# IRENA VODENSKA

*Department of Administrative Sciences, Metropolitan College, Boston University*
*808 Commonwealth Avenue, Boston, MA 02215, USA*
*Phone: 617-358-0005; Email: vodenska@bu.edu*

## Education

**PHD**, STATISTICAL FINANCE, University Professors Program, Boston University — 9/2005 – 9/2009
Dissertation*: Interdisciplinary Approaches to Understanding and Forecasting Volatility*
Advisor*: Professor H. Eugene Stanley*
Award for Outstanding Doctoral Dissertation for academic year 2009-2010

**MBA**, MASTER OF BUSINESS ADMINISTRATION, *Major in Finance with International emphasis* — 9/1994 – 5/1996
Owen Graduate School of Management, Vanderbilt University, Nashville, TN

**BS**, MANAGEMENT OF INFORMATION SYSTEMS, *Major in Database Management* — 10/1988 – 10/1993
School of Business Management*,* University of Belgrade*,* Yugoslavia

## Certifications and Charters

**CFA**, CHARTERED FINANCIAL ANALYST, CFA INSTITUTE — NOVEMBER, 2004

**NATIONAL ASSOCIATION OF SECURITIES DEALERS** (NASD)
SERIES 7, SERIES 63, SERIES 55 CERTIFIED SECURITIES DEALER/TRADER — SINCE 1997

## Academic Appointments

**ASSISTANT PROFESSOR**, ADMINISTRATIVE SCIENCES DEPARTMENT, MET COLLEGE, BOSTON UNIVERSITY, *Boston, MA* — 9/2009 - PRESENT

- Taught and developed courses in finance area including investments, corporate finance, derivative securities and markets, multinational finance and financial concepts
- Developed courses for online, blended and face-to-face delivery modes, with technology-enhanced methods an and interactive teaching tools
- Conducted active interdisciplinary research, with continuous grant support and solid publication record in top journals and scientific conferences
- Initiated collaborative research projects involving faculty and students from several MET departments and the Physics department at CAS
- Highly involved in service to the university, college and profession

**SENIOR RESEARCH FELL**OW, DEPARTMENT OF PHYSICS, CAS, BOSTON UNIVERSITY**,** *Boston, MA* — 9/2009 – PRESENT

- Conducted interdisciplinary research in the areas of Econophysics, Complexity Science, Network Theory and Applications
- Supervised PhD students on the following research projects: 1) Developing models and forecasting tools for global financial crisis; 2) investigating endogenous and exogenous factors that contribute to cascading failures and systemic risk buildup in networks of financial institutions; 3) Analyzing influences in coupled financial market networks and news sentiments

**VISITING PROFESSOR**, COLLEGE OF COMPUTER SCIENCE AND ENGINEERING — 9/2014 – PRESENT
SS. CYRIL AND METHODIUS UNIVERSITY, SKOPJE, MACEDONIA

- Collaborated on research projects involving big data analytics in finance and economics
- Lectured in the area of Big data analytics and news sentiment impact on financial markets
- Coordinated writing of a European Commission proposals within the Horizon 2020 framework

**VISITING PROFESSOR**, SCHOOL OF BUSINESS MANAGEMENT, BELGRADE UNIVERSITY, BELGRADE, SERBIA — 9/2015 - PRESENT

- Established research collaboration with the finance department
- Visiting lecture at their international finance program

- Initiated a collaborative research effort on consortium working on a proposal on "Social media applications in policy making" to the European Commission

**Associate Director for Research**, Center for Finance, Law, and Policy, Boston University, *Boston, MA* 4/2012 – 4/2013

- Served as the first associate director of research at the CFLP
- Designed and developed Center's request for proposals (RFP) process
- Participated in research proposal reviews and offered funding recommendations

**Founding Member, Steering Committee**, Center for Finance, Law, and Policy, Boston University 1/2011 – 4/2013

- Participated in the creation of the Center, its policies and mission, since its early conceptual phase
- Contributed to strengthening the research profile of the Center by including it in a major international research proposal that I submitted as the PI to the European Commission

**Lecturer in Finance**, Boston University, *Boston, MA* 9/2002 – 9/2009

- Taught Investments and Portfolio Management courses at Metropolitan College and Questrom
- Taught Financial Management and Capital Budgeting courses at Metropolitan College

**Research Assistant**, Department of Physics, Boston University, *Boston, MA* 9/2005-8/2009

- Engaged in research on volatility return intervals of the S&P 500 index and two common models
- Investigated the relation between volatility in financial markets and Omori processes

**Research Assistant**, Owen Graduate School of Management, Vanderbilt University, *Nashville, TN* 9/1995 – 5/1996

- Involved in research of Initial Public Offerings (IPOs) of privately-owned companies

