

Jozef BARUNÍK

VITAE 2016 (UPDATED JANUARY)

INSTITUTE OF ECONOMIC STUDIES, CHARLES
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RESEARCH INTERESTS

MAIN FIELDS Quantitative Finance, Financial Econometrics, Applied
Econometrics

SUB-FIELDS (Multivariate) Volatility, Long Memory, Big Data,
Wavelets, Stochastic Catastrophe Theory, Multifractal
models, Neural Networks.

FULL LIST OF PUBLICATIONS CAN BE FOUND [HERE](#)

EDUCATION

2007 – 2011 (Sept.) PhD in Economics, CHARLES UNIVERSITY, Prague
Institute of Economic Studies

2004 – 2006 Mgr. (MSc. equivalent) in Economics, PhDr., CHARLES UNIVERSITY, Prague
Institute of Economic Studies

2001 – 2004 Bc. (BSc. equivalent) in Economics, CHARLES UNIVERSITY, Prague
Institute of Economic Studies

ACADEMIC EXPERIENCE

2013 – CURRENT Research Fellow (Deputy Head of the Department from
2014) at ACADEMY OF SCIENCES OF THE CR
Institute of Information Theory and Automation
Department of Econometrics

2011 – 2012 PostDoc at ACADEMY OF SCIENCES OF THE CR
Institute of Information Theory and Automation
Department of Econometrics

2007 – 2011 Research Assistant at ACADEMY OF SCIENCES OF THE CR
Institute of Information Theory and Automation
Department of Econometrics

2011 – CURRENT Assistant Professor at CHARLES UNIVERSITY in Prague,
Institute of Economic Studies
Department of Macroeconomics and Econometrics, Re-
searcher, Lecturer (Advanced Econometrics, Econometrics
II, Quantitative Finance I, Quantitative Finance II, Ap-
plied Econometrics)

PUBLICATIONS

CITATIONS (SCOPUS): 173,

H-INDEX (SCOPUS): 5

CITATIONS (GOOGLE SCHOLAR): 402,

H-INDEX (GOOGLE SCHOLAR): 8

SELECTED RESEARCH PUBLICATIONS

1. Asymmetric connectedness of stocks: How does bad and good volatility spill over the U.S. stock market? (with E. Kocenda and L.Vacha) *Journal of Financial Markets*, 27, 55–78, (2016). [DOWNLOAD](#)
2. Modeling and Forecasting Persistent Financial Durations (with F.Zikes and N.Shenai) *Econometric Reviews* (forthcoming) [DOWNLOAD](#)
3. Semiparametric Conditional Quantile Models for Financial Returns and Realized Volatility, (with F.Zikes) *Journal of Financial Econometrics*, 14 (1), 185–226, (2016). [DOWNLOAD](#)
4. How does bad and good volatility spill over across petroleum markets? (with E. Kocenda, and L. Vacha) *The Energy Journal*, 36 (3), 309–329, (2015) [DOWNLOAD](#)
5. Realized wavelet-based estimation of integrated variance and jumps in the presence of noise, (with L. Vacha) *Quantitative Finance* 15 (8), pp. 1347-1364, (2015) [DOWNLOAD](#)
6. Realizing stock market crashes: stochastic cusp catastrophe model of returns under the time-varying volatility, (with J. Kukacka) *Quantitative Finance* 15 (6), pp. 959–973, (2015) [DOWNLOAD](#)
7. Modeling and forecasting exchange rate volatility in time-frequency domain, (with T.Krehlik and L.Vacha) *European Journal of Operational Research*, 251 (1), pp. 329 -340, (2016) [DOWNLOAD](#)
8. Are benefits from oil – stocks diversification gone? A new evidence from a dynamic copulas and high frequency data, (with K. Avdulaj) *Energy Economics* , 51, pp. 31–44, (2015) [DOWNLOAD](#)
9. Forecasting the term structure of crude oil futures prices with neural networks, (with B.Malinska) *Applied Energy*, 164, pp.366 -379, (2016) [DOWNLOAD](#)
10. Are Bayesian Fan Charts Useful for Central Banks? Uncertainty, Forecasting and Financial Stability Stress Tests, (with M. Franta, R. Horvath, K. Smidkova) *International Journal of Central Banking* 10 (1), pp.159–187 (2014) [DOWNLOAD](#)
11. Comovement of energy commodities revisited: Evidence from wavelet coherence analysis, (with L. Vacha) *Energy Economics*, 34(1), pp. 241–247, (2012) [DOWNLOAD](#)
12. Can a stochastic cusp catastrophe model explain stock market crashes? (with M.Vosvrda) *Journal of Economic Dynamics and Control* 33, pp. 1824–1836 (2009) [DOWNLOAD](#)

