Keyan Liu

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EDUCATION

University of Helsinki, Finland   Expected May 2025
Ph.D. in Economics
Supervisors: Jani Luoto(main), Mika Meitz, Markku Lanne

University of leicester, UK   2018
M.A. in Financial Economics

Nanjing University, China   2016
B.A. in Statistics

FIELDS OF INTEREST

Econometrics, Macroeconometrics, Financial Econometrics

WORKING PAPERS

- **"Non-Gaussian Structural Vector Autoregression with Unknown Break Points"**
  October 2024. Job Market Paper.
- **"Identifying Structural Vector Autoregressions via Non-Gaussianity of Potentially Dependent Structural Shocks"** (with Markku Lanne and Jani Luoto)
  Revise & Resubmit at Journal of Business & Economic Statistics

PUBLICATIONS

- **"Identifying Structural Vector Autoregression via Leptokurtic Economic Shocks"** (with Markku Lanne and Jani Luoto) Journal of Business & Economic Statistics, 2023

WORK IN PROGRESS

- **"Inference for Weakly identified Non-Gaussian Structural Vector Autoregression"** (with Jani Luoto)

PRESENTATIONS

- Econometrics Workshop, December 2023, Helsinki, Finland
- Econometrics Workshop, June 2023, Helsinki, Finland
- Nordic Econometric Meeting, September 2022, Sønderborg, Denmark

- Econometrics Workshop, June 2022, Helsinki, Finland
- Econometrics Seminar, Novermber 2019, Cologne, Germany
- Energy Finance Workshop, April 2019, Stolberg, Germany
- Haindorf Seminar, January 2019, Hejnice, Czech Republic

FELLOWSHIPS AND AWARDS

- Salaried position for Doctoral Researcher, University of Helsinki, 2021-2025
- Travel grant, University of Helsinki, 2022
- College of Social Science Postgraduate Scholarship Program, University of Leicester, 2016
- First Prize of Chinese Chemical Society National Chemistry Contest for High School Students, Chinese Chemical Society National, 2011

TEACHING EXPERIENCE

- Lecturer, Econometrics 1 (MA) University of Helsinki, Fall 2024
- Teaching Assistant, Advanced Econometrics 1 (MA&PhD) University of Helsinki, Fall 2021, Fall 2022, Fall 2023
- Teaching Assistant, Advanced Econometrics 2 (MA&PhD) University of Helsinki, Fall 2021, Fall 2022, Fall 2023
- Teaching Assistant, Advanced Econometrics 3 (PhD) University of Helsinki, Spring 2022

LANGUAGES

Mandarin Chinese (native), English (fluent)

COMPUTER SKILLS

R, MATLAB, LaTeX

REFERENCES

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Non-Gaussian Structural Vector Autoregression with Unknown Break Points

(Job Market Paper)

In this paper, I consider testing and estimating non-Gaussian Structural Vector Autoregressive models with unknown break points (SVAR-BP). This model extends traditional SVAR analysis by allowing for unknown breakpoints, capturing potential changes in both autoregressive coefficients and structural parameters. I employ the Partial Sample Generalized Method of Moments (PSGMM) to estimate the model and utilize the sup-Wald test to assess parameter stability. Additionally, I establish the asymptotic properties of the break point estimators and propose a sequential procedure for detecting and estimating multiple break points. My method is applied to a U.S. macroeconomic dataset from 1954 to 2023, where I identify significant structural breaks corresponding to key economic events. The results demonstrate the ability of our approach to detect and estimate multiple break points, modeling shifts in the dynamics of economic variables driven by external shocks.

Identifying Structural Vector Autoregressions via Non-Gaussianity of Potentially Dependent Structural Shocks

(with Markku Lanne and Jani Luoto)

We show that all shocks in an n-dimensional structural vector autoregression (SVAR) are globally identified up to their order and signs if they are orthogonal and either (i) have zero co-skewness and at most one of them is not skewed or (ii) exhibit no excess co-kurtosis and at least $n-1$ of them are leptokurtic. The former case covers SVAR models with errors following dependent volatility processes. Moreover, if the numbers of both skewed and leptokurtic shocks are smaller than $n-1$, the skewed and leptokurtic shocks are globally identified, while the remaining shocks are set identified. To capture the non-Gaussian features of the data, versatile error distributions are needed. We discuss the Bayesian implementation of an SVAR-GARCH model with skewed t-distributed errors, including the assessment of the strength of identification and checking the validity of exogenous instruments potentially used for identification. The methods are illustrated in an empirical application to the oil market.

Identifying Structural Vector Autoregression via Leptokurtic Economic Shocks

(with Markku Lanne and Jani Luoto)

We revisit the generalized method of moments (GMM) estimation of the non-Gaussian structural vector autoregressive (SVAR) model. It is shown that in the n-dimensional SVAR model, global and local identification of the contemporaneous impact matrix is achieved with as few as $n^2 + n(n-1)/2$ suitably selected moment conditions, when at least $n-1$ of the structural errors are all leptokurtic (or platykurtic). We also relax the potentially problematic assumption of mutually independent structural errors in part of the previous literature to the requirement that the errors be mutually uncorrelated. Moreover, we assume the error term to be only serially uncorrelated, not independent in time, which allows for univariate conditional heteroskedasticity in its components. A small simulation experiment highlights the good properties of the estimator and the proposed moment selection procedure. The use of the methods is illustrated by means of an empirical application to the effect of a tax increase on U.S. gasoline consumption and carbon dioxide emissions.