**Teaching Assistant**, Owen Graduate School of Management, Vanderbilt University, *Nashville, TN* *9/1995 – 5/1996*

- Served as teaching assistant for the International monetary and fiscal policy course

## Professional Experience

**Chief Investment Officer & Founding Partner**, Amectron International LLC, *Boston, MA* *7/2008 – Present*

- Developed investment and trading models for proprietary portfolio management
- Tested and implemented investment strategies based on quantitative research
- Created and applied hedging tactics using derivative securities
- Designed and tested security trading algorithms under various macroeconomic scenarios
- Measured portfolio efficiencies by analyzing risk-return tradeoffs and correlations among different securities comprising the portfolio
- Monitored and dynamically managed financial asset portfolios

**Director of Major Gifts**, Office of Development, New England Baptist Hospital, *Boston, MA* *12/2006 – 4/2008*

- Played significant role in capital campaign as member of the President's cabinet
- Raised significant major gifts from physicians, trustees, and patients
- Initiated portfolio of international prospects from the finance industry that resulted in a seven-figure solicitation

**Major Gifts Officer**, Development and Alumni Relations, Boston University*, Boston, MA* *9/2003 – 12/2006*

- Initiated and developed relationships with Financial Industry and Wall Street based prospects
- Actively cultivated and solicited prospects for BU's Student Village project
- Raised six-figure gifts for naming opportunities at different BU schools and colleges

**Head Trader**, Italian Equity Trading, JPP Eurosecurities Inc., *New York City, NY* *7/2000 – 2/2002*

- Founded and ran the New York based European Markets trading operation
- Advised US institutional clients involved in European portfolio investments
- Analyzed international mergers and acquisitions and developed M&A trading strategies
- Generated and implemented international pair (spread) trading strategies
- Developed an international program trading of index securities and market index futures

**ASSISTANT VICE PRESIDENT**, RISK ARBITRAGE, J.C. BRADFORD & CO. INVESTMENT BANK*, Nashville, TN* *5/1995 – 6/2000*

- Actively involved in raising funds from US Hedge Funds and advising fund managers
- Managed $10+ million proprietary fund invested in US securities markets
- Implemented sophisticated fund risk management using derivative products
- Achieved strong portfolio returns using proprietary developed trading techniques and tools
- Analyzed convertible fixed income securities and developed pricing structure models
- Traded NASDAQ and NYSE common stock and preferred convertible securities
- Designed and implemented convertible bonds and risk arbitrage databases

**INFORMATION SYSTEM ARCHITECT AND ANALYST**, ALMAKO BANK, *Skopie, Republic of Macedonia* *9/1992 – 8/1994*

- Designed and developed variety of banking databases systems such as:
  - International interbank electronic payment system database
  - Letter of credit database for international clients accompanied by an alert system
  - Domestic and international loan database including payment reminder system
  - Internal bank employee database and bank product database
  - External client and prospective client database

## Teaching, Research, and Service

### *Courses Taught*

- Investment Analysis and Portfolio Management (AD717 F2F, AD717 EL, AD717 OL)
- Derivative Securities and Markets (AD713 F2F)
- Corporate Finance (AD731 F2F, AD731 EL, AD731 OL)
- Multinational Financial Management (AD763 F2F)
- Financial Concepts (MG472 F2F)

### *Research Areas*

- **Big data analytics and complex economic systems**:
  - Using big data including intraday pricing and news streaming to forecast global financial market returns
  - Investigating the relations between news sentiments and risk and return time series for global equities, foreign exchange, and international stock market indices

- **Modeling volatility dynamics in financial markets**:
  - Evaluating predictive power of VIX implied volatility index on the S&P 500 volatility
  - Investigating market microstructure based on clustering analysis of short and long volatility return intervals
  - Exploring relationship between financial market volatility and Omori processes

- **Interdependent network theory and systemic risk modeling**:
  - Using bipartite network approach to simulate toxic assets contribution to financial crisis propagation across the U.S., European and Japanese bank networks
  - Modeling complex financial and economic systems such as bank liquidity networks and interdependent financial market networks
  - Investigating interdependencies in global financial networks using complex principal component analysis and community detection algorithms to study stock and foreign exchange financial markets
  - Studying European Sovereign debt crisis and modeling the relationships within the European bank-Government debt coupled (bi-partite) network

- **Corporate governance networks**:
  - Identifying powerful directors in the US corporate governance network
  - Using network centrality measures as indicators of influence

