

DENIS TKACHENKO

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EDUCATION

- Ph.D., Economics, Boston University, Boston MA, May 2012 (expected)
Dissertation Title: *Frequency Domain Analysis of DSGE and Stochastic Volatility Models*
Dissertation Committee: Zhongjun Qu, Pierre Perron and Hiroaki Kaido
- M.Litt., Economics, Trinity College Dublin,
Dublin, Ireland, 2007
- M.Sc., Economics, Trinity College Dublin,
Dublin, Ireland, 2006
- B.A.(Mod), Economic and Social Studies (*First Class Honors*), Trinity College Dublin,
Dublin, Ireland, 2005

FIELDS OF INTEREST

Econometric Theory, Macroeconometrics, Financial Econometrics

TEACHING EXPERIENCE

- Teaching Fellow, Advanced Econometrics II (PhD level), Department of Economics, Boston University, Fall 2009 and Fall 2010
- Instructor, Introduction to Econometrics, Department of Economics, Boston University, Spring 2010
- Teaching Fellow, Introduction to Macroeconomics, Department of Economics, Boston University, Fall 2008 and Spring 2009
- Teaching Fellow, M.Sc. Microeconomics, Department of Economics, Trinity College Dublin, Fall 2006
- Teaching Fellow, Economic Theory, Department of Economics, Trinity College Dublin, Spring 2007
- Teaching Fellow, Introduction to Math and Statistics, Department of Economics, Trinity College Dublin, Fall 2005 and Spring 2006

FELLOWSHIPS AND AWARDS

Summer Research Grant, Boston University, 2009, 2010
Dean's Fellowship, Boston University, 2007-Present
Postgraduate Research Award, Trinity College Dublin, 2006
Terence Gorman Prize, Trinity College Dublin, 2006

PUBLICATIONS

"Identification and Frequency Domain QML Estimation of Linearized DSGE Models," (*with Zhongjun Qu*) (Job Market Paper), forthcoming in *Quantitative Economics*.

WORKING PAPERS

"Frequency Domain Analysis of Medium Scale DSGE Models with Application to Smets and Wouters (2007)," (*with Zhongjun Qu*), October 2011.

"Frequency Domain QML Volatility Estimation with Noisy High Frequency Data," October 2011.

WORK IN PROGRESS

"Realized Volatility Forecasting with Filtered High Frequency Data"

CONFERENCES AND PRESENTATIONS

10th Annual *Advances in Econometrics* Conference "DSGE Models in Macroeconomics – Estimation, Evaluation and New Developments," SMU, Dallas, TX, November 2011
Western Economic Association International (WEAI) Graduate Student Workshop, San-Diego, CA, June 2011
Royal Economic Society (RES) Conference, London, UK, April 2011

LANGUAGES

Russian (native), English (fluent), French (intermediate)

COMPUTER SKILLS: STATA, MATLAB, GAUSS, Eviews, R, Scientific WorkPlace, LaTeX, Microsoft Office, basic HTML.

CITIZENSHIP/VISA: RUSSIA/F-1 VISA

REFERENCES

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NOVEMBER 2011

DENIS TKACHENKO

Identification and Frequency Domain QML Estimation of Linearized DSGE Models (*with Zhongjun Qu*) (Job Market Paper)

This paper considers issues related to identification, inference and computation in linearized DSGE models. We first provide a necessary and sufficient condition for the local identification of the structural parameters based on the (first and) second order properties of the process. The condition allows for arbitrary relations between the number of observed endogenous variables and structural shocks. Several relevant extensions are also studied. When lack of identification is detected, the method can be used to obtain non-identification curves. For estimation in nonsingular systems, we consider a frequency domain quasi-maximum likelihood estimator and present its asymptotic properties. Finally, we discuss a quasi-Bayesian procedure for estimation and inference. The procedure can be used to incorporate relevant prior distributions and is computationally attractive.

Frequency Domain Analysis of Medium Scale DSGE Models with Application to Smets and Wouters (2007) (*with Zhongjun Qu*)

The paper considers parameter identification, estimation and inference in medium scale DSGE models from a frequency domain perspective using our recently developed framework. The analysis uses the model of Smets and Wouters (2007) as an illustrative example. A key element in the analysis is that we consider identification and inference based both on the full spectrum and on a subset of frequencies, i.e., those corresponding to business cycle fluctuations. The two approaches produce significantly different parameter values and impulse response functions. To obtain further insights, we compare the data spectra with those implied by the different estimates from the model. The results suggest that the business cycle based method is more robust to low frequency misspecification and delivers better estimates of the features that the model is intended to capture.

Frequency Domain QML Volatility Estimation with Noisy High Frequency Data

In this paper we propose a frequency domain quasi-maximum likelihood estimator of the integrated volatility of financial assets when high frequency data is available. The advantage of the frequency domain approach over existing methods in this setting is that the criterion function and hence the computation remain tractable and relatively straightforward for richer (serially dependent) noise specifications than currently considered in the literature. Under mild assumptions, we show that the estimator achieves consistency at the optimal rate and is efficient. The simulation study shows that its finite sample performance is very similar to its time domain analogue in the case of i.i.d. noise, and is substantially better when more realistic autoregressive noise is introduced.