Han Zhang

Contact Information

Room S0.68
Department of Economics
The Social Science Building
University of Warwick
Coventry, UK
CV4 7AL

Phone: 024 761 50137
Email: Han.Zhang.5@warwick.ac.uk
Email: hzhangu@hotmail.com
https://han-zhang.weebly.com

Employment

Teaching Fellow, Department of Economics, University of Warwick
10/2021 - present.

Lecturer, Department of Economics, University of Essex 11/2020 - 07/2021.

Graduate Teaching Assistant, Department of Economics, University of Essex
2017 - 2020.

Education

PhD, **Economics**, University of Essex, Colchester, UK 10/2016 - 03/2022

- Thesis title: *The Exact Discrete Time Representation of Continuous Time Models with Unequally Spaced Data*
- Supervisor: Prof Marcus Chambers
- Viva examiners: Prof Roderick McCrorie (University of St Andrews) and Dr Gustavo Fruet Dias (University of East Anglia)

MSc (with Distinction), **Economics and Econometrics**, University of Essex, UK
10/2014 - 09/2015

MSc, **Money, Banking and Finance**, University of St Andrews, UK
09/2013 - 09/2014

MSc, **Finance**, Newcastle University, UK 09/2012 - 09/2013

Bachelor of Management, **Financial Management**, Hunan University of Commerce, Changsha, China 09/2008 - 06/2012

Research Interests

Time Series Econometrics, Continuous Time Modelling with Irregularly Spaced Sample

Referees

Prof Marcus Chambers
University of Essex
Department of Economics
CO4 3SQ, Colchester, UK
mchamb@essex.ac.uk

Prof Gianluigi Vernasca
University of Essex
Department of Economics
CO4 3SQ, Colchester, UK
gvern@essex.ac.uk

Dr Alexander Clymo
University of Essex
Department of Economics
CO4 3SQ, Colchester, UK
a.clymo@essex.ac.uk

JOB MARKET PAPER

Exact Discrete Time Representation of Non-stationary Continuous Time Systems with Unequally Spaced Data

This paper presents an exact discrete time representation of non-stationary continuous time systems with unequally spaced flows and mixed stocks and flows. The approach to obtain the exact discrete time representation with flow variables does not depend on the continuous time parameter matrix being non-singular, namely the underlying continuous time system may be non-stationary. In both cases the exact discrete time representations follow a VARMA(1, 1) process with time-varying parameters and heteroskedasticity, despite that the underlying continuous time model has constant parameters and homoskedasticity. The time-varying parameters and the heteroskedastic variance arise due to the variations in the sampling intervals, whereas the moving average disturbances arise due to the flow nature of the observations. A Monte Carlo simulation on estimation of a cointegrated continuous time system with unequally spaced flows is conducted, aiming at assessing estimate properties when unequal sampling intervals are correctly accounted for. Simulation evidence indicates the favour of exact discrete time models accounting for the irregularity of sampling intervals.

WORKING PAPER

Time-Varying Parameters and Heteroskedasticity: Continuous Time Systems with Unequally-Spaced Data (with Marcus Chambers)

This paper presents an exact discrete time representation of a system of stochastic differential equations, which are observed at unequally-spaced intervals. Exact discrete time representations for unequally spaced data are provided when observations are strictly stocks, strictly flows, or a mixture of both. By allowing observation intervals to vary, the exact discrete time representations, in all cases, exhibit time-varying parameters and heteroskedasticity. Given that the underlying continuous time system is time invariant, the time-varying characteristic of the parameters and variances is thoroughly generated by the unequal spaced intervals. This suggests that, in some circumstances, evidence of such time variation in estimated discrete time models may merely be a manifestation of the unequally spaced data rather than any inherent time variation in the model itself. Following the theory, some simulation experiments are conduced for assessing the extent that correctly measuring unequal observation intervals can have on the estimated parameters if continuous time models, in addition to an application to political popularity in the UK.

TEACHING EXPERIENCE

Teaching Fellow, Department of Economics, University of Warwick

- *Econometrics 1 (BSc)* (10/2021 - present);
- *Applied Econometrics (BSc)* (10/2022 - present);
- *Quantitative Methods: Econometrics A (MSc)* (10/2021 - present);
- *Quantitative Methods: Econometrics B (MSc)* (01/2022 - present);
- *Econometrics (MSc)* (11/2023 - present);
- *Research in Applied Economics (BSc)* (10/2021 - present);
- *MSc Dissertation (MSc)* (05/2022 - present).

Lecturer in Economics, Department of Economics, University of Essex

- *Introduction to Econometric Methods (BSc)* (2020 - 2021);

- *Economics for Business (BSc)* (2020 - 2021);
- *Research Project: Economics (BSc)* (01/2021 - 04/2021);
- *Final Year Research Project Supervision* (11/2020 - 04/2021);
- *MSc Dissertation Supervision* (04/2021 - 07/2021);

Graduate Teaching Assistant, Department of Economics, University of Essex

- *Intermediate Macroeconomics (BSc)* (2018 - 2019);
- *Economics for Business (BSc)* (2017 - 2018, 2019 - 2020);
- *Introduction to Economics (BSc)* (2017 - 2018, 2019 - 2020);
- *Econometric Methods (BSc)* (2017 - 2018);
- *Econometric Methods (MSc)* (2018 - 2019).

HEA D1 Associate Fellow, UK Professional Standards Framework 2018 - present

ADMINISTRATIVE EXPERIENCE

Year 2 Personal Tutor (University of Essex) 11/2020 - 07/2021
Year 1 Tutor (University of Warwick) 10/2021 - present

OUTREACH

Judge of the Royal Economic Society's Young Economist of the Year Competition in Association with the Financial Times 2019, 2020, 2021

Panelist of Soft Skills and Women's Careers in Economics, Department of Economics, University of Essex 08/03/2021.

Presenter at the Department's online recruitment campaign at the Beijing Institute of Technology, University of Essex 29/10/2019

SPECIALISED TRAININGS

ESRC Workshop on Econometric Modelling with Mixed Frequency and Aggregated Data, University of Essex 05/07/2017

UEA PGR Summer School Big Data Econometrics in R, University of East Anglia 13/05/2019

ESRC Workshop on Predictive Regression Models: Theory and Applications to Returns, University of Essex 09/09/2019

Lancaster PhD Summer School on Applied Macroeconometrics/Time Series, University of Lancaster 25/09/2019 - 27/09/2019

ESRC workshop on Predictability, Forecasting and Monitoring 12/07/2021 - 14/07/2021

SCHOLARSHIPS

Economic and Social Research Council +3 studentship 10/2016 - 09/2019

Software Packages	Matlab, R, Stata, LaTex, EViews
Languages	Chinese (native), English (fluent), German (basic), Russian (basic), Japanese (basic)

Last updated: November 26, 2023