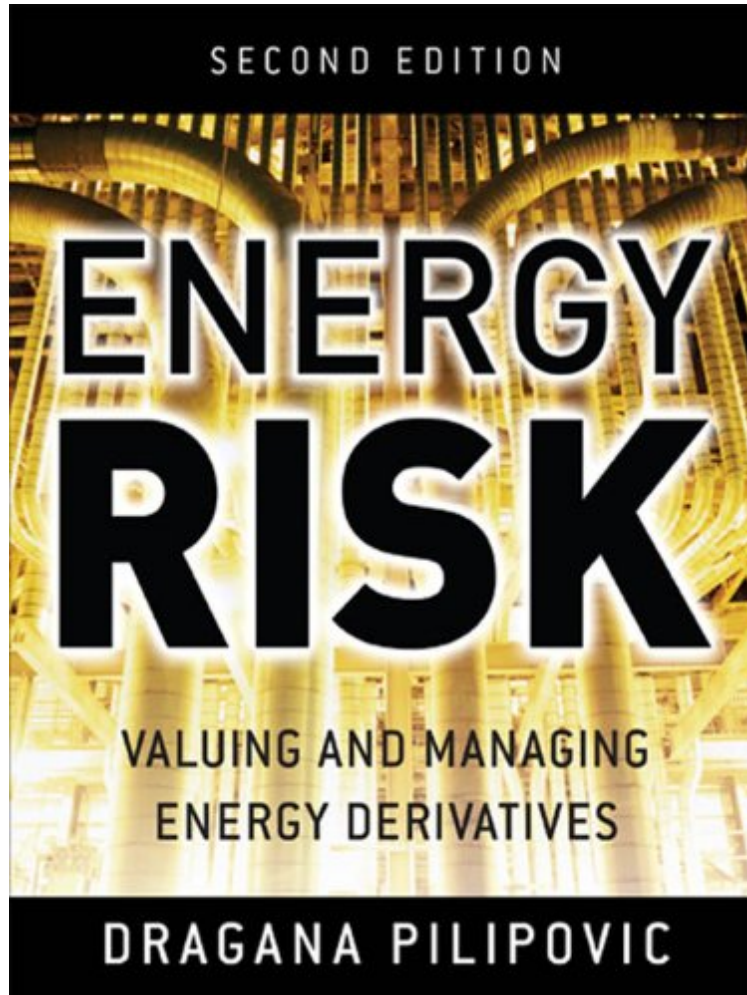


Energy Risk: Valuing and Managing Energy Derivatives

Dragana Pilipovic, Dragana Pilipovic
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Dragana Pilipovic, Dragana Pilipovic : Energy Risk: Valuing and Managing Energy Derivatives before purchasing it in order to gage whether or not it would be worth my time, and all praised Energy Risk: Valuing and Managing Energy Derivatives:

9 of 12 people found the following review helpful. A good general introduction but needs more case studiesBy Dr. Lee D. CarlsonIt is now a tautology to say that energy derivatives are very important financial instruments. Energizing a market of billions of dollars, they are useful to many different organizations and find their place in myriads of both business and personal portfolios. This book is written for those readers who are just entering the field of energy derivatives, but yet who still have a background in other areas of financial engineering. It emphasizes risk minimization, and also gives some of the author's unique perspective on the subject. Only the first six chapters were read by this reviewer and so only these will be reviewed here.The first chapter of the book discusses the general properties of energy derivatives and the concept of risk management. The author distinguishes between `quantitative'

