
Jonathan W. Welburn, PhD

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Education

Doctor of Philosophy, December 2016

University of Wisconsin-Madison, Madison, WI

Decision Science and Operations Research – Industrial & Systems Engineering

Minor: Economics, Focus: Risk Analysis and Economic Risk

Dissertation Title: Essays on Global Economic Risk

Advisor: Vicki M. Bier

Committee Members: Oghuzan Alagoz, Menzie Chinn, Kjell Hausken, Thomas Rutherford

Bachelors of Science, May 2010

University of Wisconsin-Madison, Madison, WI

Dual Major: Industrial & Systems Engineering and Economics – Math Emphasis

Certificate (Minor): Mathematics

Budapest University of Technology and Economics (BME), Budapest, Hungary

Semester Abroad, August 2008-January 2009

Mechanical Engineering

Research and Work Experience

- 2016– Associate Operations Researcher, RAND Corporation, Pittsburgh PA
- 2010–16 Graduate Research Fellow, Industrial & Systems Engineering, University of Wisconsin Madison, supervised by Professor Vicki Bier. (2010-Present)
Research projects include: global economic risk with a focus on economic contagion & financial crises and the statistical analysis of risks of imported food into the United States.
- 2013 Summer Associate, RAND Corporation, Santa Monica, CA. (June-September)
Led research on military supply chain risks from vendor financial distress. Modeled defense contractor default probability. Developed stochastic program to aid in policy directions of maximizing military readiness and minimizing disruption risk.
- 2012 Visiting Researcher, Department of Social Sciences, University of Stavanger, Stavanger, Norway, research supervised by Professor Kjell Hausken. (June-September)
Partnered in a research collaboration on the game-theoretic modeling of financial crises and contagion.
- 2010-11 Research Assistant (RA), Industrial & Systems Engineering, University of Wisconsin Madison, supervised by Professor Vicki Bier

Food Safety

Modeling of risk in the global food supply chain. Analysis of food safety risks of US food imports as country and product risks. Collaboration with the Center for World Affairs and the Global Economy in association with the Univ. of Wisconsin-Madison College of Engineering Center for Human Performance and Risk Analysis.

Gas and Liquid Pipelines

Research on risks from gas and liquid pipelines for the Wisconsin Office of Justice and the Department of Natural Resources.

- 2010 Undergraduate Research Assistant, Industrial & Systems Engineering, University of Wisconsin Madison, supervised by Professor Vicki Bier
Worked on research specific to analysis the safety risks attributed to food imports.
- 2007-09 Summer Intern, Lockheed Martin Space Systems Company, Sunnyvale, CA.
Risk Analysis, Enterprise Risk Management, Summer 2009
Developed models to calculate asset failure probability and forecast future asset failures. Use of stochastic and deterministic modeling for risk assessment and mitigation. Led team of software engineers for mitigation project.
- Risk Engineering**, Enterprise Risk Management, Summer 2008
Assisted in risk assessment and mitigation projects. Led database risk mitigation project, continuation of summer 2007 project.
- Risk Engineering**, Crane Risk Reduction, Summer 2007
Development enterprise wide database application for the mitigation of risks associated with crane use.
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Awards and Honors**Grants**

- 2012 National Science Foundation - Research Council of Norway Nordic Research Opportunity Grant (2012) Grant No. DGE-0718123 Funded Project: "Contagion or Common Cause? An Interdisciplinary Approach to Assessing the Dynamics of Global Systemic Risk." Research Collaborator: Kjell Hausken, University of Stavanger.

Major Fellowships and Scholarships

- 2011-15 Fellowship: National Science Foundation Graduate Research Fellow
2010-16 Fellowship: University of Wisconsin Graduate Engineering Research Scholars
2005-10 Scholarship: University of Wisconsin Chancellor's Scholar, 2005-2010

Awards

- 2015 Society for Risk Analysis (SRA) Economics and Benefits Specialty Group Student Merit Award
2014 SRA Decision Analysis and Risk Specialty Group Student Merit Award
2014 CAARMS20 Angela E. Grant Award for poster presentation, best algorithm
2012,14 SRA Student Travel Award
2012-15 INFORMS-MIF Travel Award
2014 NSF Travel Award for IIE Annual Conference 2014

2013	Industrial & Systems Engineering Department Graduate Student Travel Award
2012	Society for Risk Analysis Best Poster Award
2010	Robert A. Ratner Senior Design Award, 2nd Prize, UW Dpt. of Ind. & Syst. Engr.
2007	Emerging Student Leader Award, University of Wisconsin – Madison MSC

Minor Scholarships

2005-10	University of Wisconsin-Madison College of Engineering LEED Scholar
2005	Tucson Alumni Club Scholarship, and College Board AP Scholar with Honor

Publications and Presentations

In Progress

Understanding the Channels of Contagion Through a Borrower-Lender Game. Jonathan W. Welburn.

Army Supply Chain Risks From Vendor Financial Distress. Jonathan W. Welburn.

