FELIX BRUNNER

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Nova School of Business and Economics
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RESEARCH INTERESTS

Financial Econometrics, Macroeconometrics, Forecasting, Machine Learning, Data Science

EDUCATION

Nova School of Business and Economics 09/2016 - Present
Ph.D. in Economics/Finance *Lisbon, Portugal*

- Completed course curriculum with concluding exams at the end of the first two years
- Conducted research in applied time series econometrics, networks, statistical learning, asset pricing, empirical finance
- PhD thesis: *Connecting the dots: An exploration of spillover networks in economics and finance*
- Supervisor: Paulo M.M. Rodrigues
- Expected graduation in 2023

Universitiy of North Carolina 01/2018 - 05/2018
Visiting Scholar *Chapel Hill, USA*

- Participated in advanced coursework and seminars in finance
- Advanced own research ideas

Nova School of Business and Economics 09/2014 - 05/2016
M.Sc. in Finance *Lisbon, Portugal*

- Majored in Financial Markets
- Master's project: *Is there a low-risk return premium in commodity markets?*

Vienna University of Economics and Business 10/2010 - 05/2014
B.Sc. in International Business Administration *Vienna, Austria*

- Majored in Finance, Corporate Governance and Controlling
- Bachelor project: *Debt structure in the U.S. information technology sector*

National University of Singapore 01/2013 - 05/2013
Exchange Student *Singapore, Singapore*

- Took courses in international finance

RESEARCH PROJECTS

Echo-nomics: Does the stock market resonate with granular innovations? 2023
with Ruben Hipp *Draft version*

Abstract: This paper investigates the interplay between asset-level innovations and aggregate market variation through the lens of a directed spillover network. Utilizing high-dimensional samples with daily data of 100 US stocks, we probe the "granular hypothesis" in a network setting and explore two key aspects. First, we establish the presence and dynamics of a directed spillover network in asset markets, demonstrating the potential for granular innovations to propagate in the cross-section of stocks. We

find that spillover intensity and assets' relative importance are fast-changing and usually short-lived. Second, we test whether such a spillover network, combined with a concentrated size distribution, enable granular shocks to significantly influence aggregate market outcomes. The results indicate a positive significant effect from micro innovations to the aggregate market index. Thus, both findings bring into focus a potential missing link in financial market models — the inter-asset spillover network — which helps to connect micro-economic narratives to macro-financial outcomes.

Granular risk premia 2023

\- *Draft version*

Abstract: In a network connectedness model of US equity prices, granular innovations at the firm level can have systemic effects for two reasons: Index weights are too concentrated for diversification arguments to apply, and spillovers propagate non-systematic innovations to a large portion of investor wealth. In this study, I introduce a pricing kernel that includes structural connections and show theoretically that inter-asset connectedness has implications for expected returns. I empirically investigate various conjectures to validate this framework and its quantitative relevance by using estimated spillover networks of 100 US equities. My results imply that risk premia for firm-level innovations exist temporarily and relate to mean returns in the cross-section of stocks. I collect evidence that such granular risk premia could be an overlooked determinant of asset prices, consistent with the continuous emergence of anomalies relative to reduced-form factor pricing models.

Dynamic Density Forecasting with Hidden Markov Models 2021

\- *Work in progress*

Abstract: I demonstrate how dynamic probability densities can be obtained from the encompassing class of Hidden Markov Models. Density forecasts under such models cover a wide range of shapes that dynamically evolve as mixture distributions. The general model class can nest various sub-processes that produce flexible dynamics of the overall model. I benchmark the capabilities of various models to estimate data generating distributions in-sample and out-of-sample in a simulation study. Finally, I apply the model to real-world financial and economic data.

