

*“74 percent [of people] hate their job in America. Now, there’s not much different when you come to Europe: the majority of people don’t like what they’re doing [...]. So if you think about [it,] only a quarter of the people really enjoy what they’re doing in life! That is **unbelievable** if you think about it.”*

—Arnold Schwarzenegger, excerpt from *The Speech That Broke the Internet* (2018).

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CITIZENSHIP.

- United States of America (born in Oak Park, Illinois).

UNIVERSITY DEGREES AND QUALIFICATIONS.

4. Doctor of Philosophy in Economics, University of Minnesota (Minneapolis), Spring 2017.
Dissertation Title: Essays on Universal Portfolios.
Dissertation Committee: Aldo Rustichini (Thesis Advisor), David Rahman (Co-Advisor), Jan Werner (Dissertation Reviewer), Terry Roe (Outside Examiner for Thesis Defense), Hengjie Ai (Outside Examiner for Prelim Oral).
3. Master of Science in Economics, University of Minnesota (Minneapolis), Fall 2015.
2. Master of Science in Pure Mathematics, Northern Illinois University, Summer 2011.
1. Bachelor of Science in Pure Mathematics, Northern Illinois University, Spring 2010.

ACADEMIC APPOINTMENT.

- Assistant Professor of Economics, School of Public and Global Affairs, College of Liberal Arts and Sciences, Northern Illinois University (August 2017-present).
- **Research Interests:** Quantitative Finance; Financial Engineering; Decision Theory and Robust Procedures; Financial Intermediation; Financial Econometrics; Algorithmic Trading; Computational Finance; Financial Machine Learning.

- ★ ORCID-iD: <https://orcid.org/0000-0003-0944-8517>.
- ★ ArXiv Author Identifier: https://arxiv.org/a/garivaltis_a_1.html.
- ★ Google Scholar: <https://scholar.google.com/citations?user=-IBnWNcAAAAJ>.
- ★ ResearchGate: https://www.researchgate.net/profile/Alex_Garivaltis2.

■ **Teaching Specialties:** Intermediate Microeconomics; Sports Economics; Optimal Portfolio Choice; Research Tools & Methods.

TEACHING PORTFOLIO AND INSTRUCTIONAL EXPERIENCE.

7. ECON 647: Optimal Portfolio Choice (Spring 2019).
6. ECON 649: Algorithmic Trading (Spring 2020).
5. ECON 691: Research Tools for Economists (team-taught: Fall 2020, Fall 2019).
4. ECON 315: Sports Economics (Spring 2020, Spring 2019).
3. ECON 492: Research Methods in Economics (Instructor: Spring 2018. Guest Lecturer: Fall 2020, Fall 2019).
2. ECON 360: Intermediate Microeconomics and ECON 664: A Survey of Market Economics (Fall 2020, Fall 2019, Fall 2018, Fall 2017).
1. Major Project Seminar; Introduction to Econometrics; Principles of Econometrics; Principles of Macroeconomics; Principles of Microeconomics; Intermediate Microeconomics (University of Minnesota Department of Economics, Fall 2012-Spring 2017).

CURRICULAR DESIGN & DEVELOPMENT.

- Developed original content and assessments for a new course in Sports Economics (ECON 315, the first such course in university history) in partnership with Carl Campbell (Department Chair, Economics) and Jeremy Groves (Director of Graduate Studies, Economics). According to research by Brad Humphreys *et al.* (2015), only 17.2% of U.S. liberal arts colleges and 29.5% of U.S. research universities offer undergraduate electives in Sports Economics.

RESEARCH ARTICLES PUBLISHED IN PEER-REVIEWED JOURNALS.

7. GARIVALTIS, A., 2019. Exact Replication of the Best Rebalancing Rule in Hindsight. *The Journal of Derivatives*, 26(4), pp.35-53. doi: <https://doi.org/10.3905/jod.2019.26.4.035>.
6. GARIVALTIS, A., 2019. Two Resolutions of the Margin Loan Pricing Puzzle. *Research in Economics*, 73(2), pp.199-207. doi: <https://doi.org/10.1016/j.rie.2019.04.006>.

5. GARIVALTIS, A., 2019. Game-Theoretic Optimal Portfolios in Continuous Time. *Economic Theory Bulletin*, 7(2), pp.235-243. doi: <https://doi.org/10.1007/s40505-018-0156-5>.
4. GARIVALTIS, A., 2019. Nash Bargaining Over Margin Loans to Kelly Gamblers. *Risks*, 7(3), 93. doi: <https://doi.org/10.3390/risks7030093>.
3. GARIVALTIS, A., 2019. The Laws of Motion of the Broker Call Rate in the United States. *International Journal of Financial Studies*, 7(4), 56. doi: <https://doi.org/10.3390/ijfs7040056>.
2. GARIVALTIS, A., 2019. Game-Theoretic Optimal Portfolios for Jump Diffusions. *Games*, 10(1), 8. doi: <https://doi.org/10.3390/g10010008>.
1. GARIVALTIS, A., 2019. Super-Replication of the Best Pairs Trade in Hindsight. *Cogent Economics & Finance*, 7(1), 1568657. doi: <https://doi.org/10.1080/23322039.2019.1568657>.