Published Papers & Technical Reports

Import Security: Assessing the Risks of Imported Food. Jonathan W. Welburn, Vicki M. Bier, Steven Q. Hoerning. *Risk Analysis*. January, 2016. Vol. 36, No. 11.

Game Theoretic Modeling of Economic Systems and the European Debt Crisis. Jonathan W. Welburn and Kjell Hausken. *Computational Economics*. December, 2015.

A Game Theoretic Model of Economic Crises. Jonathan W. Welburn and Kjell Hausken. *Applied Mathematics and Computation*. September, 2015. Vol 266, pp 738-762.

Wisconsin Pipeline Information Synthesis. Vicki M. Bier, Theresa M. Adams, Jonathan W. Welburn, Andrew J. Lindquist. Study for Wisconsin Office of Justice Assistance funded by the Department of Homeland Security. January 2012.

Presentations and Posters

1. Economic Contagion And The Role Of Beliefs: Findings From A Borrower-lender Game. Jonathan W. Welburn. *INFORMS 2015. Oral Presentation.*
2. Import Security: Assessing the Risks of Imported Food. Jonathan W. Welburn, Vicki M. Bier, Steven Q. Hoerning. *INFORMS 2015. Oral Presentation.*
3. Contagion. Jonathan Welburn. *INFORMS Minority Issues Forum (MIF) Poster Session, INFORMS 2015. Poster Presentation.*
4. Models of Economic Contagion. Jonathan Welburn, Vicki Bier, and Kjell Hausken. *Purdue Perspective Faculty Workshop, 2015. Poster Presentation.*
5. Understanding the Channels of Contagion: A Game between Borrower and Lender Countries. Jonathan Welburn, Vicki Bier, and Kjell Hausken. *Society for Risk Analysis (SRA) 2014. Poster Presentation.*
6. Understanding the Channels of Contagion: A Game between Borrower and Lender Countries. Jonathan Welburn, Vicki Bier, and Kjell Hausken. *INFORMS 2014. Oral Presentation.*
7. Understanding the Channels of Contagion: A Game between Borrower and Lender Countries. Jonathan Welburn, Vicki Bier, and Kjell Hausken. *INFORMS Minority Issues Forum (MIF) Poster Session, INFORMS 2014. Poster Presentation.*
8. A Game Theoretic Model of Financial Crises. Jonathan W. Welburn and Kjell Hausken. *Advances in Decision Analysis 2014. Presentation of Paper to Research Incubator.*

9. A Game-theoretic Model of Economic Contagion. Jonathan W. Welburn and Kjell Hausken. CAARMS20 2014. *Poster Presentation*. Received Angela E Grant Award for best algorithm.
10. A Game-theoretic Model of Economic Contagion. Jonathan W. Welburn and Kjell Hausken. ISERC 2014. *Oral Presentation*.
11. Quantifying and Modeling Risks of Food Imports. Jonathan W. Welburn, Vicki M. Bier, Steven Q. Hoerning. INFORMS 2013. *Oral Presentation*.
12. A Game Theoretic Model of Financial Crises. Jonathan W. Welburn and Kjell Hausken. INFORMS 2013. *Oral Presentation*.
13. A Game Theoretic Model of Financial Crises .Jonathan W. Welburn and Kjell Hausken. INFORMS Minority Issues Forum (MIF) Poster Session, INFORMS 2013. *Poster Presentation*. Awarded Honorable Mention.
14. Import Security: Assessing the Risks of Imported Food. Jonathan W. Welburn, Vicki M. Bier, Steven Q. Hoerning. ISERC 2013. *Poster Presentation*.
15. Import Security: Assessing the Risks of Imported Food. Jonathan W. Welburn, Vicki M. Bier, Steven Q. Hoerning. SRA 2012. *Poster Presentation*. Awarded SRA Best Poster Award.
16. A Game Theoretic Model of Financial Contagion and Global Economic Risks. Jonathan W. Welburn, Kjell Hausken. INFORMS-MIF Poster Session, 2012. *Poster Presentation*. Awarded Semifinalist.
17. Analysis of Food Import Refusals as a Key Indicator of Risk for Food Safety. Jonathan W. Welburn, Vicki M. Bier, Steven Q. Hoerning. INFORMS-MIF Poster Session, INFORMS 2012. *Poster Presentation*.
18. Import Security: Assessing the Risks of Imported Food. Jonathan W. Welburn, Vicki M. Bier, Steven Q. Hoerning. INFORMS 2012. *Oral Presentation*.
19. Observations from OASIS Violations Data for Border Inspection. Jonathan Welburn, Vicki M. Bier, Steven Hoerning. Production and Operations Management Society (POMS), Chicago, IL, 4/21/2012, *Oral Presentation*.
20. Import Security: Analyzing the risks of imported food. Jonathan Welburn, Vicki M. Bier, Steven Hoerning. Graduate Engineering Research Scholars/ Science-Medicine Poster Session, Madison, WI, 4/26/2012, *Poster Presentation*.
21. Observations from OASIS Violations Data for Border Inspection. Jonathan W. Welburn, Vicki M. Bier. World Affairs in the Global Economy: Achieving Safety in the Global Food Supply Chain – Integrating Science and Policy. April 28, 2011. *Oral Presentation*.

