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EDUCATION

- 1988: Ph.D., Economics, The Johns Hopkins University
1987: M.A., Economics, The Johns Hopkins University
1984: B.S., Operations Research & Information Engineering, Cornell University

PRINCIPAL ACADEMIC APPOINTMENTS

- 2024-Present: Professor *Emeritus* of Economics, College of Business, Cleveland State University
2004-2024: Professor of Economics, College of Business, Cleveland State University
1989-2024: Graduate Faculty, Cleveland State University
2018-2019: Associate Dean, College of Liberal Arts and Social Sciences, Cleveland State University
2015-2018: Director, Master of Arts in Economics Program, Cleveland State University
2004-2015: Chairman, Department of Economics, Cleveland State University
1993-2004: Associate Professor, Department of Economics, Cleveland State University
1988-1993: Assistant Professor, Department of Economics, Cleveland State University

SHORTER-TERM ACADEMIC APPOINTMENTS

- 1-6/1999: Visiting Associate Professor, Owen Graduate School of Management, Vanderbilt University
1-6/1995: Visiting Associate Professor, Department of Economics, The Johns Hopkins University

RESEARCH AREAS

Agent-Based Modelling, Computational Economics, Epidemiology, Industrial Organization, Industry Dynamics, Microeconomic Theory, Modeling Social and Behavioral Dynamics, Organization Theory

RESEARCH GRANTS AND AWARDS

- 2020-2022: Faculty Scholarship Initiative Grant for *Learning to Vaccinate: Endogenous Vaccination and the Dynamics of Infectious Disease*, Cleveland State University
2008-2011: Faculty Research Development Grant for *A Computational Model of Industry Evolution*, Cleveland State University

- 2000-2002: National Science Foundation Research Grant (SES-0078752) for *Computational Modeling of Multi-Level/Multi-Unit Organizations*, Co-Principal Investigator (joint with Joseph E. Harrington, Jr.)
- 1989-1990: Research and Creative Activities Grant for *Exclusive Dealing Contracts and Market Foreclosure*, Cleveland State University
- 6-8/1989: Research Challenge Grant, Cleveland State University

PUBLICATIONS

Book

- 2015 *A Computational Model of Industry Dynamics*. London: Routledge, 2015.

Articles

- 2026 “Theory-Building in Organizational Science with Agent-Based Computational Models: Past, Present, and Future” in: Friederike Wall, Shu-Heng Chen, and Stephan Leitner, eds., *Oxford Handbook of Agent-Based Computational Management Science*, New York: Oxford University Press, forthcoming. Online version available at: <<https://doi.org/10.1093/oxfordhb/9780197668122.013.9>>.
- 2023 “Spatial Disparities in Vaccination and the Risk of Infection in a Multi-Region Agent-Based Model of Epidemic Dynamics” (with Troy Tassier), *Journal of Artificial Societies and Social Simulation* 26 (3) 3 <<http://jasss.soc.surrey.ac.uk/26/3/3.html>>. doi: 10.18564/jasss.5095.
- 2023 “It’s Worth a Shot: Urban Density, Endogenous Vaccination Decisions, and Dynamics of Infectious Disease” (with Andrew Souther and Troy Tassier), *Journal of Economic Interaction and Coordination*, 18 (2023), 163-189.
- 2021 “Spatially Heterogeneous Vaccine Coverage and Externalities in a Computational Model of Epidemics” (with Troy Tassier), *Computational Economics*, 58 (2021), 27-55.
- 2020 “A Dynamic Computational Model of Social Stigma” (with Joseph E. Harrington, Jr.), *Journal of Artificial Societies and Social Simulation*, 23 (2), 1 <<https://www.jasss.org/23/2/1.html>>. doi: 10.18564/jasss.4225.
- 2018 “Computational Industrial Economics: A Generative Approach to Dynamic Analysis in Industrial Organization,” in: Shu-Heng Chen, Mak Kaboudan, and Ye-Rong Du, eds., *Oxford Handbook of Computational Economics and Finance*, New York: Oxford University Press, 2018, 594-634.
- 2015 “Competition Policy,” in: David J. Teece and Mie Augier, eds., *The Palgrave Encyclopedia of Strategic Management*, London: Palgrave Macmillan, 2015.