RESEARCH ARTICLES SUBMITTED TO PEER-REVIEWED JOURNALS.

5. Cover's Rebalancing Option with Discrete Hindsight Optimization (Revise & Resubmit at *Journal of Asset Management*).
4. Long Run Feedback in the Broker Call Money Market (Under Review).
3. A Note on Universal Bilinear Portfolios (Under Review).
2. Multilinear Superhedging of Lookback Options (Under Review).
1. How to Beat the Market Asymptotically (by Superhedging a Lookback Derivative) (Under Review).

SOLO-AUTHORED RESEARCH PAPERS IN PREPARATION.

- “The Geometry of Historical Stock Prices.”
- “Kelly Betting on Hidden Markov Models of the Stock Market.”
- “[REDACTED].”

RESEARCH GRANTS AND SUPPORT.

- Open Access Publishing Grant, N.I.U. Open Access Publishing Fund, University Libraries and the Division of Research and Innovation Partnerships, College of Liberal Arts and Sciences (1,021.42 USD to support *Nash Bargaining Over Margin Loans to Kelly Gamblers*, Fall 2019).
- Subsidy for Open-Access Article Publishing Charge, The Knowledge Unlatched Initiative (1,000 CHF to support *Game-Theoretic Optimal Portfolios for Jump Diffusions*, Spring 2019).

- Open Access Publishing Grant, N.I.U. Open Access Publishing Fund, University Libraries and the Division of Research and Innovation Partnerships, College of Liberal Arts and Sciences (1,350 USD to support *Super-Replication of the Best Pairs Trade in Hindsight*, Fall 2018).

AWARDS AND HONORS.

- Maplesoft® Maple Ambassador Program (2018-present).
- Distinguished Teaching Award, Department of Economics, University of Minnesota (2013-2015).
- College of Liberal Arts Graduate Fellowship, Department of Economics, University of Minnesota (Fall 2012-Spring 2013).

PROFESSIONAL SEMINARS AND CONFERENCES.

9. University of Wisconsin-Milwaukee, Economics Department Seminar (Invited Speaker, Fall 2019).
8. N.I.U. Economics Seminar Series: Exact Replication of the Best Rebalancing Rule in Hindsight (Speaker, Fall 2018).
7. University of Manchester, Inaugural Conference, Centre for Mathematical Research in Economics and Finance (Invited Speaker, Summer 2017).
6. Seventeenth Conference on Current Trends in Economics, Society for the Advancement of Economic Theory, Faro, Portugal (Invited Speaker, Summer 2017).
5. North American Summer Meeting of the Econometric Society (Invited Speaker, Summer 2017).
4. Yale University, Thirteenth Annual Cowles Foundation Conference on General Equilibrium Theory and its Applications (Discussant, Spring 2017).
3. Job Market Seminar, Department of Economics, Northern Illinois University (Invited Speaker, Spring 2017).
2. Job Market Seminar, University of Glasgow, Adam Smith Business School (Invited Speaker, Spring 2017).
1. Annual Meeting of the American Economic Association (AEA), Chicago, Illinois (Participant and Job Market Candidate, Spring 2017).

PROFESSIONAL SERVICE AND COMMITTEE WORK.

- Graduate Committee (August 2018-present).
- Graduate Colloquium Committee/Economics Department Seminar Coordinator (August 2018-present). Facilitation of travel accommodations, meals, and honoraria for seminar speakers and visitors to the N.I.U. Economics Department.
- Library Committee/Economics Library Representative (August 2017-present).
- Mock Interviews of N.I.U. Economics job market candidates (Fall 2019, Fall 2018, Fall 2017).
- Thesis review and troubleshooting for N.I.U. Economics Ph.D. students (Shawn Osell [Spring 2018], Masud Alam [Spring 2019])

STUDENTS.

10. Haritima Chauhan, Doctor of Philosophy in Economics (Spring 2018).
Initial Placement: Assistant Professor, Department of Economics & Decision Sciences, Western Illinois University, Macomb, Illinois.
Dissertation Title: Sentiments and Asset Markets.
9. Alexander Esche, Master of Science in Computational Mathematics (Fall 2017).
Initial Placement: Actuarial Assistant at CNO Financial Group, Indianapolis, Indiana.
Dissertation Title: Mathematical Programming and Magic: The Gathering[®].
8. Shawn Osell, Ph.D. work in Economics (Fall 2017-Spring 2018).
Initial Placement: Assistant Professor of Economics at Clarkson University, Potsdam, New York.
Dissertation Title: Interest on Excess Reserves in a DSGE Model with a Banking Sector.
7. Milivoje (“Mickey”) Davidovic, Research Assistant and Teaching Assistant for ECON 315: Sports Economics (Spring 2019). Winner of the N.I.U. Outstanding Graduate Student Award.
6. Kim Ferguson, Research Assistant and Teaching Assistant for ECON 360: Intermediate Microeconomics and ECON 315: Sports Economics (Fall 2018-present).
5. Godwin Ekpe, Research Assistant and Teaching Assistant for ECON 360: Intermediate Microeconomics (Fall 2017).
4. Michael Yurkiv, University Honors. In-course honors contract for ECON 315: Sports Economics (Spring 2019).
3. Letters of reference for **Patrick V. Campobasso-Jarvis** (ECON 360: Intermediate Microeconomics, Fall 2017). *First Position:* B.S. program in Financial Mathematics and Financial Economics, DePaul University.