The Expected Distribution of Return, Ambiguity, and Asset Prices 2019

with Fernando Anjos and Martijn Boons *Discontinued*

The Tangency Portfolio of Commodity Futures 2018

with Martijn Boons *Discontinued*

PUBLICATIONS

Estimating large-dimensional connectedness tables: The Great Moderation through the lens of sectoral spillovers 2023

with Ruben Hipp *Quantitative Economics*

Abstract: We estimate sectoral spillovers around the Great Moderation with the help of forecast error variance decomposition tables. Obtaining such tables in high dimensions is challenging because they are functions of the estimated vector autoregressive coefficients and the residual covariance matrix. In a simulation study, we compare various regularization methods on both and conduct a comprehensive analysis of their performance. We show that standard estimators of large connectedness tables lead to biased results and high estimation uncertainty, both of which are mitigated by regularization. To explore possible causes for the Great Moderation, we apply a cross-validated estimator on sectoral spillovers of industrial production in the US from 1972 to 2019. We find that the spillover network has considerably weakened, which hints at structural change, for example, through improved inventory management, as a critical explanation for the Great Moderation.

AWARDS & SCHOLARSHIPS

- PhD Fellowship of the Fundação para a Ciência e a Tecnologia — 2016, 2017, 2018, 2019
- WU Vienna Top League honours programme for high potentials — 2011, 2012, 2013
- Scholarship for special performance in studies and examinations — 2011, 2012
- High School's Award in Economics — 2009

TEACHING EXPERIENCE

- Investments, Grader — 2019, 2020, 2021
- Corporate Finance, Grader — 2017, 2018, 2019
- Data Analysis for Finance, Teaching Assistant — 2021
- Financial Management, Teaching Assistant — 2018

PROFESSIONAL EXPERIENCE

dida Machine Learning — 05/2021 - 09/2023
Machine Learning Scientist — *Berlin, Germany*

· Conducted funded research projects with deep-learning applications to computer vision and time series
· Developed commercial machine learning software for error detection and machine surveillance in a manufacturing context
· Planned and implemented end-to-end data processing pipelines for the deployment of deep-learning solutions into live production
· Represented and organized a five-person project team in collaboration with external partners
· Conceptualized natural language processing solutions with large language models for semantic search and question answering based on internal documents

Universidade Nova de Lisboa — 09/2017 - 02/2022
Teaching Assistant — *Lisbon, Portugal*

· Supported teaching and grading of Master's level courses
· Provided student exercises and supervised exams
· Prepared teaching materials and held student workshops in financial modeling

risklab (Allianz Global Investors) — 07/2015 - 11/2015
Investment & Risk Strategies Intern — *Munich, Germany*

· Conducted independent research on fund performance, multi-factor models, and portfolio optimization
· Implemented prototype tools for investment and risk strategies in MatLab and VBA for Excel

zeb — 03/2014 - 08/2014
Risk Management Consulting Intern — *Vienna, Austria*

· Carried out project budgeting and scenario analysis
· Supportet project controlling and project management
· Analyzed regulatory requirements and audit findings
· Prepared senior management presentations

Gaotime Information — 08/2013 - 09/2013
Financial Markets Intern — *Shanghai, China*

· Developed a finance newsletter and prepared its contents on a daily basis

· Conducted financial analysis of companies and industries
· Prepared research reports and presentations

Arbeiterwohlfahrt Ortsverein Emmendingen, AWO 08/2009 - 04/2010
Civil Servant *Emmendingen, Germany*

Turnerbund Emmendingen, Deutscher Basketball Bund DBB 09/2004 - 07/2010
Basketball Coach & Referee *Emmendingen, Germany*

SKILLS

Coding	Python, MatLab, SQL, R, VBA
Libraries	numpy, scipy, pandas, matplotlib, scikit-learn, PyTorch, transformers, statsmodels
Tools	LaTeX, MS Office, git
Languages	English (professional), German (native), Portuguese (intermediary), French (basic)

ACTIVITIES & INTERESTS

- Time best spent is with my dear family & friends, and foremost, my son Frederik
- I am an amateur athlete in various sports, with experience as basketball coach and referee
- Topics I follow include professional basketball and the latest developments in artificial intelligence
- I enjoy the excitement of exploring strange new places whenever possible
- Lisbon Data Science Academy 2020