# Lukáš Vácha

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## Education

2001 - 2007: PhD. degree, Institute of Economic Studies at the Faculty of Social Sciences, Charles University in Prague.

1998 - 2001: Mgr. degree - Institute of Economic Studies at the Faculty of Social Sciences, Charles University in Prague (Master equivalent).

1993 - 1996: Bachelor at the Czech Technical University - Faculty of Nuclear Sciences and Physical Engineering.

## Employment

2000 - present: Research fellow, Academy of Sciences of the Czech Republic – Institute of Information Theory and Automation, Department of Econometrics.

2013 - present: IES FSV UK, Research fellow, Lecturer, (30% contract)

2017 - 2021: Grant Agency of the Czech Republic, Evaluation Committee (panel 403).

## Research Interests

Machine learning, Reinforcement learning in decision making

Time series econometrics, Spectral analysis, Wavelets.

Estimators of Realized volatility, Application of wavelets in finance.

Dynamic correlations, Wavelet coherence, Locally stationary processes.

## Recent Publications

Growth cycle synchronization of the Visegrad Four and the European Union (with L. Hanus). **Empirical Economics**, 2020, vol 58, pp. 1779-1795.

Comovement and disintegration of EU sovereign bond markets during the crisis. (with F. Smolik, J. Baxa ) **International Review of Economics and Finance**, 2019, vol 64, pp. 541 - 556

Do co-jumps impact correlations in currency markets? (with J. Barunik ). **Journal of Financial Markets**, 2018, vol 37, pp. 97-119.

Asymmetric volatility connectedness on the forex market (with J. Barunik and E. Kocenda). **Journal of International Money and Finance**, 2017, vol 77, pp. 39-56.

Asymmetric connectedness on the U.S. stock market: Bad and good volatility spillovers (with J. Barunik and E. Kocenda). **Journal of Financial Markets**, 2016, vol 27, pp. 55-78.

Modeling and forecasting exchange rate volatility in time-frequency domain (with J. Barunik and T. Krehlik). **European Journal of Operational Research**, 2016, vol. 251(1), pp. 329-340.

Gold, oil, and stocks: Dynamic correlations (with J. Barunik and E. Kocenda). **International Review of Economics & Finance**, 2016, vol 42, pp. 186-201.

Volatility spillovers across petroleum markets (with J. Barunik and E. Kocenda). **The Energy Journal**, 2015, vol. 36(3), pp. 309-329.

Realized wavelet-based estimation of integrated variance and jumps in the presence of noise (with J. Barunik). **Quantitative Finance**, 2015, vol. 15(8), pp. 1347-1364.

Time–frequency dynamics of biofuel–fuel–food system (with Janda K., Kristoufek L., Zilberman D). **Energy Economics**, 2013, vol. 40, Pages 233-241.

How do skilled traders change the structure of the market (with J. Barunik, M. Vosvrda). **International Review of Financial Analysis**, 2012, vol. 23, pp. 66-71.

Co-movement of energy commodities revisited: Evidence from wavelet coherence analysis (with J. Barunik). **Energy Economics**, 2012, vol. 34, pp. 241-247.

Smart Predictors in the Heterogeneous Agent Model (with J. Barunik, M. Vosvrda). **Journal of Economic Interaction and Coordination**, 2009, vol. 4(2), pp. 163-172, Springer.

## Work in Progress

Long term project: **Dynamic decision making with Reinforcement learning** (with J Barunik). The project is focused on solving the decision making problems with quantile decision maker that has information capacity constraints.

**Time-Frequency Response Analysis of Monetary Policy Transmission**. Paper with L. Hanus. The manuscript will be sent to a journal within a month.

## Citations

Citations Scopus: 713, h=9

Web of Science: 679, h=9

Google scholar citations: 1367, h=15

## Teaching

2004 - current: (Garant/Lecturer): Financial Econometrics I, II (former name Quantitative Finance I, II), (MA course) Institute of Economic Studies, Charles University.

2004 - 2021: Lecturer: Business Cycle Theory, (MA course) Institute of Economic Studies, Charles University.

2002 - 2006: Lecturer/ assistant: Economic Dynamics I, II, (MA, PhD courses) Economic Dynamics, Institute of Economic Studies, Charles University.

2004 - 2009: Lecturer: Time series analysis with STATISTICA: 2-days intensive courses for customers of the Statsoft Czech.

