Tobias Hartl

Contact

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Research Interests

Econometrics, State Space Models, Factor Models, Long Memory

Education

Ph.D. in Economics, University of Regensburg — 2023
Supervision: Prof. Rolf Tschernig and Prof. Uwe Hassler
Expected to be completed in May 2023

M.Sc. in Economics, University of Regensburg — 2017
Final Grade: 1.03 (on a scale of 1-5, where 1 is the best grade)

B.Sc. in Economics, University of Regensburg — 2015
Final Grade: 1.81 (on a scale of 1-5, where 1 is the best grade)

Professional Experience

Visiting Researcher, Princeton University, Economics Dept. — 2023 - 2024
Scheduled 09/2023 - 02/2024

Research Associate, University of Regensburg, Economics Dept. (75%) — since 2017

Research Associate, Institute for Employment Research (IAB) Nuremberg (25%) — since 2017

Student Assistant, University of Regensburg, Economics Dept. — 2016 - 2017

Research Intern, Institute for Employment Research (IAB), Nuremberg — 2016

Job Market Paper

The fractional unobserved components model: a generalization of trend-cycle decompositions to data of unknown persistence
I introduce a flexible structural model for the decomposition of time series into trend and cycle. It formulates the trend component as a fractionally integrated process of order $d \in \mathbb{R}_+$, thus encompassing the bulk of the literature on trend-cycle decompositions, e.g. the HP filter or unobserved components models. At the same time, the model allows for richer long-run dynamics via non-integer d and thus for intermediate solutions between $I(1)$ and $I(2)$ trend specifications. I derive the closed-form solutions to the estimation of trend and cycle, as well as the full asymptotic theory for parameter estimation. To applied researchers, my model offers a robust, flexible and data-driven way of decomposing time series, that requires neither assumptions about the integration order nor the choice of some tuning parameter. An application to US annual CO2 emissions reveals that cyclical emissions are coupled to the business cycle, while trend emissions are smooth and begin to exhibit an inverted U-shape.

Peer-Reviewed Publications

Hartl, T. and Jucknewitz, R. (2022b). Multivariate fractional components analysis. *Journal of Financial Econometrics*, (forthcoming). `https://doi.org/10.1093/jjfinec/nbab022`

Hartl, T. and Jucknewitz, R. (2022a). Approximate state space modelling of unobserved fractional components. *Econometric Reviews*, 41(1):75–98. `https://www.tandfonline.com/doi/full/10.1080/07474938.2020.1841444`

Working Papers

Hartl, T. (2022). The fractional unobserved components model: a generalization of trend-cycle decompositions to data of unknown persistence. Working paper

Hartl, T., Hutter, C., and Weber, E. (2021). Matching for three: big data evidence on search activity of workers, firms, and employment service. Working paper. `http://doku.iab.de/discussionpapers/2021/dp0121.pdf`

Hartl, T., Tschernig, R., and Weber, E. (2020b). Fractional trends in unobserved components models. Working paper. `https://arxiv.org/abs/2005.03988`

Hartl, T., Tschernig, R., and Weber, E. (2020c). Solving the unobserved components puzzle: A fractional approach to measuring the business cycle. Working paper

Hartl, T. (2020). Macroeconomic forecasting with fractional factor models. Working paper. `https://arxiv.org/abs/2005.04897`

Work in Progress

Ammon, D., Hartl, T., and Tschernig, R. (2022). Determining the number of factors in fractionally integrated factor models.

Haimerl, P. and Hartl, T. (2022). Modeling the COVID-19 infection rates by regime-switching unobserved components models.

Hartl, T., Tschernig, R., and Weber, E. (2022). Multivariate fractional unobserved components and the cyclicality of labor market flows.

Selected Further Publications

Bauer, A., Hartl, T., Hutter, C., and Weber, E. (2021). Search processes on the labor market during the covid-19 pandemic. *CESifo forum*, 22(4):15–19

Donsimoni, J. R., Glawion, R., Hartl, T., Plachter, B., Timmer, J., Wälde, K., Weber, E., and Weiser, C. (2020). Covid-19 in Deutschland - Erklärung, Prognose und Einfluss gesundheitspolitischer Maßnahmen. *Perspektiven der Wirtschaftspolitik*, 21(3):250–262

Hartl, T., Wälde, K., and Weber, E. (2020d). Measuring the impact of the German public shutdown on the spread of COVID-19. *Covid Economics*, 1:25–32

Hartl, T., Wälde, K., and Weber, E. (2020e). Measuring the impact of the German public shutdown on the spread of COVID-19. *VoxEU.org*, 2020-04-14. `https://voxeu.org/article/measuring-impact-german-public-shutdown-spread-covid-19`

Hartl, T., Hutter, C., and Weber, E. (2020a). Neueinstellungen in der Krise. *Makronom.de*, 2020-06-18