- 2015 “When Can We Expect a Corporate Leniency Program to Result in Fewer Cartels?” (with Joseph E. Harrington, Jr.), *Journal of Law and Economics*, 58 (2015), 417-449.
- 2013 “Individual Learning and Social Learning: Endogenous Division of Cognitive Labor in a Population of Co-evolving Problem-Solvers,” (with Joseph E. Harrington, Jr.), *Administrative Sciences*, 3 (2013), 53-75 [Special issue on *Computational Organization Theory*]
- 2011 “Emergent Social Learning Networks in Organizations with Heterogeneous Agents,” *Advances in Complex Systems*, 14 (2011), 169-199
- 2011 “Entry, Exit, and the Endogenous Market Structure in Technologically Turbulent Industries,” *Eastern Economic Journal*, 37 (2011), 51-84 [Symposium Issue on *Agent-Based Computational Economics*]
- 2011 “Agent-Based Modeling and Computational Experiments in Industrial Organization: Growing Firms and Industries *in silico*,” *Eastern Economic Journal*, 37 (2011), 28-34 [Symposium Issue on *Agent-Based Computational Economics*]
- 2009 “Modeling the Birth and Death of Cartels with an Application to Evaluating Competition Policy,” (with Joseph E. Harrington, Jr.), *Journal of the European Economic Association*, 7 (2009), 1400-1435
- 2009 “Industry Dynamics with Knowledge-Based Competition: A Computational Study of Entry and Exit Patterns,” *Journal of Economic Interaction and Coordination*, 4 (2009), 73-114
- 2007 “Innovators, Imitators, and the Evolving Architecture of Problem-Solving Networks,” (with Joseph E. Harrington, Jr.), *Organization Science*, 18 (2007), 648-666
- 2007 “Decentralization,” in: Stewart Clegg and James R. Bailey, editors, *International Encyclopedia of Organization Studies*, Volume 1, SAGE Publications, Thousand Oaks, CA, 2007, 359-362
- 2006 “Agent-Based Models of Organizations,” (with Joseph E. Harrington, Jr.), in: Leigh Tesfatsion and Kenneth L. Judd, eds., *Handbook of Computational Economics II: Agent-Based Computational Economics*, Elsevier, 2006, 1273-1337
- 2005 “Discovery and Diffusion of Knowledge in an Endogenous Social Network,” (with Joseph E. Harrington, Jr.), *American Journal of Sociology*, 110 (2005), 937-976

- 2005 "Co-Evolution of Firms and Consumers and the Implications for Market Dominance," (with Joseph E. Harrington, Jr.), *Journal of Economic Dynamics and Control*, 29 (2005), 245-276
- 2004 "Organization of Innovation in a Multi-Unit Firm: Coordinating Adaptive Search on Multiple Rugged Landscapes," (with Joseph E. Harrington, Jr.), in: William Barnett, Christophe Deissenberg, and Gustav Feichtinger, editors, *Economic Complexity: Non-linear Dynamics, Multi-agents Economies, and Learning*, International Symposia on Economic Theory and Econometrics, Vol. 14, 2004, Elsevier, Amsterdam, 189-214
- 2003 "Multi-Market Competition, Consumer Search, and the Organizational Structure of Multi-Unit Firms," (with Joseph E. Harrington, Jr.), *Management Science*, 49 (2003), 541-552
- 2002 "Decentralized Business Strategies in a Multi-Unit Firm," (with Joseph E. Harrington, Jr.), *Annals of Operations Research*, 109 (2002), 77-98
- 2000 "Centralization vs. Decentralization in a Multi-Unit Organization: A Computational Model of a Retail Chain as a Multi-Agent Adaptive System," (with Joseph E. Harrington, Jr.), *Management Science*, 46 (2000), 1427-1440
- 1998 "Product Switching Cost and Strategic Flexibility," *Journal of Economics and Management Strategy*, 7 (1998), 461-488
- 1997 "Organizational Structure and Firm Innovation in a Retail Chain," (with Joseph E. Harrington, Jr.), *Computational and Mathematical Organization Theory*, 3 (1997), 267-288
- 1996 "The Interactive Effect of Product Differentiation and Cost Variability on Profit," (with Joseph E. Harrington, Jr.), *Journal of Economics and Management Strategy*, 5 (1996), 175-193
- 1993 "Flexible Manufacturing, Uncertain Consumer Tastes, and Strategic Entry Deterrence," *Journal of Industrial Economics*, XLI (1993), 77-90
- 1992 "Inter-temporal Product Choice and Its Effects on Collusive Firm Behavior," *International Economic Review*, 33 (1992), 773-793
- 1992 "Exclusive Dealing Contracts in a Successive Duopoly with Side Payments," *Southern Economic Journal*, 59 (1992), 180-193
- 1991 "The Effects of Product Differentiation on Collusive Pricing," *International Journal of Industrial Organization*, 9 (1991), 453-469

