Irena Vodenska

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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

Academic Appointments

Assistant Professor, Administrative Sciences Department, MET College, Boston University, *Boston, MA* — 9/2009 - Present
- Taught finance courses including investments, corporate finance, derivative securities, and markets, multinational finance and financial concepts
- Initiated collaborative research projects involving faculty and students from MET administrative science, actuarial sciences, and computer science departments
- Directed interdisciplinary research in collaboration with BU CAS Physics department

Senior Research Fellow, Dept of Physics, Boston University**,** *Boston, MA* — 9/2009 – Present
- Research areas: Econophysics, Complexity Science, Network Theory and Applications
- Research focus: (i) developing models and forecasting tools for global financial crisis; (ii) investigating endogenous and exogenous factors that contribute to cascading failures and systemic risk buildup in networks of financial institutions (iii) analyzing influences in coupled financial market networks and news sentiments

Research Assistant, Dept of Physics, Boston University, *Boston, MA* — 9/2005-8/2009
- Studied volatility return intervals of the S&P 500 index and two common models
- Investigated the relation between volatility in financial markets and Omori processes

Lecturer in Finance, Boston University, *Boston, MA* — 9/2002 – 9/2009
- Taught Investments and Portfolio Management at Metropolitan College and SMG
- Taught Financial Management and Capital Budgeting at Metropolitan College

Research Assistant, Owen GSM, Vanderbilt University, *Nashville, TN* — 9/1995 – 5/1996
- Researched privately-owned companies before their Initial Public Offerings (IPOs) and analyzed their profitability dynamics after they go public with Dr. Ronald Masulis, Frank K. Houston Professor of Management

Teaching Assistant, Owen GSM, Vanderbilt University, *Nashville, TN* — 9*/1995 – 5/1996*
- Served as teaching assistant for international monetary and fiscal policy course *with Dr. J. Dewey Daane, Frank K. Houston Professor of Finance, Emeritus and Senior Advisor, Financial Markets Research Center*

Select Administrative and 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

ASSOCIATE DIRECTOR FOR RESEARCH, CENTER FOR FINANCE, LAW, AND POLICY, BOSTON UNIVERSITY, *Boston, MA* — 4/2012 – 4/2013

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

MEMBER, STEERING COMMITTEE OF THE CENTER FOR FINANCE, LAW, AND POLICY, BOSTON UNIVERSITY, BOSTON, MA — 1/2011 – 4/2013

- Participated in the creation of the Center since its early conceptual phase
- Contributed to strengthening the research profile of the Center by including it in a major international research proposal submitted to the European Commission

DIRECTOR OF MAJOR GIFTS, DEVELOPMENT, NEW ENGLAND BAPTIST HOSPITAL, *Boston, MA* — *12/2006 – 4/2008*

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

MAJOR GIFTS OFFICER, UNIVERSITY DEVELOPMENT, BOSTON UNIVERSITY*, Boston, MA* — *9/2003 – 12/2006*

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

HEAD TRADER OF 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*., 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, Macedonia* — *9/1992 – 8/1994*

- Designed and developed variety of banking databases 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 of Interest

- Corporate governance networks: Identifying powerful directors in the US corporate governance network
- Volatility in financial markets and predictive power of VIX implied volatility index on the S&P 500 volatility
- Systemic risk modeling: Using bank balance sheet data approach to simulate toxic assets contribution to financial crisis propagation across the U.S. monetary landscape
- Interdependent network theory: Applications in modeling and studying complex financial and economic systems such as bank liquidity networks and financial market dynamics
- Quantitative analyses of global financial networks using complex principal component analyses, random matrix theory, correlation-based approaches, and community detection algorithms to assess the global financial landscape
- News analytics and financial time series: Investigating the relations between news sentiments and risk and return time series for global equities, foreign exchange, and international stock market indices
- Big data analytics and complex economic system analyses: Using datasets in order of magnitude of billions of data points including intraday (tick by tick) pricing and news streaming data to forecast financial market returns and future news sentiments
- European Sovereign debt crisis investigation and model development for detecting instabilities in bank-Government coupled (bi-partite) network