analysis, which emphasizes the construction of models that replicate market behavior, and 'fundamental' analysis, which is an attempt to understand and describe market behavior in terms of the economics of supply and demand. The author emphasizes fundamental analysis in the book. She also outlines what makes energy derivatives unique in their analysis, i.e. what makes them different from interest rate and equity markets in terms of these different analysis categories. Energy markets exhibit stronger mean reversion, she argues, and supply constraints can "shock" the system. These differences motivate the introduction of the topics of 'convenience yield' and seasonality that do not have to be used in other types of markets. Chapter 2 gets into the actual construction of financial models, with the author emphasizing the need for effective benchmarking of these models. She constructs some elementary stochastic price models and introduces some of the basic modeling terminology to be used in the book. One of these concepts is the 'convenience yield' that represents the benefit that a holder of a commodity receives by holding the commodity, and is a measure of the balance between the available supply and the existing demand. Defining the convenience yield is difficult, but dominates the mathematical modeling of the energy markets. The author spends a fair amount of time discussing the mean-reversion process with more to come in later chapters. She also discusses the difference between yield and forward rate curves, a forward curve geared toward short-term interest rates, while a yield curve is a discount rate curve representing average rates from the present to points along the time axis. In chapter 3 the author discusses some of the mathematical/statistical tools involved in energy derivatives, with the analysis of time series and distribution analysis being the two dominant tools that are examined. Time series are used to monitor day-to-day changes in prices, while distribution analysis deals with price levels over extended intervals of time. The material in the chapter is standard, and should be helpful to readers who need a review of it. Chapter 4 is an introduction to the modeling of spot prices, with the assumption that supply and demand effects converge in the spot market prices. Derivative contracts are bought and sold with the belief that this convergence holds. After a quick look at actual time series of spot prices, the author constructs a lognormal price model and two mean-reverting models. Lognormal price models are of course standard constructions in financial engineering, and are popular for their simplicity and for enforcing positive-definiteness. Negative autocorrelation between spot prices are characteristic of energy markets, and is satisfied in mean-reverting models. The author also introduces one of her models, a two-factor model, with the first factor being the spot price, and the second factor a long-term equilibrium price, which when the latter is zero gives a single-factor model for the energy commodity spot price. Time series analysis is used to obtain the model parameters and distribution analysis is used to test the models over extended time periods. The distribution analysis involves Monte Carlo simulation, and the results showing the differences between actual and sample model simulated distributions. Recognizing the importance of forward prices in derivatives pricing and risk management, the author gives a detailed treatment of them in chapter 5. The author points out, interestingly, that there is no correlation between energy futures prices to interest rates in the energy commodity markets. The futures and forward prices are valued in an identical manner in energy markets, and energy future price and forward price can be used interchangeably. She also uses the no-arbitrage market condition to show that spot and forward prices are different, and derives partial differential equations for the forward price, both with and without dividends. Chapter 6 is extremely important, especially for the development of practical trading strategies, for it concerns measures of volatility for price processes. The volatility of the spot price gives information about the degree of randomness in the returns of the spot price over short intervals of time. Traders are of course very interested in volatilities, since the width of the price distribution is related to the probability of the option expiring in-the-money. This is well-known in financial modeling of derivatives, but there are some peculiarities in energy markets, such as "volatility term structure", that make the modeling process more difficult. The author discusses how to calculate historical, market-implied, and model-implied volatilities, and introduces the (two-dimensional) 'discrete volatility matrix', the latter of which is due to the author. Several justifications are given for using a two-dimensional matrix of volatilities rather than a single-volatility term structure. The author does not however give any practical reasons for using this matrix or case studies that would illustrate its advantages. Reference is given to a commercial product that uses it, but it would have been helpful to the reader if the author had given more details on its use in practical everyday trading.

0 of 0 people found the following review helpful. ok but not a reference book By RS Quantitative-oriented type of book but real quants will probably find it a bit "light". The first chapters are supposed to give some background on power, nat gas and oil markets, but there is not much interesting content, which can be summarised like this : "volatility may be very volatile, especially on power, and spot and forward contracts are at best loosely correlated". So nothing really new / interesting unless you are really new to the energy business. That said, the author proposes an interesting commodity model in the following chapter, and some insight on model building and validation. Worth a read, but far from a reference book. I would recommend it for a new manager that wants some quick background / crash course on commodity models, to help in discussions with quants and traders.

0 of 0 people found the following review helpful. Good Update By Bandanna I had the 1997 edition and was hoping there was a new one. Ms. Pilipovic has the practioner's experience and the mathematician's knowledge to provide expert advice on the topic.

The Latest Methods and Strategies for Successfully Trading and Managing Risk in Today's Volatile Energy Markets

The updated Second Edition of Energy Risk presents an authoritative overview of the contemporary energy trading arena, combining the lessons from the last decade with proven methods and strategies required for valuing energy derivatives and managing risk in these ever volatile markets. Written by renowned energy risk expert Dragana Pilipovic this revised classic examines market behavior, covering both quantitative analysis and trader-oriented insights. The book shows how to establish a modeling process that involves the key players—managers, traders, quantitative analysts, and engineers—and provides practical answers to energy trading and risk management questions. The Second Edition of Energy Risk features: Detailed coverage of the primary factors that influence energy risk Techniques for building marked-to-market forward price curves, creating volatility matrices, and valuing complex options Specific guidelines and tools for achieving risk goals New to this edition: three new chapters on the emerging energy market and marked-to-market issues; new material on energy-specific models, seasonal effects, and the derivation of the mean-reverting price model; and more

About the Author Dragana Pilipovic works at AAA Capital Management, a hedge fund in Houston. She was also the founder and president of SAVA Risk Management Corporation, which provided quantitative analysis, risk management, and software development to major companies in the energy industry and energy trading field. Ms. Pilipovic has received a United States patent for a volatility model, has published numerous articles in industry journals and speaks at professional conferences nationwide. She holds a bachelors in physics from Harvard University, a masters in experimental physics from Brown University, and an MBA from the University of Chicago.