## *Service*

### *Boston University*

- Chair, Faculty Council Budget Committee, Boston University (2010-2014)
- Vice-Chair, University Council Committee on Budget, Boston University (2010-2014)
- Member, BU Board of Trustees Advisory Committee on Socially Responsible Investments (2013-2014)
- Chair, Administrative Sciences Department Faculty Search Committee, MET (2015-Present)
- Member, Academic Policy Committee, MET (2015-Present)
- Member, Executive Committee, MET (2014-2015)
- Co-chair, AACSB Learning Objectives Committee, Administrative Science Department, MET (2010)
- Member, Administrative Sciences Department Strategic Plan Committee, MET (2010-2011)
- Member, Faculty Expectations Committee, MET (2011)
- Member, Faculty Merit Review Committee, MET (2011-2014)
- Member, Administrative Sciences Department Faculty Search Committee, MET (2012-2013)
- Member, Administrative Science Department Mission Statement Revision Committee, MET (2012)

### *Scientific Journal Reviewer*

- Physica A (2009-present)
- Journal of Economic Interaction and Coordination (JEIC) (2013-Present)
- PlosOne (2013-Present)
- Nature's Scientific Reports (2013-Present)
- Chaos, Solitions &Fractals (2015-Present)

### *CFA Institute – Boston Securities Analyst Society (BSAS)*

- Taught CFA (Chartered Financial Analyst) preparatory courses for Level II CFA Examination (2009-Present)
- Member of the BSAS Educational Committee involved in initiatives to bridge the gap between the financial industry and academia by promoting joint professional programs

## Grants and Awards

1. Principal Investigator (**PI**) for Boston University on **National Science Foundation** (NSF) awarded Grant titled: "**Modeling systemic risk: Finding precursors of emerging financial crises**" – EAGER Award number: SES-1452061 – **Amount $57,721** — 9/2014 – 9/2015

2. Principal Investigator (**PI**) for Boston University on **European Commission** awarded Grant titled "Forecasting Financial Crises" - FET Open Project ''FOC'' 255987 and ''FOC-INCO'' 297149 - **Amount $3.5million for the Consortium of which $300,000 for BU** — 3/2012 – 3/2014

3. Owen Graduate School of Management Fellowship, Vanderbilt University — 9/1995 – 5/1996

4. Alexander Hamilton Fulbright Fellowship — 1994

## Select Synergetic Activities and Skills

### *In the Press*

- Interview: Forecasting and Financial Crisis
  http://forecastingcrises.wordpress.com/2013/06/11/irena-vodenska-foc-project-we-need-financial-regulatory-reform/

- **Simons Foundation – Quanta Magazine: Illuminating Science**
  https://www.quantamagazine.org/20130318-treading-softly-in-a-connected-world/

## Languages

- English, Italian, French, Serbian/Croatian, Bulgarian, Macedonian (native)
- Basic understanding and reading knowledge of Spanish and Greek

## Advisors, Collaborators, and Advisees

- PhD advisor: **Gene Stanley**, William Fairfield Warren Distinguished Professor; Professor of Physics; Professor of Chemistry; Professor of Biomedical Engineering; Professor of Physiology (School of Medicine), Director, Center for Polymer Studies Department of Physics, Boston University

- Research collaborators: **Andreas Joseph**, **Antoaneta Serguieva, and Pablo Winant,** Bank of England, **Di Zhou**, Bloomberg, L.P., **Guido Caldarelli**, Center for Complex Systems, La Sapienza University, Rome, Italy, **Tomislav Smuc, Matija Piskorec,** and **Nino Antulov-Fantulin**, Rudjer Boshkovic Institute, Zagreb, Croatia, **Igor Mozetic** and **Petra Kralj**, Jozhef Shtefan Institute, Ljubljana, Slovenia, **Hideaki Aoyama** and **Yohei Sakamoto**, Kyoto University, Japan, **Yoshi Fujiwara**, University of Hyogo, Japan, **Hiroshi Iyetomi, and Yuta Arai**, Niigata University, Japan, **Stefano Battiston,** University of Zurich, Switzerland, **Sergey Buldyrev**, Yeshiva University, New York, NY, **Shlomo Havlin**, Bar Ilan University, Israel, **Mario Bertella** and **Marislei Nishijima**, Sao Paulo State University, Brazil, **Kazuko Yamasaki**, Tokyo University, Japan, **Dror Kenett**, Office of Financial Research, Washington, D.C., **Lidia Braunstein**, National University of Mar del Plata, Argentina, **Sary Levy-Carciente**, Central University of Venezuela, Caracas

- PhD student advisor and PhD dissertation committee member for: **Xuqing Huang** (graduated in 2013), N**ima Dehmamy and Chester Curme** (graduated in 2015), **Antonio Majdandzic and Asher Mullokandov** (expected graduation in 2016), **Adam Avakian and Alexander Becker** (expected graduation in 2017)

