Jozef Barunìk

vitae 2022 (October)

Academic Experience

2017/4 – current	Associate Professor (habilitation) at Charles University in Prague, *Institute of Economic Studies* Department of Macroeconomics and Econometrics, Master in Finance and Data Analytics program director, Researcher, Lecturer (Advanced Econometrics, Econometrics II, Quantitative Finance I, Quantitative Finance II, Applied Econometrics)
2011/10 – 2017/3	Assistant Professor at Charles University in Prague, *Institute of Economic Studies* Department of Macroeconomics and Econometrics, Researcher, Lecturer (Advanced Econometrics, Econometrics II, Quantitative Finance I, Quantitative Finance II, Applied Econometrics)
2013 – current	Research Fellow (Deputy Head of the Department from 2014, Head of the Department from 2018) 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

Education

2007/9 – 2011/9	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

Publications

Citations (Google Scholar): 3407, h-index (Google Scholar): 27
ResearcherID: G-7617-2014

Submissions / In Preparation

1. Dynamic Networks in Large Financial and Economic Systems (with M.Ellington) (preprint 2021 Download)
2. Deep Reinforcement Learning for Dynamic Decision Making in Economics (with L.Vacha)
3. Dynamic industry uncertainty networks and the business cycle (with M.Bevilacqua and R.Faff) (preprint 2021 Download)
4. Deep Learning, Predictability, and Optimal Portfolio Returns (with M.Babiak) (preprint 2020 Download)
5. Asset Pricing with Quantile Machine Learning (with M.Hronec)
6. Dynamic Network Risk (with M.Ellington) (preprint 2021 Download)
7. Uncertainty Network Risk and Currency Returns (with M.Babiak) (preprint 2021 Download)
8. Tail Risks, Asset prices, and Investment Horizons (with M.Nevrla) (preprint 2021 Download)

Selected Research Publications

9. Asymmetric Network Connectedness of Fears (with M.Bevilacqua, and R.Tunaru), *The Review of Economics and Statistics* , forthcoming (2022) Download
10. Measurement of common risks in tails: A panel quantile regression model for financial returns (with F.Cech) *Journal of Financial Markets*, 52 (2021) Download
11. Forecasting dynamic return distributions based on ordered binary choice (with S.Anatolyev) *International Journal of Forecasting*, 35(3), pp.823-835 (2019) Download
12. Quantile Coherency: A General Measure for Dependence between Cyclical Economic Variables (with T.Kley) *The Econometrics Journal*, forthcoming (2019) Download
13. Measuring the Frequency Dynamics of Financial Connectedness and Systemic Risk (with T.Krehlik) *Journal of Financial Econometrics*, 16 (2), pp. 271 296 (2018) Download
14. Do co-jumps impact correlations in currency markets? (with L.Vacha) *Journal of Financial Markets*, 37, pp.97-119 (2018) Download
15. Modeling and Forecasting Persistent Financial Durations (with F.Zikes and N.Shenai) *Econometric Reviews*, 36:10, 1081-1110 (2017) Download
16. 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
17. Semiparametric Conditional Quantile Models for Financial Returns and Realized Volatility, (with F.Zikes) *Journal of Financial Econometrics*, 14 (1), 185–226, (2016). Download
18. Estimation of Financial Agent-Based Models with Simulated Maximum Likelihood (with J.Kukacka) *Journal of Economic Dynamics and Control*, 85, pp. 21-45 (2017) Download

19. Asymmetric volatility connectedness on forex markets (with E. Kocenda and L.Vacha) *Journal of International Money and Finance*, 77C, pp. 39-56, (2017). DOWNLOAD

20. Cyclical properties of supply-side and demand-side shocks in oil-based commodity markets (with T. Krehlik) *Energy Economics*, 65:208-218 (2017) DOWNLOAD

21. Good volatility, bad volatility: Which drives the asymmetric connectedness of Australian electricity markets? (with N.Apergis and M.C.Lau) *Energy Economics*, 66:108-115 (2017) DOWNLOAD

