1MT555 International Week:
Quantitative Finance

Course theme:
Quantitative Finance

Guest lecturer:
RNDr. Ing. Peter Molnár, Ph.D. *(University of Stavanger, Norway)*

Course aim:
Obtaining a broad knowledge about: simple and multiple linear regression, Capital Asset Pricing model, Fama-French 3-factor model, distribution of stock returns, modelling volatility and correlation, utilization of dummy (indicator) variables: seasonality and other applications, principal component analysis, copula, quantile regression: Value at Risk model

Teaching form:
Lecture and seminar

COURSE CONTENT:

Part 1: ASSET PRICING MODELS
1) Brief introduction to financial assets and how securities are traded
2) Return, risk, and the risk-return tradeoff
3) Capital asset pricing model, systematic versus idiosyncratic risk
4) Fama-French 3-factor model
5) Carhart 4-factor model
4) Brief introduction to other multifactor models

Part 2: VOLATILITY MODELLING
1) Distribution of stock returns
2) Autocorrelation in returns, and autocorrelation in squared returns
3) GARCH volatility models
4) Highest and lowest price of the day and how it improves volatility models
5) Realized volatility

Part 3: BRIEF INTRODUCTION TO RISK MANAGEMENT
1) Value at Risk
2) Quantila regression and its application in Value at Risk

Part 4: INTERESTING TOPICS AND DATA SOURCES (FOR EXAMPLE FOR A MASTER THESIS IN FINANCE)
1) Realized volatility (introduced previously)
2) Economic policy uncertainty
3) Google trends
4) Cryptocurrencies

RNDr. Ing. PETER MOLNÁR, Ph.D.
University of Stavanger, Norway

PROFESSIONAL CAREER:
- since 2016 University of Stavanger, Stavanger, Norway (Associate Professor)
- in 2011–2016 Norwegian University of Science and Technology, Trondheim, Norway (Postdoc)
- in 2006–2011 Norwegian School of Economics, Bergen, Norway (research scholar)

RESEARCH INTERESTS:
Economics and finance in general, volatility, risk management, corporate finance, behavioral finance, energy markets, energy economics, commodities, cryptocurrencies

MAJOR PUBLICATIONS:

- HORPESTAD, Jone B., LYÓCSA, Štefan, MOLNÁR, Peter, OLSEN, Torbjorn B. Asymmetric volatility in equity markets around the world. The North American Journal of Economics and Finance. 2019, p. 540–554. ISSN 1062-9408. DOI: 10.1016/j.najef.2018.07.011.
- BOE, Kristine S., JORDAL, Therese, MIKULA, Štěpán, MOLNÁR, Peter. Do political risks harm development of oil fields? Journal of Economic Behavior & Organization. 2019, p. 338–358. ISSN 0167-2681. DOI: 10.1016/j.jebo.2018.01.005.
- KIM, Neri, LUČIVJANSKÁ, Katarína, MOLNÁR, Peter, VILLA, Roviel. Google searches and stock market activity: Evidence from Norway. Finance Research Letters. 2019, p. 208–220. ISSN 1544-6123. DOI: 10.1016/j.frl.2018.05.003.
- LYÓCSA, Štefan, MOLNÁR, Peter, PLÍHAL, Tomáš. Central bank announcements and realized volatility of stock markets in G7 countries. Journal of International Financial Markets, Institutions and Money. 2019, p. 117–135. ISSN 1042-4431. DOI: 10.1016/j.intfin.2018.09.010.
- BAŠTA, Milan, MOLNÁR, Peter. Long-term dynamics of the VIX index and its tradable counterpart VXX. Journal of Futures Markets. 2019, no. 3, p. 322–341. eISSN 1096-9934. ISSN 0270-7314. DOI: 10.1002/fut.21974.
- THIES, Sven, MOLNÁR, Peter. Bayesian change point analysis of Bitcoin returns. Finance Research Letters. 2018, p. 223–227. ISSN 1544-6123. DOI: 10.1016/j.frl.2018.03.018.
- BAŠTA, Milan, MOLNÁR, Peter. Oil market volatility and stock market volatility. Finance Research Letters. 2018, p. 204–214. ISSN 1544-6123. DOI: 10.1016/j.frl.2018.02.001.
- GAUGOM, Erik, HOFF, Guttorm, MOLNÁR, Peter, MORTENSEN, Maria, WESTGAARD, Sjur. The Forward Premium in the Nord Pool Power Market. Emerging Markets Finance and Trade. 2018, no. 8, s. 1793–1807. eISSN 1558-0938. ISSN 1540-496X. DOI: 10.1080/1540496X.2018.1441021.
- MOLNÁR, Peter, BERNTSEN, Martin, BOE, Kristine Skjong, JORDAL, Therese. Determinants of oil and gas investments on the Norwegian Continental Shelf. Energy. 2018, p. 904–914. ISSN 0360-5442. DOI: 10.1016/j.energy.2018.01.147.