- Masters students research advisor for: **Borui Wang, Sompop Chaichanavitchakij, Hao Zhang, Quan C. Pham, Danling Zhou, Margaret Cruickshanks, Yong Phelam Nkfum, Hualong Yang, Justin Toporcer, Ana Mijailovic, Chiang Shang-Chih (Stanley), Lu Zhang, Fanghui Zhang, Alberto Gomez, Ya-Lan Tsao (Amy), Wenjing Cai**

## Publications

### *Peer-reviewed journal articles*

1. I. Vodenska, H. Aoyama, Y. Fujiwara, H. Iyetomi, Y. Arai, **Interdependencies and causalities in complex financial networks** *(accepted for publication at Plos One, forthcoming in 2016)*

2. A. Majdandzic, L. Braunstein, I. Vodenska, S. Levy, S. Havlin, and H.E. Stanley, **Multiple tipping points and optimal repairing in interacting networks,** *Nature Communications*, 7:10850 | DOI: 10.1038/ncomms10850 | www.nature.com/naturecommunications (2016)

3. I. Vodenska, **Ubiquitous Technology-Enhanced Teaching of Complex Financial Concepts** *International Journal of Learning, Teaching and Educational Research, Vol. 14, No. 2 (2015)*

4. C. Curme, H.E. Stanley, and I. Vodenska, **Coupled network approach to predictability of financial market returns and news sentiments** *International Journal of Theoretical and Applied Finance, Vol 18, No. 7, (*2015)

5. D.Y. Kenett, X. Huang, I. Vodenska, S. Havlin, H.E. Stanley, **Partial correlation analysis: Applications for financial markets,** *Journal of Quantitative Finance, Vol. 15, Issue 4* (2015).

6. M. Piskorec, N. Antulov-Fantulin, P.K. Novak, I. Mozetic, M. Grcar and I. Vodenska, T. Smuc, **Cohesiveness in Financial News and its Relation to Stock Market Volatility**, *Nature Scientific Reports 4, 5038, DOI:10.1038/srep05038* (2014).

7. L. Chitkushev, I. Vodenska, T. Zlateva, **Digital Learning Impact Factors: Student Satisfaction and Performance in Online Courses,** *International Journal of Information & Education Technology, Vol. 4, No. 4 (2014)*

8. X. Huang, I. Vodenska, S. Havlin & H.E. Stanley, **Cascading Failures in Bi-partite Graphs: Model for Systemic Risk Propagation.** *Nature Scientific Reports* 3, 1219; DOI:10.1038/srep01219 (2013).

9. I. Vodenska and L. Chitkushev**, Impact of Euro Adoption on Emerging European Countries**, *Management Journal,* 8(1): 47-67, (2013)

10. X. Huang, I. Vodenska, F.Z. Wang, S. Havlin, and H.E. Stanely, **Identifying influential directors in the United States corporate governance network**. *Physical Review E,* Vol. 84, 046101 (2011)

11. I. Vodenska, F.Z. Wang, P. Weber, K. Yamasaki, S. Havlin, and H.E. Stanley, **Comparison between volatility return intervals of the S&P 500 index and two common models**. *The European Physical Journal B,* Vol. 61, 217-223 (2008)

12. P. Weber, F. Wang, I. Vodenska-Chitkushev, S. Havlin, H.E. Stanley, **Relation between volatility correlation in financial markets and Omori processes occurring on all scales**, *Physical Review E,* Vol. 76, 016109 (2007)

## *Book chapter*

1. D.Y. Kenett, J. Gao, X. Huang, S. Shao, I. Vodenska, S.V. Buldyrev, G. Paul, H.E. Stanley, and S. Havlin, **Network of Interdependent Networks: Overview of Theory and Applications, Chapter 1,** pages 3-36, in *Networks of Networks: The Last Frontier of Complexity,* edited by G. D'Agostino and A. Scala (Springer, Berlin, 2014).

