# Seminar Quantitative Methods

## Group 1: Banking & Finance (173350)

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## Seminar Topics

### Overview of seminar topics (Supervisor)

- 1) Applications of the EM algorithm in Finance (Dr. Claussen)
- 2) Financial Contagion and the real economy (Dr. Claussen)
- 3) The information content of the risk neutral distribution - An empirical analysis (Prof. Dr. Dierkes)

> Note: Depending on number of seminar participants the thesis can be written in a two-person team.

# Seminar Topics

## 1) Applications of the EM algorithm in Finance (Dr. Claussen)

- Objectives of this topic:
  - Detailed description of the Expectation-maximization (EM) algorithm.
  - Concise literature review of applications in finance.
  - Precise analysis and reverse engineering of a selected published article or application on self-selected economic questions.

- Literature:
  - Basis literature: Dempster, A.P.; Laird, N.M. and Rubin, D.B. (1977). *Maximum Likelihood from Incomplete Data via the EM Algorithm*. Journal of the Royal Statistical Society, Series B. 39 (1), 1–38.
  - Application: Gouriéroux, C., Monfort, A., 1996. *Simulation-Based Econometric Methods.* Oxford University Press, New York.
  - Application: McNeil, Alexander J., and Jonathan P. Wendin. *Bayesian inference for generalized linear mixed models of portfolio credit risk.* Journal of Empirical Finance 14.2 (2007): 131–149.

# Seminar Topics

## 2) Financial Contagion and the real economy (Dr. Claussen)

- Objectives of this topic:
  - Concise literature review of financial contagion, analysis of different definitions and resulting literature branches.
  - Precise analysis and reverse engineering of a selected published article. Alternatively following one definition of contagion and empirical identification with self-selected economic data.

- Literature:
  - Forbes, Kristin J., and Roberto Rigobon. *No contagion, only interdependence: measuring stock market comovements.* The journal of Finance 57.5 (2002): 2223-2261.
  - Rodriguez, Juan Carlos. *Measuring financial contagion: A copula approach.* Journal of empirical finance 14.3 (2007): 401–423.
  - Baur, Dirk G. *Financial contagion and the real economy.* Journal of Banking & Finance 36.10 (2012): 2680–2692.

# Seminar Topics

## 3) The information content of the risk neutral distribution (Prof. Dr. Dierkes)

- Objectives of this topic:
  - Please give a broad literature overview of the information that option prices can reveal. Examples include short sales constraints, aggregate risk aversion, and moments of the risk neutral distribution.
  - Then, please focus on one topic related to the risk neutral distribution and provide an empirical analysis based on option data.

- Literature:

  - Bakshi, G., N. Kapadia, and D. Madan (2003): *Stock Return Characteristics, Skew Laws, and the Differential Pricing of Individual Equity Options*. Review of Financial Studies 16, 101–143.
  - Cremers, M., Weinbaum, D. (2010): *Deviations from Put-Call Parity and Stock Return Predictability*. Journal of Financial and Quantitative Analysis 45, 335–367.
  - Elliot, G. (2013): *Handbook of Economic Forecasting*, Volume 2A, North-Holland.
  - Grundy, B.D., Lim, B., and Verwijmeren, P. (2012): *Do option markets undo restrictions on short sales? Evidence from the 2008 short-sale ban*. Journal of Financial Economics 106, 331–348.
  - Jackwerth, J. (2000): *Recovering Risk Aversion from Option Prices and Realized Returns*. Review of Financial Studies 13, 433–451.