- 1988 "The Effects of Irreversible Investment in Durable Capacity on the Incentive for Horizontal Merger," (with Joseph E. Harrington, Jr.), *Southern Economic Journal*, 55 (1988), 443-453

Book reviews

- 2013 Review of *Game Theory: A Nontechnical Introduction to the Analysis of Strategy* by Roger A. McCain, *Eastern Economic Journal*, 39 (2013), 267-269

WORKING PAPERS

- 2026 "Learning to Vaccinate: Bounded-Rational Decisions, Networked Contagion, and Social Dilemmas in a Spatiotemporal Epidemic Model" (with Troy Tassier), January 2026
- 2015 "A Non-Equilibrium Theory of Merger Waves," April 2015
- 2012 "A Note on the Dynamics of Firm Turnovers in the East Liverpool (Ohio) Pottery Industry, 1825-2010," May 2012
- 2010 "The Impact of a Corporate Leniency Program on Antitrust Enforcement and Cartelization" (with Joseph E. Harrington, Jr.), February 2009 [Revised: April 2010]
- 2007 "Partition and Delegate: A Computational Algorithm for Generating Nested Organizational Hierarchies with a Fixed Number of Tasks," June 2007
- 2001 "Co-Evolution of Firms and Consumers and the Implications for Market Dominance," (with Joseph E. Harrington, Jr.), *Center on Social and Economic Dynamics Working Paper Series No. 23*, The Brookings Institution, October 2001
- 2000 "Centralization vs. Decentralization in a Multi-Unit Organization: A Computational Model of a Retail Chain as a Multi-Agent Adaptive System," (with Joseph E. Harrington, Jr.), *Santa Fe Institute Working Paper 00-02-010*, 2000

TEACHING EXPERIENCE

1988-Present: Cleveland State University

Industrial Organization (BA)
Principles of Microeconomics (BA)
Intermediate Microeconomics (BA)
Public Regulation of Business (BA)
Managerial Economics (BA)
Game Theory & Business Strategy (BA)

Game Theory and Social Science (BA, Honors)
Game Theory and Strategic Behavior (BA)
Industrial Organization (MA)
Competition & Strategy (MA)
Economic Concepts (MBA)
Microeconomics (MBA)
Managerial Economics (MBA)

1999: Vanderbilt University (Owen Graduate School of Management)

Game Theory & Business Strategy (MBA)

1995: Johns Hopkins University

Elements of Microeconomics (BA)
Economics of Regulation (BA)

PROFESSIONAL ACTIVITIES

Editorial Positions

- 2016-Present: Member, Advisory Board, *Preprints* (MDPI)
2015-Present: Member, Editorial Board, *Administrative Sciences* (MDPI)
2012-2014: Guest Editor, Special Issue on “Computational Organization Theory,”
Administrative Sciences

Referee/Reviewer Activities

- Journals: *Administrative Sciences*, *American Economic Review*, *American Journal of Sociology*, *Annals of Operations Research*, *Bulletin of Economic Research*, *Canadian Journal of Economics*, *Central European Journal of Operations Research*, *Computational Economics*, *Computational Management Science*, *Computational and Mathematical Organization Theory*, *Computers in Biology and Medicine*, *Eastern Economic Journal*, *Ecology and Society*, *Economic Journal*, *Economic Inquiry*, *Economic Theory*, *Economics Letters*, *European Economic Review*, *Economics (e-journal)*, *International Economic Review*, *International Journal of Industrial Organization*, *Journal of Artificial Societies and Social Simulation*, *Journal of Economic Behavior and Organization*, *Journal of Economic Dynamics and Control*, *Journal of Economic Interaction and Coordination*, *Journal of Economics and Business*, *Journal of Economics and Management Strategy*, *Journal of Economic Theory*, *Journal of Industrial Economics*, *Management Science*, *Managerial and Decision Economics*, *Marketing Science*, *Metroeconomica*, *New Mathematics and Natural Computation*, *Organization Science*, *Quarterly Journal of Business and Economics*, *RAND Journal of Economics*, *Review of Economic Studies*, *Review of Industrial Organization*, *Scandinavian Journal of Economics*, *Southern Economic Journal*, *Strategy Science*, *Zeitschrift Für Nationalökonomie*

Publishers: Addison Wesley Longman, Cambridge University Press, Harper Collins Publishers, John Wiley & Sons, Inc., Johns Hopkins University Press, MIT Press, Prentice Hall, Routledge, Stanford University Press, W. W. Norton & Company

Foundations: Israel Science Foundation (Israel)
National Science Foundation (USA)