## *Working papers*

1. Y. Sakamoto and I. Vodenska, **Systemic risk propagation in bank-asset network: New perspective of the Japanese banking crisis of the 1990s,** *(under review at the Journal of Complex Networks)*

2. Y. Sakamoto and I Vodenska, **Impact of bankruptcy through asset portfolios** *(under review at the European Physical Journal)*

3. N. Dehmamy, S. Buldyrev, S. Havlin, H.E. Stanley, and I. Vodenska, **A linear response model of systemic risk in bank-asset networks** *(submitted to Journal of Banking and Finance)*

4. I. Vodenska, D. Zhou, A. Becker, D. Kenett, S. Havlin, and H.E. Stanley, **Community interdependencies in global financial markets** *(submitted to Risks, Open Access Risk Management Journal)*

5. A. Joseph and I. Vodenska **"Multiple linear regression-fit networks of international trade and finance"** *(to be submitted to Physica A)*

6. I. Vodenska, D. Zhou, A. Becker, D. Kenett, S. Havlin, and H.E. Stanley, **Modeling systemic risk propagation through interdependent network of equity and foreign exchange markets** (*to be submitted to International Journal of Theoretical and Applied Finance)*

7. A. Moullokandov, N. Dehmami, H.E. Stanley, and I. Vodenska, **"Financial news sentiment structure and entity clustering"** *(to be submitted to Physical Review Letters)*

8. I. Vodenska, **"Financial crisis effect on world trade",** *(working paper)*

9. I. Vodenska and W. Chambers, "**Understanding the relationship between VIX and the S&P 500 volatility",** *(working paper)*

10. I. Vodenska, "**Will the next bubble come from education?"** *(working paper)*

*11.* I. Vodenska, A. Avakian and D. Ou, **"Are European Banks more systemically important than the US Financial Institutions?",** *(working paper)*

*12.* M. Nishijima, I. Vodenska, and G. Zhang, "**Does income level affect the prevalence of diabetes in Brazil?",** *(working paper)*

13. I. Vodenska and W. Cai, **"Federal Reserve announcements' surprise effect on major financial markets"** (working paper)

## *Refereed conference proceedings*

*1.* Vodenska, I., **Innovative Web-Based Tools for Finance Education,** *6th Annual International Conference on Computer Science and Education, June 26-29, 2010, Fulda/Munich, Germany*

2. Vodenska, I., Chitkushev, L. and Zlateva, T., **Integrating Informatics Into Graduate Finance Programs,** *7th Annual International Conference on Computer Science and Education, July 6-10, 2011, Sofia, Bulgaria*

*3.* Vodenska, I. and Chitkushev, L., **Ubiquitous Technology-Enhanced Teaching of Complex Financial Concepts,** *4th International Conference on Computer Supported Education (SCEDU) 2012, April 16-18, 2012, Porto, Portugal*

*4.* Vodenska, I. and Chitkushev, L. **Emerging European Countries and the Euro Adoption Policies,** *Euro-Conference 2012, July 12-14, 2012, Portoroz, Slovenia*

*5.* Vodenska, I. and Chitkushev, L. **Innovative tools for teaching complex financial concepts,** *9th Annual International Conference on Computer Science and Education, Fulda/Wurzburg, Germany, June 29–July 2, 2013*

*6.* Vodenska, I and Chambers, W., **Relation between VIX option-based implied volatility index and S&P 500 index volatility,** *Proc. of the 26th Australasian Finance and Banking Conference (AFBC), Sydney, Australia, December 16-19, 2013*

*7.* Chitkushev, L., Vodenska, I., Zlateva, T., ***Digital Learning Impact Factors: Student Satisfaction and Performance in Online Courses,*** *Proc. of the ICIET 2014: 2nd International Conference on Information and Education Technology, Jan 2-3, 2014, Melbourne, Australia*

*8.* Zhou, D., Vodenska, I., Kenett, D.Y., Stanley, H.E., Havlin, S., **Systemic risk propagation in global interdependent financial markets,** *World Finance Conference, July 2-4, 2014, Ca'Foscari University, Venice, Italy*

9. Vodenska, I., Joseph, A., Stanley, H.E., Chen, G., **Novel forecasting techniques using big data, network science and economics,** *22nd International Conference on Nonlinear Dynamics of Electronic Systems (NDES) 2014, July 4-6, 2014, Albena, Bulgaria* (Proceeding series: Communications in Computer and Information Science, Vol. 438, edited by V. Mladenov and P. Ch. Ivanov, Springer, 2014)

*10.* Zhou, D., Vodenska, I., Kenett, D.Y., Stanley, H.E., Havlin, S., **Systemic importance of global financial markets and distress propagation**, *2014 Financial Management Association (FMA) Annual Meeting, October 15-18, 2014, Nashville, TN*

11. Vodenska, I. and Runchev, N., **Real effective exchange rate and transitional economy of the Republic of Macedonia,** *World Finance and Banking Symposium, December 12-13, 2014, Singapore*

*12.* Curme, C. Stanley, H.E. and Vodenska, I**., Forecasting Global Financial Markets and News Sentiments,** *World Finance and Banking Symposium, December 17-18, 2015, Hanoi, Vietnam*

