



AALBORG UNIVERSITET

Ph.d.-forelæsning/PhD Defense

Som led i betingelserne for opnåelse af ph.d.-graden ved Aalborg Universitet, Det Ingeniør- og Naturvidenskabelige Fakultet, holder Thomas Hvolby, Institut for Matematiske Fag, en forelæsning med efterfølgende forsvar af ph.d.-afhandlingen

Essays on Risk and Fair Pricing

Hvornår/When?

Fredag den 2. marts 2018 kl. 13:00

Friday, March 2, 2018, at 13:00

Hvor/Where?

Aalborg Universitet

Skjernvej 4A, lokale/room 5.034

Tilmelding/Registration

Tilmelding skal ske senest den 26. februar 2018 til merete@math.aau.dk, såfremt du deltager i receptionen.

Deadline February 26 to merete@math.aau.dk for registration to the reception.

Efter forelæsningen er Institut for Matematiske Fag vært ved en reception, der foregår i kaffestuen (lokale 5.123) på Skjernvej 4A.

After the department will host at small reception at Skjernvej 4A in room 5.123.

På Gensyn til en festlig eftermiddag

Med venlig hilsen

Institut for Matematiske Fag

Department of Mathematical Sciences

Essays on Risk and Fair Pricing

By Thomas Hvolby

The thesis is concerned with valuation of price adjustments due to different types of risks in financial markets.

First, we examine the correlation structure between wind power production and electricity prices as observed on the Danish power market. The observed correlation structure is non-linear and model this structure using different representations of constant and time-varying copulas. We apply the models that give the best fit to estimate the volumetric risk premium for contracts with payoffs sensitive to the joint behavior of our two variables.

Second, we consider estimation of credit value adjustments (CVA), which are risk-premia connected to counterparty credit risk. We consider CVA estimation on options under presence of wrong way risk (WWR), where the option value is negatively correlated with a counterparty's probability of default. Here we consider a recently established change-of-measure approach that yields simple approximations of the CVA, and from a numerical study, we find this to be superior to the Basel III framework at capturing the WWR-effect on CVA.

Further, we consider credit default swaps (CDSs), which are insurance contracts against default of a financial entity. We use market quotes on CDSs to calibrate stochastic jump models; specifically we consider a Cox-process driven by a CIR-model. We present numerical results on the market price of risk on CDS markets and supply a framework for using the obtained models to estimate CVA on CDS contracts in the presence of bilateral CVA (BCVA), where the counterparties trading the CDS are exposed to each other's credit riskiness.

Bedømmelsesudvalg/Assessment committee:

Lektor Ege Rubak, Aalborg Universitet
Professor Rolf Poulsen, Københavns Universitet
Professor Wolfgang Runggaldier, University of Padova

Ordstyrer/Moderator:

Professor Rasmus Waagepetersen

Vejledere/Supervisors:

Lektor Esben Høg, Aalborg Universitet
Bent Jesper Christensen, Aarhus Universitet