*Master/Bachelor thesis*

Master thesis: 12

Bachelor thesis: 5

*PhD Students*

Currently supervising Luboš Hanus

L Krištoufek - Graduated 2013

## Research Visits

2009: CeNDEF - Center for Nonlinear Dynamics in Economics and Finance.

2012: ECARES Universite Libre de Bruxelles

## Organizing activities

Co-organizer of the conference Statistics of Machine learning, Prague 2019, 2020, 2021.

## Participation on Grant Projects

*Principal investigator*

2016 - 2018: Frequency dependent measurement of financial risk (Grant Ga ČR No. 16-14151S)

2013 - 2015: Wavelet analysis of nonstationary and long memory economic time series (Grant Ga ČR No. 13-24313S)

2008 - 2010: Analysis of the Heterogeneous Agents Models in Finance (Grant Ga ČR No. 402/08/P207)

*Team member*

2019 - 2023 DyMoDiF - Dynamic Models for the Digital Finance (Grant Ga ČR EXPRO, No 19-28231X)

2016 - 2018: Jozef Barunik: Frequency dependent measurement of financial risk (Grant Ga ČR No. 16-14151S)

2015 - 2017: The 7th FP for EU research. Financial Distortions and Macroeconomic Performance: Expectations, Constraints and Interaction of Agents, No. FP7-SSH-612955 (FinMaP).

2014 - 2016: Jozef Barunik: Dynamic correlations and financial market risk The Czech Science Foundation Project No.14-2412195S.

2013 - 2015: Jozef Barunik: Multivariate spectral analysis of financial markets, The Czech Science Foundation Project No. 13-32263S.

2012 - 2018: DYME – Dynamic Models in Economics, the Czech Science Foundation Project No. P402/12/G097.

2009 - 2013: M. Vošvrda: New Approaches to Monitoring and Forecasting Financial Markets (GA ČR 402/09/0965).

2010 - 2012: M. Šmíd: Rational Decision Making at Markets with Asynchronous Trading: Theory and Empirical Evidence (GA ČR P402/10/1610).

2009 - 2011: M. Vošvrda: Nonlinear Dynamics in Monetary and Financial Economics. Theory and Empirical Models. (GA ČR 402/09/H045).

2006 - 2008: M. Šmíd: Mathematical modeling of the microstructure of the financial markets with the non-synchronous trading (GA ČR 402/06/1417).

2004 - 2006: M. Vošvrda: Nonlinear Dynamics and Econometrics of Capital Markets. (GAUK 454/2004/A-EK FSV).

# Conference Presentations

## *Keynote Lectures*

International Scientific Conference, European Integration of S.E.E. Countries. University of Gjirokastra (Albania), 2011. WAVELETS IN ECONOMIC MODELING.

## *Invited Lectures*

Non- and Semiparametric Volatility and Correlation Models, (Paderborn 2014): Asymmetric connectedness of stocks: How does bad and good volatility spills over the U.S. stock market?

ECARES Université Libre de Bruxelles, 2012: WAVELET ANALYSIS IN ECONOMIC MODELING.

# Refereeing

Computational Statistics and Data Analysis, Energy Economics, Energy Journal, Macroeconomic Dynamics, Entropy, International Review of Economics and Finance, Journal of Empirical Finance, Algorithmic Finance, Computational Economics, Studies in Nonlinear Dynamics & Econometrics, Kybernetika, AUCO Economic Review, Bulletin of the Czech Econometric Society, Czech Journal of Economics and Finance.

# Awards

2021 Golden course award" at the IES FSV UK for Financial Econometrics I Lectures.

2018 "The best courses taught at the IES" award for Quantitative Finance I.

2017 "Best courses taught at the IES FSV UK" 2017 for Quantitative Finance I Lectures.

2011 Energy Economics Contest Award - for the best work in an area of energy economics.

2015-2017 "Golden course award" at the IES FSV UK for Quantitative Finance I.

2013-2014: Award for the best course at IES FSV UK Quantitative Finance II.

2013,"Golden course award" at the IES FSV UK for Business Cycles Theory. Award for the best course at IES FSV UK Quantitative Finance I.

2011-2012 "Golden course award" at the IES FSV UK for Business Cycles Theory.

2010 "Best courses taught at the IES FSV UK" 2010 for Quantitative Finance I Lectures.

Last updated: November 1, 2021