22. 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

23. 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

24. 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

25. 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

26. 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

27. 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

28. Comovement of energy commodities revisited: Evidence from wavelet coherence analysis, (with L. Vacha) *Energy Economics*, 34(1), pp. 241–247, (2012) DOWNLOAD

29. 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)

30. On the modelling and forecasting multivariate realized volatility: Generalized Heterogeneous Autoregressive (GHAR) model (with F.Cech) *Journal of Forecasting*, 36, pp.181 206 (2017) DOWNLOAD

31. Estimation of Long Memory in Volatility Using Wavelets (with L.Kraicova) *Studies in Nonlinear Dynamics & Econometrics* (forthcoming) DOWNLOAD

32. A semiparametric nonlinear quantile regression model for financial returns (with K.Avdulaj), *Studies in Nonlinear Dynamics & Econometrics*, 21(1), pp. 81 97 (2017)

33. Combining high frequency data with non-linear models for forecasting energy market volatility (with T.Krehlik) *Expert Systems with Applications*, 55, pp. 222-242 (2016) DOWNLOAD

34. Revisiting the long memory dynamics of the implied-realized volatility relationship: New evidence from the wavelet regression (with M.Hlinkova) *Economic Modelling*, 54, pp.503-514 (2016) DOWNLOAD

35. Gold, Oil, and Stocks: Dynamic Correlations (with E. Kocenda, and L. Vacha) *International Review of Economics and Finance* 42, pp. 186 201 (2016) (DOWNLOAD)

36. An Empirical Model Of Fractionally Cointegrated Daily High And Low Stock Market Prices (with S.Dvorakova) *Economic Modelling*, 45, pp. 193 206, (2015)

37. 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)
38. 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)
39. 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)
40. 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)
41. 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)
42. Vplyv roznych foriem vlastnictva na efektivitu Ceskych a Slovenskych bank: Pristup analyzy stochastickych hranic (with B. Sotak) *Politicka Ekonomie 2*, pp. 207-224
43. Smart Predictors in the Heterogeneous Agent Model (with L. Vacha, and M. Vosvrda) *Journal of Economic Interaction and Coordination*, vol. 4(2), pp. 163-172, (2009) Springer (DOWNLOAD)
44. Sentiment Patterns in the Heterogeneous Agent Model (with L. Vacha, and M. Vosvrda) *Prague Economic Papers* 3, pp. 209-219 (2009) (DOWNLOAD)
45. 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)
46. Modelovani Krachu na kapitalovych trzich: Aplikace teorie stochastickych katastrof (with M. Vosvrda) *Politicka ekonomie* 6, pp. 759-771 (2008)

Multidisciplinary Research Publications

47. Forecasting the term structure of crude oil futures prices with neural networks, (with B.Malinska) *Applied Energy*, 164, pp.366 -379, (2016) DOWNLOAD
48. 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
49. 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
50. On Hurst exponent estimation under heavy-tailed distributions (with L. Kristoufek) *Physica A* 389 (18), pp. 3844-3855, (2010) DOWNLOAD
51. Monte Carlo-based tail exponent estimator (with L. Vacha) *Physica A* 389 (21), pp. 4863-4874 (2010) DOWNLOAD

Chapter in Book

52. 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

53. Volatility spillovers on oil and forex markets (with E. Kocenda) in *Routledge Handbook of Energy Economics.* Taylor & Francis, (forthcoming 2019)

Grant Support *(main researcher only)*

2019 – 2023	*(Principal Investigator, joint with W.K.Haerdle from MFF UK and HU Berlin)* Grant Agency of the Czech Republic (GA CR EXPRO) Dynamic Models for the Digital Finance
2020 - 2025	*(Local Coordinator)* of the collaborative EU Grant COST ACTIONS 2020 2025 project Fintech and Artificial Intelligence in Finance - Towards a transparent financial industry
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 – *Lectures*	(Masters)
2011 – 2013	Econometrics II – *Lectures*	(Bachelors)
2007 – current	Applied Econometrics – *Lectures / Seminars*	(Masters)
2007 – current	Quantitative Finance I – *Lectures / Seminars*	(Masters)
2007 – current	Quantitative Finance II – *Lectures / Seminars*	(Masters)
2007 – 2011	Advanced Econometrics – *Seminars*	(Masters)

My lectures and seminars consecutively rank among "Best courses taught at the IES" in years 2010 – 2021, see Awards section for details.