Awards and Scholarships

Alumnus of the Lindau Nobel Laureate Meeting 2020

Award for Best Master's Thesis, Economics Dept., University of Regensburg 2017

Award for Best Master's Degree, Economics Dept., University of Regensburg 2017

Student Scholarship, Friedrich-Ebert-Stiftung 2013 - 2017

Third-party Funded Project

Research Grant, German Research Foundation (DFG) 2021 - 2024

Co-authored the proposal for project "Multivariate fraktionale unbeobachtete Komponenten- und Faktormodelle für die makroökonomische Analyse und Prognose" (234,000 EUR; Applicants: Prof. Rolf Tschernig and Prof. Enzo Weber)

Presentations at Conferences

Symposium of the Society for Nonlinear Dynamics and Econometrics (virtual) 2022
Department Seminar (University of Regensburg)
Workshop on High-dimensional Time Series in Macroeconomics and Finance (IHS Vienna)
Annual Meeting of the German Economic Society (University of Basel)
Annual Meeting of the German Statistical Society (University of Münster)
Int. Conference on Computational and Methodological Statistics (King's College London, invited)

Seminar on Long Memory Econometrics (virtual, invited) 2021
Department Seminar (University of Regensburg)
European Summer Meeting of the Econometric Society (virtual)
Annual Meeting of the German Statistical Society (virtual)
Annual Meeting of the German Economic Society (virtual)
Int. Conference on Computational and Methodological Statistics (virtual)

World Congress of the Econometric Society (virtual) 2020
Symposium of the Society for Nonlinear Dynamics and Econometrics (virtual)
Department Seminar (University of Regensburg)
PhD Seminar (University of Regensburg)
Int. Conference on Computational and Methodological Statistics (virtual)

Department Seminar on Statistics and Econometrics (Kiel University, invited) 2019
Econometric Seminar (IAB Nuremberg)
Joint Statistical Meeting of the German Statistical Society (LMU Munich)
Workshop on High-dimensional Time Series in Macroeconomics and Finance (IHS Vienna)
Annual Meeting of the German Statistical Society (Trier University)
Annual Meeting of the German Economic Society (Leipzig University)
Int. Conference on Computational and Methodological Statistics (University of London)

Long Memory Conference (Aalborg University) 2018
Workshop on Statistics and Econometrics (University of Passau)
European Summer Meeting of the Econometric Society (University of Cologne)
Annual Meeting of the German Statistical Society (JKU Linz)
Int. Conference on Computational and Methodological Statistics (University of Pisa)

Refereeing Journals

Advances in Statistical Analysis, International Journal of Forecasting (3), Journal of Business & Economic Statistics, Journal of Labour Market Research, World Development

Teaching Experience

Quantitative Economic Research II (Lecture), University of Regensburg — Summer 2022, Summer 2021

Graduate lecture (6 ECTS). The course covers advanced time series models, their identification, specification, and estimation. Topics covered are simultaneous equation models, (structural) vector autoregression and (structural) vector error correction models.
Average student evaluation (on a scale of 1-6; 1=best): **1.6** (2022); **1.2** (2021)

Programming in R (Lecture), University of Regensburg — Winter 2021

Graduate lecture (2 ECTS). The course gives an introduction into the programming language R. It covers data analysis and manipulation, flow control, regression, simulation, numerical optimization, bootstrap and efficient programming.
Average student evaluation (on a scale of 1-6; 1=best): **1.3**

Advanced Econometrics (Lecture), University of Regensburg — Summer 2020

Graduate lecture (6 ECTS). The course details advanced estimation techniques and analyzes their asymptotic properties. Topics covered are the nonlinear regression model, maximum likelihood estimation, generalized least squares, generalized instrumental variables, and the generalized method of moments.
Average student evaluation (on a scale of 1-6; 1=best): **1.3**

Advanced Dynamic Econometrics (Lecture), University of Regensburg — Winter 2019

Graduate lecture (2 ECTS). The interactive course captures state space models and related topics such as filtering, smoothing, and parameter estimation.
Average student evaluation: **not evaluated**

Advanced Econometrics (Tutorial), University of Regensburg — Summer 2021

Graduate tutorial (6 ECTS). See above for the description.
Average student evaluation (on a scale of 1-6; 1=best): **1.0**

Advanced Issues in Econometrics (Tutorial), University of Regensburg — Winter 2020

Undergraduate tutorial (6 ECTS). The course focuses on panel data and limited dependent variables. It covers causality and evaluation studies, pooled cross section analysis, fixed- and random-effects estimators, instrumental variables and two stage least squares, simultaneous equation models, Logit and Probit models, and models for sample selection corrections.
Average student evaluation (on a scale of 1-6; 1=best): **1.1**

Support in Supervision, University of Regensburg

Master's thesis supervision (5); Bachelor's thesis supervision (2)

Language and Computer Skills

Computer Skills: R, Matlab, Python, Stata, EViews, Gauss, LaTeX
Languages: German (native), English (fluent), French (conversational)