OTHER RESEARCH PUBLICATIONS (INCLUDING CZECH REFEREED JOURNALS)

13. Coupling high-frequency data with nonlinear models in multiple-step-ahead forecasting of energy markets' volatility (with T.Krehlik) *Expert Systems with Applications* (forthcoming) [DOWNLOAD](#)
14. Revisiting the long memory dynamics of the implied-realized volatility relationship: New evidence from the wavelet regression (with M.Hlinkova) *Economic Modelling*, (forthcoming) [DOWNLOAD](#)

15. Gold, Oil, and Stocks (with E. Kocenda, and L. Vacha) *International Review of Economics and Finance* (forthcoming) ([DOWNLOAD](#))
16. An Empirical Model Of Fractionally Cointegrated Daily High And Low Stock Market Prices (with S.Dvorakova) *Economic Modelling*, 45, pp. 193-206, (2015)
17. Can we still benefit from international diversification? The case of the Czech and German stock markets (with K.Avdulaj) *Czech Journal of Economics and Finance*, 63(5):425-442 (2013) ([DOWNLOAD](#))
18. Contagion among Central and Eastern European stock markets during the financial crisis (with L.Vacha) *Czech Journal of Economics and Finance*, 63(5):443-453 (2013) ([DOWNLOAD](#))
19. How do skilled traders change the structure of the market (with L. Vacha, and M. Vosvrda) *International Review of Financial Analysis*, 23, pp. 66-71, (2012) ([DOWNLOAD](#))
20. Neural Networks as Semiparametric Option Pricing Tool (with M. Barunikova) *Bulletin of the Czech Econometric Society, Czech Econometric Society*, 18(28), pp. 66-83 (2011) ([DOWNLOAD](#))
21. Tail Behavior of the Central European Stock Markets During the Financial Crisis (with L. Vacha, and M. Vosvrda) *AUCO Czech Economic Review* 3 4(3) pp. 281-294 (2010) ([DOWNLOAD](#))
22. Vplyv roznych foriem vlastnictva na efektivitu Ceskych a Slovenskych bank: Pristup analyzy stochastickych hranic (with B. Sotak) *Politicka Ekonomie* 2, pp. 207-224 (IF=0.65)
23. Barunik J., Vacha L., Vosvrda M. (2009): Smart Predictors in the Heterogeneous Agent Model, *Journal of Economic Interaction and Coordination*, vol. 4(2), pp. 163-172, Springer ([DOWNLOAD](#)) (IF=0.759)
24. Sentiment Patterns in the Heterogeneous Agent Model (with L. Vacha, and M. Vosvrda) *Prague Economic Papers* 3, pp. 209-219 (2009) ([DOWNLOAD](#)) (IF=0.39)
25. How Do Neural Networks Enhance the Predictability of Central European Stock Returns? , *Finance a uver-Czech Journal of Economics and Finance* 58, pp. 359-376 (2008) ([DOWNLOAD](#))
26. Modelovani Krachu na kapitalovych trzich: Aplikace teorie stochastickych katastrof (with M. Vosvrda) *Politicka ekonomie* 6, pp. 759-771 (2008)

MULTIDISCIPLINARY RESEARCH PUBLICATIONS

27. Behavioural breaks in the heterogeneous agent model: the impact of herding, overconfidence, and market sentiment, (with J.Kukacka) *Physica A*, 392 (23), pp. 5920–5938, (2013) ([DOWNLOAD](#))
28. Understanding the source of multifractality in financial markets (with T. Aste, T. Di Matteo and R. Liu) *Physica A* 391 (17), pp. 4234–4251, (2012) ([DOWNLOAD](#))
29. On Hurst exponent estimation under heavy-tailed distributions (with L. Kristoufek) *Physica A* 389 (18), pp. 3844-3855, (2010) ([DOWNLOAD](#))
30. Monte Carlo-based tail exponent estimator (with L. Vacha) *Physica A* 389 (21), pp. 4863-4874 (2010) ([DOWNLOAD](#))

CHAPTER IN BOOK

31. Wavelet-Based Correlation Analysis of the Key Traded Assets (with E. Kocenda, and L. Vacha) in *Wavelet Applications in Economics and Finance*. Springer International Publishing, pp. 157-183, (2014) [DOWNLOAD](#)

SUBMISSIONS / IN PREPARATION

32. Quantile Cross-Spectral Measures of Dependence between Economic Variables (with T.Kley) (SUBMITTED [DOWNLOAD](#))
33. Measuring the frequency dynamics of financial and macroeconomic connectedness (with T.Krehlik) (SUBMITTED [DOWNLOAD](#))
34. Do co-jumps impact correlations in currency markets? (with L.Vacha) (SUBMITTED)
35. On the modelling and forecasting multivariate realized volatility: Generalized Heterogeneous Autoregressive (GHAR) model (with F.Cech) (SUBMITTED [DOWNLOAD](#))
36. Estimation of Long Memory in Volatility Using Wavelets (with L.Kraicova) (SUBMITTED [DOWNLOAD](#))
37. Semiparametric nonlinear quantile regression model for financial returns (with K.Avdulaj), (SUBMITTED)

