



September 15, 2014

Derivatives II

Applications in Energy Markets

Course Type	Lectures / Case work
Course Level	Master
ECTS / SWS	6 / 4
When & where	usually 9:45-11:15, Room 0540
Lecturer	Prof. Dr. David Wozabal
Language	English

General Information

The course is a continuation of the course *Derivatives* in the summer semester and gives an introduction to derivatives in energy markets. The goal is to discuss the specific challenges in pricing, hedging, and risk management connected with trading on energy markets. The content includes material on forward and futures trading, specification and estimation of models for price dynamics, pricing of derivative instruments, and risk management techniques.

To facilitate a better understanding of the subject the course is divided into lectures and work on case studies. In the lecture parts theory is presented which will then subsequently be applied in three case studies. Students work on the case studies in groups, hand in short write-ups of their work, and present their results in the class.

Participation & Registration

The course is open to all master students who specialize in *Finance & Accounting* or have *BWL* as a minor studying at TUM. The number of participants is limited to 30 and a registration is required. Registration is done via TUMOnline. Seats are awarded on a *first-come-first-serve* basis.

Prerequisites

Good or excellent knowledge of basic finance (instruments, no-arbitrage pricing, market modelling) as for example acquired through the course *Derivates*. Interest in mathematical modelling, quantitative analysis, and working with data. Proficiency in MATLAB or a similar high level programming language is a plus.

Assessment & Grading

Grades will be awarded based on

1. the reports on the case studies (70%),
2. the paper presentations and participation in class (30%).

Learning Objectives

- Get an overview of the challenges of trading in energy markets.
- Be able to analyze standard pricing, planning, and risk management problems that arise on a energy trading floor.
- Develop solution approaches for selected challenges.

Schedule (Preliminary)

Date	Topic	Reading	Time
08.10.2014	Futures / Forwards on Energy Markets	[2], Chapter 2 & 3	8:00–11:15
15.10.2014	Paper 1 (Group Work)		
22.10.2014	Paper 1 (Group Work)		
29.10.2014	Paper 1 (Presentation)		9:45–11:15
05.11.2014	Dynamics of the Futures Curve I	[1], Chapter 8	9:45–11:15
19.11.2014	Dynamics of the Futures Curve II		9:45–11:15
26.11.2014	Paper 2 (Group Work)		
03.12.2014	Paper 2 (Group Work)		
10.12.2014	Paper 2 (Presentation)		9:45–11:15
17.12.2014	Risk Management I	[1], Chapter 9 & 10	9:45–11:15
07.01.2015	Risk Management II		9:45–11:15
14.01.2015	Paper 3 (Group Work)		
21.01.2015	Paper 3 (Group Work)		
28.01.2015	Paper 3 (Presentation)		9:45–11:15

Literature

- [1] L. Clewlow and C. Strickland. *Energy Derivatives: Pricing and Risk Management*. Lacima Publications, 2000.
- [2] H. Geman. *Commodities and Commodity Derivatives: Modeling and Pricing for Agriculturals, Metals and Energy*. The Wiley Finance Series. Wiley, 2009.

- [3] J. Hull. *Options, Futures, and Other Derivatives*. Prentice Hall, 2012.
- [4] S. Shreve. *Stochastic Calculus for Finance II: Continuous-Time Models*. Springer Finance / Springer Finance Textbooks. Springer New York, 2010.
- [5] S. Shreve. *Stochastic Calculus for Finance I: The Binomial Asset Pricing Model*. Springer Finance. Springer, 2012.