## *Conference presentations*

1. Vodenska, I., **Using Stock-Trak ® for Investment Analysis and Portfolio Management: An Academic Tool for Real Life Risk Assessment,** *First Instructional Innovation Conference, Boston University, March 2009*

2. Huang, X., Vodenska, I., Havlin, S. and Stanley, H.E., **A New Approach for Determining the Influence of Directors in US Corporate Governance network,** *International Conference on Complex Network Science, May 10-14, 2010, Cambridge, MA*

3. Chitkushev, L., Zlatev, V. and Vodenska, I., **Advantages of Blended Format for International Programs**, *Second Annual FABDE Conference on Distance Education, May 11, 2010, Boston, MA*

4. Vodenska, I., **Using Interactive Synchronous Tablet Tools in Online Finance Courses,** *Third Instructional Innovation Conference, Boston University, March, 2011*

5. Vodenska, I., Zhou, D., Havlin, S. and Stanley, H.E., **Model for Systemic Risk Propagation in Financial Networks***, Latsis Symposium 2012, Economics on the Move, Trends and Challenges from the Natural Sciences, September 11-14, 2012, ETH Zurich, Switzerland*

6. Vodenska, I. and Chitkushev, L., **Web Portal for Financial Informatics Research and Education***, 8th Annual International Conference on Computer Science and Education, July 5-9, 2012, Boston, MA*

7. Vodenska, I., Zhou, D., Kenett, D., Havlin, S. and Stanley, H.E., **Distress Propagation in Coupled Foreign Exchange and Stock Market Networks,** *25th International Conference on Statistical Physics (StatPhys25), Seoul, S. Korea, July 22-26, 2013*

8. Vodenska, I., Dehmami, N., Battiston, S., Havlin, S. and Stanley, H.E., **Model of Financial Network Dynamics under Systemic Risk,** *10th European Conference on Complex Systems (ECCS'13), Barcelona, Spain, Sept. 16-20, 2013*

9. Piškorec, M., Antulov-Fantulin, N., Šmuc, T., Mozetič, I., Novak, P.K., Grčar, M., and Vodenska, I., **Quantifying the Impact of Cohesiveness in Financial News,** *10th European Conference on Complex Systems (ECCS'13), Barcelona, Spain, Sept. 16-20, 2013*

10. Vodenska, I., Dehmami, N., Battiston, S. and Stanley, H.E., **Systemic Risk Propagation from Troubled European Economies to Global Banks and Investment Funds,** *Workshop on Economic Science with Heterogeneous Interacting Agents (WEHIA), Reykjavik, Iceland, June 18-22, 2013*

11. Kenett, D.Y., Huang, X., Vodenska, I., Havlin, S., Stanley, H.E., **Partial Correlation Analysis of the Stock Market,** *Proc. of the 40th Annual Conference of the Eastern Economic Association, March 6-9, 2014, Boston, MA*

12. Joseph, A., Vodenska, I., Stanley, H.E., and Chen, G., (Poster Presentation), **MLR Fit-Network of Global Balance of Payments,** *10th International School and Conference on Network Science, June 2-6, 2014, University of California, Berkeley, CA*

13. Vodenska, I., Dehmamy, N., Mullokandov, A., Novak, P.K., and Mozetic, I., **Financial news sentiment structure and entity clustering,** *10th International School and Conference on Network Science, June 2-6, 2014, University of California, Berkeley, CA*

14. Dehmamy, N., Vodenska, I., Buldyrev, S., Havlin, S., and Stanley, H.E., (Poster Presentation) **A Dynamical Model of Systemic Risk in Bank-Asset Networks**, *10th International School and Conference on Network Science, June 2-6, 2014, University of California, Berkeley, CA*

15. Vodenska, I., Aoyama, H., Fujiwara, Y., Iyetomi, H., Arai, Y., **Interconnectivity between equity and foreign exchange markets,** *10th International School and Conference on Network Science, June 2-6, 2014, University of California, Berkeley, CA*

16. Chitkushev, L., Zlateva, T.,Vodenska, I., Zlatev, V., **Analytics Dashboard Parameters for Digital Learning Management Systems,** *10th Annual International Conference on Computer Science and Education in Computer Science (CSECS 2014), July 4-7, 2014, Albena, Bulgaria*

17. Vodenska, I., **Lead-lag relationships in synchronization financial networks: Crisis vs. non-crisis period dynamics,** *International Workshop on Big Data and Macroeconomics, August 22-24, 2014, Grand Weilea, Maui, Hawaii*

18. Vodenska, I., Dehmamy, N., Mullokandov, A., Novak, P.K., and Mozetic, I., **Understanding the relationship between news analytics and financial time series,** *European Conference on Complex Systems (ECCS'14), September 22-26, 2014, Institute for Advanced Studies (IMT), Lucca, Italy*