GRANT SUPPORT (*main researcher only*)

- 2016 – 2018 (*Principal Investigator*) Grant Agency of the Czech Republic (GA CR)
New measures of dependence between economic variables
- 2016 – 2018 (*Investigator, joint with L.Vacha*) Grant Agency of the Czech Republic (GA CR)
Measurement of frequency-dependent financial risk factors
- 2014 – 2016 (*Local Coordinator*) of the collaborative project under the 7th FP for EU research
Financial Distortions and Macroeconomic Performance: Expectations, Constraints and Interaction of Agents
- 2014 – 2016 (*Principal Investigator, (joint with E.Kočenda from CERGE-EI)*)
Grant Agency of the Czech Republic (GA CR)
Dynamic correlations and financial market risk
- 2013 – 2015 (*Principal Investigator*) Grant Agency of the Czech Republic (GA CR)
Multivariate spectral analysis of financial markets
- 2013 – 2015 (*Investigator, joint with L.Vacha*) Grant Agency of the Czech Republic (GA CR)
Wavelet analysis of nonstationary and long memory economic time series.
- 2008 – 2010 (*Principal Investigator*) Grant Agency of Charles University (GA UK)
New Nonlinear Capital Markets Theories: Fractal, Bifurcational & Behavioral Approach

TEACHING EXPERIENCE

INSTITUTE OF ECONOMIC STUDIES, CHARLES UNIVERSITY IN PRAGUE

2013 – CURRENT	ADVANCED ECONOMETRICS – <i>Lectures</i>	(Masters)
2011 – 2013	ECONOMETRICS II – <i>Lectures</i>	(Bachelors)
2007 – CURRENT	APPLIED ECONOMETRICS – <i>Lectures / Seminars</i>	(Masters)
2007 – CURRENT	QUANTITATIVE FINANCE I – <i>Lectures / Seminars</i>	(Masters)
2007 – CURRENT	QUANTITATIVE FINANCE II – <i>Lectures / Seminars</i>	(Masters)
2007 – 2011	ADVANCED ECONOMETRICS – <i>Seminars</i>	(Masters)

My lectures and seminars consecutively rank among “BEST COURSES TAUGHT AT THE IES” in years 2010 – 2015, see [AWARDS](#) section for details.

RESEARCH VISITS

FEBRUARY 2015 Ruhr-Universitaet Bochum, Department of Mathematics, Institute of Statistics
FEBRUARY 2012 (INVITED) ECARES - Solvay Brussels School of Economics and Management,
SEPTEMBER 2013 Université libre de Bruxelles (prof. D.Veredas)

APRIL 2009 CENDEF - Center for Nonlinear Dynamics in Economics and Finance,
Department of Quantitative Economics, University of Amsterdam
(prof. C. Hommes)

PROFESSIONAL SERVICES

CURRENT

COMMITTEES Grant Agency of the Czech Republic, Evaluation Committee (Member)
EDITORIAL BOARD Journal of Economic Interaction and Coordination
EDITORIAL BOARD Czech Journal of Economics and Finance

PAST

REFEREEING (approximately 60 times) Selected list of journals: Annals of Finance, Computational Statistics & Data Analysis, Energy Economics, International Journal of Forecasting, Journal of Econometrics, Journal of Economic Behavior & Organization, Journal of Economic Dynamics and Control, Journal of Financial Markets, Journal of International Money and Finance, Neural Network World, Physica A, Quantitative Finance, Studies in Nonlinear Dynamics & Econometrics, The Energy Journal

EDITOR The Czech Economic Review
EDITOR Bulletin of the Czech Econometric Society

