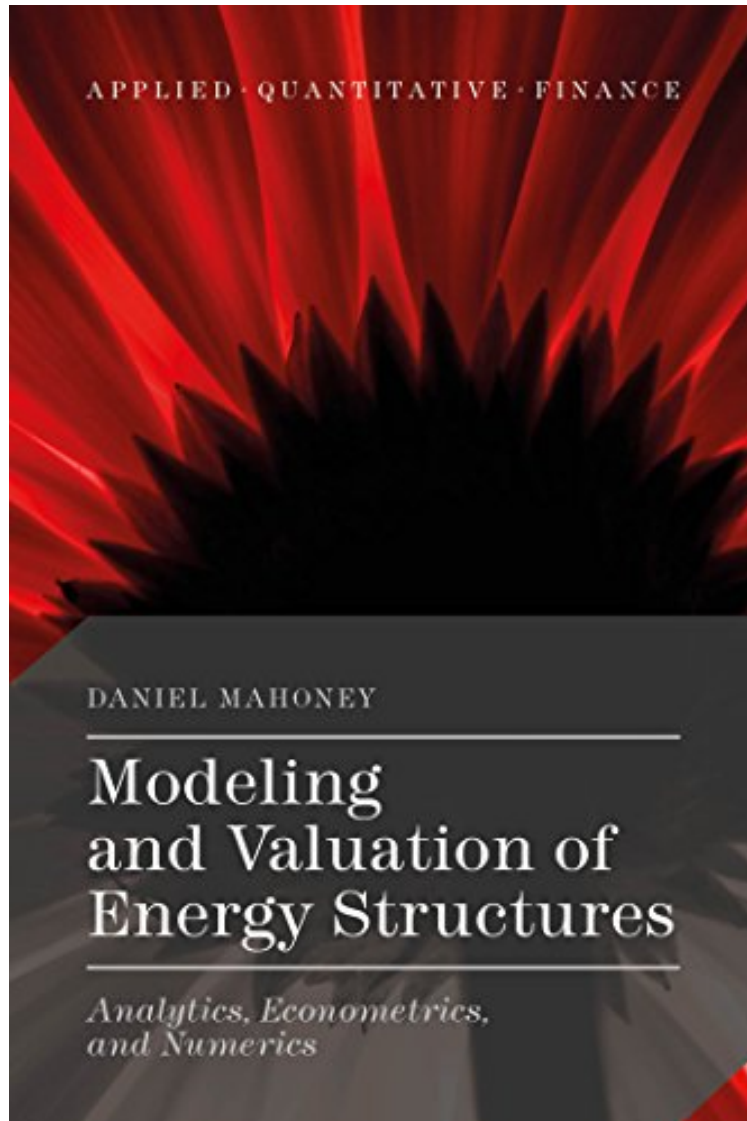


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Modeling and Valuation of Energy Structures: Analytics, Econometrics, and Numerics (Applied Quantitative Finance)

Daniel Mahoney

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Commodity markets present several challenges for quantitative modeling. These include high volatilities, small sample data sets, and physical, operational complexity. In addition, the set of traded products in commodity markets is more limited than in financial or equity markets, making value extraction through trading more difficult. These facts make it very easy for modeling efforts to run into serious problems, as many models are very sensitive to noise and hence can easily fail in practice. *Modeling and Valuation of Energy Structures* is a comprehensive guide to quantitative and statistical approaches that have been successfully employed in support of trading operations, reflecting the author's 17 years of experience as a front-office 'quant'. The major theme of the book is that simpler is usually better, a message that is drawn out through the reality of incomplete markets, small samples, and informational constraints. The necessary mathematical tools for understanding these issues are thoroughly developed, with many techniques (analytical, econometric, and numerical) collected in a single volume for the first time. A particular emphasis is placed on the central role that the underlying market resolution plays in valuation. Examples are provided to illustrate that robust, approximate valuations are to be preferred to overly ambitious attempts at detailed qualitative modeling.

"A very interesting book that offers a concise and rigorous presentation of a wide range of methods analytical, numerical, and econometric and their application to the truly important risk management problems in the energy markets. The book is expertly written, its material remarkably relevant. The book will be beneficial to anyone interested in understanding the use of mathematical methods in the world of commodities." -Alexander Eydeland, Managing Director, Morgan Stanley "Mahoney presents a comprehensive and detailed coverage of techniques used in quantitative analysis of energy markets in a very readable form. This book will prove invaluable to anyone involved in or studying the energy markets." -Jon Fox, Options Trader, Trafigura "An essential read for anybody who wants to better understand the analytical challenges involved in modeling commodities markets and how to approach them. After a brief introduction to market structures and products, the book focuses on real world applications and best analytical and numerical practices for how to value and manage the risk around commodities assets and contracts. Written for the intermediate to advanced reader, the book provides a comprehensive, yet concise overview of mathematical and statistical methods required." -Harald Ullrich, Vice President of Commercial Analytics, Exelon "Rapid changes in energy markets caused by deregulation and innovation have created a challenging environment for consumers and market participants alike. Dr Mahoney's book provides clear instruction on state-of-the-art modeling and risk management approaches for energy products." -Steven B. Perfect, Associate Professor of Finance, Florida State University
About the Author Dan Mahoney has over 17 years of experience as an energy quant in support of trading, structuring, and origination. He has extensive experience in mathematical and financial modeling with an emphasis on the valuation of volatility-related structures. He has held positions at Mirant, FPL, Sempra, Societe Generale, Trafigura, Swiss Re, and Citigroup, where he has been responsible for model development and infrastructure. His background covers a wide range of deals, both physical and financial, including tolling, full requirements, gas storage, and transport. He holds degrees from Caltech and MIT, US.