19. Aoyama, H., Vodenska, I., Fujiwara, Y., Iyetomi, H., Arai, Y., **Synchronization network of global foreign exchange and equity markets,** *Third International Workshop on Complex Networks and their Applications, November 23-27, 2014, Marrakech, Morocco*

20. Vodenska, I., Dehmamy, N., Buldyrev, S., Havlin, S., and Stanley, H.E., **Systemic stress test in shared portfolio network,** *International School and Conference on Network Science, January 14-16, 2015, Rio de Janeiro, Brazil*

21. Vodenska, I., Curme, C., Stanley, H.E., **Can financial news sentiments predict stock market performance?,** *11th International Network Science Conference, June 1-5, 2015, Zaragoza, Spain*

22. Vodenska, I., Curme, C., Stanley, H.E., **Bi-partite network approach to understanding important predictors in news-markets coupled network,** *2nd Big Data in Economics, Science, and Technology Conference, July 20-22, 2015, Ohrid, Macedonia*

23. Sakamoto, Y. and Vodenska, I, **Dynamics of communities in multiplex synchronization networks,** *11th Econophysics Colloquium (EC2015), September 14-16, 2015, Institute for Economic Studies, Faculty of Social Sciences, Charles University, Prague, Czech Republic*

24. Vodenska, I., Becker, A., Zhou, D., Kenett, D., Stanley, H.E., Havlin, S., **Community analysis of global financial markets,** *Conference on Complex Systems (CCS'15), September 28 – October 2, 2015, Arizona State University, Tempe, AZ*

25. Curme, C., Stanley, H.E., Vodenska, I., **Coupled network approach to predictability of financial market returns and news sentiments**, *Conference on Complex Systems (CCS'15), September 28 – October 2, 2015, Arizona State University, Tempe, AZ*

26. Mullokandov, A., Dehmamy, N., Vodenska, I., Stanley, H.E., Mozetic, I., Kralj-Novak, P., **Empirically validated model of stock return dynamics**, *Conference on Complex Systems (CCS'15), September 28 – October 2, 2015, Arizona State University, Tempe, AZ*

27. Vodenska, H. Aoyama, Y. Fujiwara, H. Iyetomi, Y. Arai, **Interdependencies and causalities in complex financial networks** (poster presentation), 2nd *International School and Conference on Network Science (NetSci-x), January 11-13, 2016, Wroclaw, Poland*

## *Invited talks*

1. Vodenska, I., Wang, F.Z., Havlin, S. and Stanley, H.E**., Similarity of Investment Strategies and Global Financial Crisis,** *Perspectives and Challenges in Statistical Physics and Complex Systems for the Next Decade, November 9-11, 2011, Natal, Brazil*

2. Vodenska, I., Huang, X., Havlin, S. and Stanley, H.E., **Cascading Failures in Bi-partite Graphs: Model for Systemic Risk Propagation,** 8th *International Network Science (NetSci) Conference, June 18-22, 2012, Northwestern University, Evanston/Chicago, IL*

3. Vodenska, I., Dehmami, N., Havlin, S. and Stanley, H.E., **Complexity and Dynamics of Financial and Economic Networks**, *European Conference on Complex Systems (ECCS) 2012, COINET, September 2-7, 2012, Université Libre de Bruxelles, Brussels, Belgium*

4. Vodenska, I., Huang, X., Havlin, S. and Stanley, H.E., **Extreme events and boom-bust processes in complex financial and economic systems**, *New Views on Extreme Events, ETH Risk Center Conference at Swiss Re, Zurich, Switzerland, October 25-26, 2012*

5. Vodenska, I., Dehmami, N. and Stanley, H.E., **Complexity and Systemic Risk Propagation in Global Economic Networks,** *FuturICT Conference at Media Lab, MIT, Cambridge, MA, February 13-14, 2013*

6. Vodenska, I., Dehmami, N., Havlin, S. and Stanley, H.E., **European Sovereign Debt of Greece, Spain, Italy, Ireland and Portugal (GIPSI) Effect on Global Financial Institutions,** 9th *International Network Science (NetSci) Conference, Copenhagen, Denmark, June 3-7, 2013*

7. Vodenska, I., Zhou, D., Havlin, S. and Stanley, H.E., **Cascading Failures in Institutional Investor Network caused by Systemically Important Banks,** *Complexity in Social Systems: From Data to Models, University of Cergy-Pontoise, Paris, France, June 27-28, 2013*

8. Vodenska, I. and Chitkushev, L., **Effects of European Sovereign Debt Crises on Global Financial Markets,** *Global Sustainable Finance Conference, Karlsruhe, Germany, July 4-5, 2013*