AWARDS

- 2016 “GOLDEN COURSE TAUGHT AT THE FSV”
for Quantitative Finance I Lectures
- 2016 “BEST COURSES TAUGHT AT THE IES”
for Quantitative Finance I Lectures
- 2015 “ENERGY ECONOMICS CONTEST AWARD”
1st place in the Energy Economics Contest (with B.Malinska)
- 2015 “GOLDEN COURSE TAUGHT AT THE FSV”
for Quantitative Finance I Lectures
- 2015 “BEST COURSES TAUGHT AT THE IES”
for Advanced Econometrics and Quantitative Finance I Lectures
- 2014 “BEST COURSES TAUGHT AT THE IES”
for Applied Econometrics Lectures
- 2014 “ECONOMIC RESEARCH AWARD” (CZECH NATIONAL BANK)
for the work “Are Bayesian Fan Charts Useful for Central Banks?
Uncertainty, Forecasting, and Financial Stability Stress Tests”
- 2014 “BEST COURSES TAUGHT AT THE IES”
for Advanced Econometrics Lectures
- 2013 “ENERGY ECONOMICS CONTEST AWARD”
1st place in the Energy Economics Contest (with K.Avdulaj)
- 2013 “BEST COURSES TAUGHT AT THE IES”
for Quantitative Finance I Lectures
- 2012 “GOLDEN COURSE TAUGHT AT THE FSV”
for Applied Econometrics Lectures
- 2012 “OTTO WICHTERLE AWARD BY THE ACADEMY OF SCIENCES OF THE CZECH REPUBLIC”
- 2012 “ČEZ CORPORATE CHAIR HOLDER (2012+) ”
- 2012 “BEST COURSES TAUGHT AT THE IES”
for Quantitative Finance I Lectures
- 2011 “ENERGY ECONOMICS CONTEST AWARD”
1st place in the Energy Economics Contest (with L.Vacha)
- 2011 “CZECH ECONOMETRIC SOCIETY AWARD”
1st place in the Competition for the Best Student Paper in Theoretical Economics
- 2011 “BEST COURSES TAUGHT AT THE IES”
for Advanced Econometrics seminars and Quantitative Finance I Lectures
- 2010 “BEST COURSES TAUGHT AT THE IES”
for Applied Econometrics and Quantitative Finance I Lectures
- 2010 “CZECH ECONOMETRIC SOCIETY AWARD”
3rd place in the Competition for the Best Student Paper in Theoretical Economics

CONFERENCE PRESENTATIONS (SELECTED)

KEYNOTE LECTURES

International Scientific Conference, European Integration of S.E.E. Countries EQREM ÇABEJ
UNIVERSITY OF GJIROKASTRA (ALBANIA) · *Multivariate Stock Market Volatility*

INVITED

- Non- and Semiparametric Volatility and Correlation Models, (PADERBORN)
· *Semiparametric Conditional Quantile Models for Financial Returns and Realized Volatility*
ECARES - Solvay Brussels School of Economics and Management, Université libre de Bruxelles, (BRUXELLES)
- *Wavelet-based realized covariation theory*
International Conference on Computational and Financial Econometrics, (LONDON)
- *Wavelet-based realized covariation theory*

REGULAR

International Conference on Computational and Financial Econometrics, (LONDON)

· *Wavelet-based realized variance estimator*

Econophysics Colloquium (TAIPEI, TAIWAN)

· *Distinguishing between types of multifractality: Evidence from high-frequency data*

The 2010 International Symposium on Econometric Theory and Applications (SINGAPORE)

· *Monte Carlo-based tail exponent estimator*

Workshop on Optimal Control, Dynamic Games and Nonlinear Dynamics (AMSTERDAM)

· *How do skilled traders change the structure of the market*

Eastern Economic Association Annual Conference (NEW YORK, USA)

· *Dynamic Strategies in the Heterogeneous Agent Model*

9th Asia-Pacific Complex Systems Conference (TOKYO, JAPAN)

· *Smart Traders with Memory in Heterogeneous Agent Model*

International Symposium on Stochastic Systems Theory and Its Applications (KOBE, JAPAN)

· *Wavelet Analysis of Stock Markets During the Financial Crisis*

· *Smart Traders with Memory in Heterogeneous Agent Model*

14th international Conference on Computing in Economics and Finance, (PARIS, FRANCE)

· *Stochastic Cusp Catastrophe Application to Stock Market Crashes Modeling*

· *Sentiment Patterns in the Heterogeneous Agent Model*

ESHIA/WEHIA, (WARSAW, POLAND)

· *Smart Predictors in the Heterogeneous Agent Model*

International Mathematica User Conference, (CHAMPAIGN, ILLINOIS, USA)

· *Stock-Market Crash Modeling: Cusp Catastrophes by Mathematica*

Winter WEHIA, (TAIPEI, TAIWAN)

· *Sentiment in the Heterogeneous Agent Model*

LANGUAGES

SLOVAK: Mother tongue

CZECH: Mother tongue

ENGLISH: Fluent (English Language State Certificate, 2000)

ITALIAN: Basics

GERMAN: Basics

COMPUTER SKILLS

Basic Knowledge: E-views, C++, HTML, PHP, MySQL

Intermediate Knowledge: \LaTeX , Mathematica, MATLAB, R, Ox, Excel, Word, PowerPoint

INTERESTS AND ACTIVITIES

Technology, Programming, Econometrics

Road Cycling, Swimming, Cross-country Skiing, Jazz, Food, and Wine