Teaching

**All teaching experiences are at the University of Wisconsin-Madison.*

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| 2014-15 | Lecturer, Department of Industrial & Systems Engineering, (Summer Session) <i>Engineering Economics Analysis (ISyE 313)</i> . <i>Led lecture, developed syllabus, homework, and exams.</i> |
| 2010 | Teaching Assistant (TA), Department of Industrial & Systems Engineering, (Fall) <i>TA for Engineering Economic Analysis</i> . <i>Created lessons plans and facilitate discussion sections. Held office hours to assist students. Develop and grade exam questions.</i> |
| 2009-10 | Academic Coach/ Tutor, Center for Center for Educational Opportunity (CEO), (November 2009-May 2010) |

- 2006 Tutor / Academic Coach for courses in Industrial Engineering and Economics Counselor, Engineering Summer Program (ESP), (Summer)
Residential Counselor for the Engineering Summer Program. Led teaching and discussion sections. Mentor students.

Research Mentorship of Undergraduate Students

Undergraduate students

Anne Velazquez, Fall 2015-Spring 2016

Economic contagion. (Co-advised with Vicki M. Bier)

Brian Zhou, Fall 2014-Spring 2015

Economic contagion. (Co-advised with Vicki M. Bier)

Jie Wu, Fall 2013-Spring 2015

Analysis of food import security (co-advised with Vicki M. Bier). Jie is currently a PhD student at Georgia Tech University.

Steven Q. Hoerning, Fall 2011-Spring 2013

Analysis of food import security (co-advised with Vicki M. Bier). Steven is currently a PhD student at Stanford University.

Summer Undergraduate Research Program

Victor O Rivera Rodriguez, Summer 2015

Economic contagion (co-advised with Vicki M. Bier).

Solon Thomaz Ferreira, Summer 2015

Analysis of risks to imported foods from economically motivated adulteration (co-advised with Vicki M. Bier).

Isabelle Amorim Gomes, Summer 2014

Economic contagion (co-advised with Vicki M. Bier).

Eulisa Rivera, Summer 2011

Analysis of risks for imported foods (co-advised with Vicki M. Bier). Eulisa is currently a graduate student at the University of Pittsburgh.

Service & Community Outreach

- 2015 Judge for IIE regional conference undergraduate paper competition.
- 2014-15 Science Night at Nuestro Mundo elementary school. Contributed to science experiments with group of graduate students.
- 2013 UW-Madison Engineering Expo. Led "Operations Research Games" exhibit to demonstrate simulation and optimization through games to local middle school and high school students promoting the use of math in decision making.
- 2011 UW-Madison Engineering Expo. Participated in hands-on exhibit explaining the science of non-Newtonian fluids to local middle school and high school students.
- 2010-14 Graduate student mentor to UW-Madison Federal Reserve Challenge Team.

Organizations

Leadership positions held

- 2011-15 *Society for Mathematical Finance*. Univ. of Wisconsin, founder, Co-President.
 2007-10 *Federal Reserve Challenge*, (monetary policy presentation to Federal Reserve).
 Chairman 2009-2010 and Vice Chairman for International Econ 2009 at the Univ. of
 Wisconsin-Madison
 2005-10 *National Society of Black Engineers / Wisconsin Black Engineers Student Society*,
 Chapter President 2007-08, First Vice President, 2006-07; Membership Chair, 2005-
 06 at the Univ. of Wisconsin-Madison

General member

- *Society for Risk Analysis (SRA)*, student member
- *Institute for Operations Research (INFORMS)*, student member
- *Institute for Industrial Engineering (IIE)*, student member
- *Production and Operations Management Society (POMS)*, student member

Coursework

Relevant Graduate Coursework

- Operations Research: Stochastic Processes, Simulation & Modeling, Stochastic Programming,
 Optimization with GAMS, Risk Analysis, Decision Analysis.
 Economics: Micro, Macro, Econometrics, Time Series, Open Economy (International)
 Macroeconomics, Game Theory.
 Finance: Derivative Securities, Fixed Income Analysis.
 Statistics: Mathematical Statistics, Bayesian Statistics, Rare event
 approximation/Extreme Value Theory.

Course Projects

- 2013 Contagion causation with Granger-causality. Time Series.
 2011 Modeling risk in the food supply chain. Risk Analysis.
 2010 Risk Management for Wartburg College. Financial Risk. Tuition Pricing,
 2010 Tax-Aware Portfolio Modeling. Nonlinear Optimization.
 2009 Competitive Analysis for Maverick Wine Gifts - A Swiss Colony Company.
 2009 Process Improvement at University of Wisconsin Libraries.
 2008 Portfolio Selection. Linear Programming.

Additional Skills & Expertise

- Intermediate French reading/writing/speaking ability
- Computer skills in GAMS, R, STATA, Mathematica, Tableau, MATLAB, MS Excel for data analysis, VBA, Bloomberg Software, and MS Access