Theses Supervision

Current PhD students	L.Nechvatalova, M.Hronec, J.Kurka, M.Nevrla, L.Janasek, B.Malinska
PhD students (finished)	F.Cech (June 2019) T.Krehlik (Sept 2017), K.Avdulaj (Feb 2016), J.Kukacka (April 2016)
External Examiner	PhD Dissertation of N.Nava, ULC, London, UK.
Master Theses	61 supervised (20 awarded)
Bachelor Theses	4 supervised

Research Visits

march 2020 London School of Economics (Systemic Risk Centre)

MARCH 2019	Humboldt-Universitat zu Berlin, School of Business and Economic, C.A.S.E.
SEPT 2018	Humboldt-Universitat zu Berlin, School of Business and Economic, C.A.S.E.
JULY 2017	Humboldt-Universitat zu Berlin, School of Business and Economic, C.A.S.E.
MAY 2016	London School of Economics
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

EXTERNAL CONSULTANT	Market Intelligence division, Bank of England
PRESIDENT	Czech Econometric Society
EDITORIAL BOARD	Journal of Economic Interaction and Coordination
EDITORIAL BOARD	Czech Journal of Economics and Finance
EDITORIAL BOARD	Digital Finance
EDITORIAL BOARD	Kybernetika

PAST

COMMITTEES	Grant Agency of the Czech Republic, Evaluation Committee (Member)
REFEREEING	(frequently for several journals) Selected list of journals: Energy Economics, International Journal of Forecasting, Journal of Econometrics, Journal of Business & Economic Statistics , Journal of Economic Behavior & Organization, Journal of Economic Dynamics and Control, Journal of Financial Markets, Journal of International Money and Finance, The Energy Journal
EDITOR	The Czech Economic Review
EDITOR	Bulletin of the Czech Econometric Society

Awards

2021	"Golden course taught at the FSV" for Applied Econometrics Lectures
2021	"Best courses taught at the IES" for Advanced Econometrics and Financial Econometrics I
2020	"Best courses taught at the IES" for Applied Econometrics
2019	"Best courses taught at the IES" for Applied Econometrics
2018	"Golden course taught at the FSV" for Applied Econometrics Lectures
2018	"Best courses taught at the IES" for Advanced Econometrics and Quantitative Finance I Lectures
2017	"Golden course taught at the FSV" for Quantitative Finance I Lectures
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 (joint work 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 QF I Lectures
2014	"Best courses taught at the IES" for Applied Econometrics Lectures
2014	"Economic Research Award" (Czech National Bank)
2014	"Best courses taught at the IES" for Advanced Econometrics Lectures
2013	"Energy Economics Contest Award" 1st place (joint work 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 (joint work with L.Vacha)
2011	"Czech Econometric Society Award" 1st place (Best Student Paper)
2011	"Best courses taught at the IES" for Advanced Econometrics and QF I Lectures
2010	"Best courses taught at the IES" for Applied Econometrics and QF I Lectures
2010	"Czech Econometric Society Award" 3rd place (Best Student Paper)

Languages

Slovak	Mothertongue
Czech	Mothertongue
English:	Fluent (English Language State Certificate, 2000)
Italian:	Basics
German:	Basics

Computer Skills

Basic Knowledge:	C++, html, php, mySQL
Intermediate Knowledge:	Julia, LaTeX, Python, Mathematica, MATLAB, R, Ox

Interests and Activities

Family
Technology, Programming, Artificial Intelligence
Road Cycling, Running, Cross-country Skiing, Jazz, Food, and Wine