Service

Boston University

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

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)

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

Principal Investigator (PI) for Boston University on National Scientific 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
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
Owen Graduate School of Management Fellowship, Vanderbilt University	9/1995 – 5/1996
Alexander Hamilton Fulbright Fellowship	1994

Publications

Peer-reviewed journal articles

D. Y. Kenett, X. Huang, I. Vodenska, S. Havlin, H.E. Stanley, **Partial correlation analysis: Applications for financial markets,** arXiv preprint arXiv:1402.1405 *Journal of Quantitative Finance (preprint)* (2015).

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).

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)*

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).

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

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)

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)

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

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).

Refereed conference proceedings

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*

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*

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*

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

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*

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*

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*

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*

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)

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*

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*

Conference presentations

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*

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*

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*

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

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*

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*

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*

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*

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*

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*

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*

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*

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*

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*

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

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*

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*

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*

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

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*

Invited talks

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*

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*

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*

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*

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*

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*

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*

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*

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*

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*

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*

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*

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*

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

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*

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

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*

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

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

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*

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

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

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

Working papers

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 PNAS)*

I. Vodenska, H. Aoyama, Y. Fujiwara, H. Iyetomi, Y. Arai, H.E. Stanley, **Interconnectivities and causalities in complex financial networks** *(submitted to Econometrica)*

C. Curme, H.E. Stanley, and I. Vodenska, **Coupled network approach to predictability of financial market returns and news sentiments** (*submitted to International Journal of Theoretical and Applied Finance*)

A. Joseph, I. Vodenska, E. Stanley, and G. Chen, **"Multiple linear regression-fit networks of international trade and finance"** *(submitted to International Forecasting Journal)*

A. Majdandzic, L. Braunstein, I. Vodenska, S. Levy, S. Havlin, and H.E. Stanley, **Multi-stability in interconnected and interdependent dynamical networks with recovery** (*submitted to Nature Communications*)

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 Journal)*

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)*

A. Moullokandov, N. Dehmami, H.E. Stanley, I. Mozetic, P. Kralj, and I. Vodenska, **"Financial news sentiment structure and entity clustering"** *(to be submitted to Quantitative Finance)*

Y. Sakamoto and i. Vodenska, **Systemic risk propagation in bank-asset network: New perspective of the Japanese banking crisis of the 1990s,** *(to be submitted to the Journal of Complex Networks)*

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

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

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

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

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

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, ECB; Di Zhou, Bloomberg, L.P., Panos Argyrakis, University of Thessaloniki, Greece, Antonio Scala and Andrea Gabrielli, Center for Complex Systems, La Sapienza University, Italy, Tomislav Smuc and Vinko Zlatic, Rudjer Boshkovic Institute, Zagreb, Croatia, Igor Mozetic and Petra Kralj, Jozhef Shtefan Institute, Ljubljana, Slovenia, Hideaki Aoyama, Yoshi Fujiwara, Hiroshi Iyetomi, Yohei Sakamoto, and Yuta Arai, Japan
- PhD student co-advisor and PhD dissertation committee member for: **Xuqing Huang** (graduated in 2013), N**ima Dehmamy, Chester Curme** (graduated in 2015), **Adam Avakian, Asher Moullokandov, and Antonio Majdandzic** (expected graduation in 2015/2016)

Select Synergetic Activities

Interdisciplinary education, research, and financial industry certifications

- FORECASTING FINANCIAL CRISES INTERVIEW
- http://forecastingcrises.wordpress.com/2013/06/11/irena-vodenska-foc-project-we-need-financial-regulatory-reform/

- IN THE PRESS
- **Simons Foundation – Quanta Magazine: Illuminating Science**
- https://www.simonsfoundation.org/quanta/20130318-treading-softly-in-a-connected-world/

CERTIFICATIONS AND CHARTERS

- CFA Charter holder, 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

Languages

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