9. Vodenska, I., Zhou, D., Dehmami, N., Havlin, S. and Stanley, H.E., **Multiplex network interdependencies of currency markets and global stock market indices,** *Horizons in Social Sciences, IMT Lucca, Tuscany, Italy, July 9-11, 2013*

10. Vodenska, I., Aoyama, H., Fujiwara, Y., Zhou, D., Havlin, S. and Stanley, *H.E.* **Centrality Measures of Systemically Important Global Financial Markets: Eigenvector Approach,** *Financial Networks and Systemic Risk Conference, Kyoto, Japan, July 17-19, 2013*

11. Vodenska, I., **Causes and Consequences of the 2008 Global Financial Crisis**, *The Fifth Anniversary of the Global Financial Crisis of 2008, Federal Reserve Bank of Boston and Massachusetts Council for Economic Education, Boston FED, Boston, Oct 8., 2013*

12. Vodenska, I., **Global Financial Crises Effects on World Trade Relationships**, *Conference on Evolution of International Trading System: Prospects and Challenges, St. Petersburg State University, School of Economics, St. Petersburg, Russia, Oct. 31–Nov. 1, 2013*

13. Vodenska, I., **Multiplex Financial Network Dependencies**, *5th Research Meeting of the Consortium for Systemic Risk Analytics (CSRA), December 12, 2013, MIT Sloan School of Management, Cambridge, MA*

14. Vodenska, I. **Data Analytics in Finance: Opportunities and Challenges,** *BU-IBM Data Analytics Symposium, April 30, 2014, Boston, MA*

15. Vodenska, I., Aoyama, H., Fujiwara, Y., Iyetomi, H., Arai, Y., Stanley, H.E., **Co-moving synchronization network: Model for global financial system dynamics**, *International Conference on Econophysics, May 31–June 2, 2014, East China University of Science and Technology, Shanghai, China*

16. Vodenska, I., **Interdependencies and causalities in coupled financial networks,** *International Conference on Statistical Physics, July 7-11, 2014, Rhodes, Greece*

17. Vodenska, I., **Global stock markets and foreign exchange as coupled financial systems**, *European Conference on Complex Systems (ECCS'14), September 22-26, 2014, Institute for Advanced Studies (IMT), Lucca, Italy*

18. Vodenska, I. **Global Financial Crisis and Social Networks,** *European University of the Republic of Macedonia (EURM), October 1, 2014, Skopje, Macedonia*

19. Vodenska, I. **Network Approach to Systemic Risk and System Response,** *Boston University School of Management (SMG) Research Seminar, November 5, 2014*

20. Vodenska, I., **A systemic stress test model in bank-asset networks**, *6th Research Meeting of the Consortium for Systemic Risk Analytics (CSRA), December 15, 2014, MIT Sloan School of Management, Cambridge, MA*

21. Vodenska, I., **Lead-Lag relationships in synchronization financial market coupled networks,** *March 16, 2015, Graduate School of Simulation Studies, University of Hyogo, Kobe, Japan*

22. Vodenska, I., **Complex Hilbert Principal Component Analysis of foreign exchange and stock market networks**, *March 17, 2015, Macroeconomic Workshop, Tokyo University, Tokyo, Japan*

23. Vodenska, I., **Women in Science and Engineering: Opportunities and Challenges**, *March 19, 2015, Gender Equality Office, Niigata University, Niigata, Japan*

24. Vodenska, I., **Bi-partite network approach in constructing a recommender system for financial time series forecasting**, *May 27, 2015, Faculty of Computer Science and Engineering, Ss. Cyril and Methodius University, Skopje, Republic of Macedonia*

25. Vodenska, I., **Network approach to predictability of news sentiments and financial markets,** *11th Econophysics Colloquium (EC2015), September 14-16, 2015, Institute for Economic Studies, Faculty of Social Sciences, Charles University, Prague, Czech Republic*

26. Vodenska, I., **A systemic stress test model in bank-asset networks**, *Netconomics Satellite, Conference on Complex Systems (CCS'15), September 28 – October 2, 2015, Arizona State University, Tempe, AZ*

27. Vodenska, I. **Predictability of global financial markets using logistic regression and complex networks,** *ECONOPHYS-2015, International Workshop on "Econophysics and Sociophysics", November 27-December 1, 2015, New Delhi, India*

28. Vodenska, I. **Time correlation and news insights into Japanese and US stock market dynamics**, *7th Research Meeting of the Consortium for Systemic Risk Analytics (CSRA), December 1, 2015, MIT Sloan School of Management, Cambridge, MA*