2. Letters of reference for **Yue Liu** (ECON 360: Intermediate Microeconomics, Fall 2017). **First Position:** Master's program in Risk Management, Columbia University in the City of New York.
1. Letters of reference for **Wiktor Staszak** (ECON 360: Intermediate Microeconomics [Fall 2017] and ECON 315: Sports Economics [Spring 2019]). **First Position:** M.S. program in Economics, Northern Illinois University.

AFFILIATIONS AND PROFESSIONAL MEMBERSHIPS.

- Econometric Society; Bachelier Finance Society; American Economic Association; Midwest Economics Association; Illinois Economic Association; Society for the Advancement of Economic Theory.

JOURNAL EDITORIAL ACTIVITY.

- **Member of the editorial board, *International Journal of Financial Studies (IJFS)*.**
- **Editor of the *Special Issue on Leveraged, Inverse, and Specialty ETFs*.**

JOURNAL REFEREE ACTIVITY.

- *The Journal of Derivatives (JoD)*; *Managerial & Decision Economics*; *Risks*; *Economies*; *International Journal of Financial Studies (IJFS)*; *Operational Research: an International Journal*.

TECHNICAL SKILLS AND EXPERIENCE.

- MATLAB; Mathematica; Maple; MuPAD; Stata/Mata; C/C++; Java; Python; L^AT_EX; Beamer; HTML/CSS; Hansl; Gretl; Windows PowerShell; Microsoft Word; Microsoft Excel; Microsoft PowerPoint; Microsoft Outlook; Data Analysis ToolPak for Microsoft Excel; Dynare; EViews; SPSS; Minitab; gnuplot; Trader Workstation (Interactive Brokers).

HOBBIES AND HUMAN INTEREST.

Chess (rated 2000+ on the Free Internet Chess Server [FICS] as of Summer 2019); Equity and option trading; Leveraged ETFs; Value investing; Bogleheads[®] investment forum; Tax loss harvesting; Cooking (mostly grill, broiler, and cast iron); Espresso-making and consumption; Computer games (e.g. *Counter-Strike: Global Offensive*, *Metro 2033*, and *Metro: Last Light*). TV Series (e.g. *The Sopranos*, *Mad Men*, *Breaking Bad*, and *Mr. Robot*); Raspberry Pi; BitTorrent and P2P; Hiking; Mediterranean travel.

ACADEMIC REFERENCES.

- Aldo Rustichini (Thesis Advisor)
Professor of Economics
University of Minnesota, Minneapolis
E-Mail: aldo.rustichini@gmail.com.
Telephone: +1 (612) 625-4816.
Home Page: <https://sites.google.com/site/aldorustichini/>.

- David Rahman (Co-Advisor)
Associate Professor of Economics
University of Minnesota, Minneapolis
E-Mail: dmr@umn.edu.
Telephone: +1 (612) 625-3525.
Home Page: <https://sites.google.com/site/davidrahmanwork/>.

- Jan Werner (Dissertation Reviewer)
Professor of Economics
University of Minnesota, Minneapolis
E-Mail: jwerner@umn.edu.
Telephone: +1 (612) 625-0708.
Home Page: <https://users.econ.umn.edu/jwerner/>.

- Terry Roe (Outside Examiner for Thesis Defense)
Professor Emeritus of Applied Economics
University of Minnesota, St. Paul
E-Mail: troe@umn.edu.
Telephone: +1 (612) 625-6706.

- Hengjie Ai (Outside Examiner for Prelim Oral)
Associate Professor of Finance
University of Minnesota, Minneapolis
E-Mail: hengjie@umn.edu.
Telephone: +1 (612) 626-7348.
Home Page: <https://www.hengjieai.com/>.

GARIVALTIS' FORMULAS.

- The cost of achieving the best continuously-rebalanced gearing ratio in hindsight (à la Ordentlich and Cover 1998) for a single risk asset (say, the S&P 500[®] index) over a T -year horizon:

$$C(S, t) = \sqrt{\frac{T}{t}} \times \exp\left(rt + \frac{z^2}{2}\right), \quad (1)$$

where

$$z := \frac{\log(S/S_0) - (r - \sigma^2/2)t}{\sigma\sqrt{t}}; \quad (2)$$

t is the number of years that have elapsed since the reference date; σ is the annual log-volatility of the underlying; S is the current asset price; S_0 was the initial asset price; and r is the risk-free rate of interest. The implied trading strategy will own

$$\Delta(S, t) = \frac{C(S, t) \times z}{S\sigma\sqrt{t}} \quad (3)$$

shares of the underlying in state (S, t) .

- The cost of achieving the best continuously-rebalanced portfolio in hindsight for a market with n correlated risk assets:

$$C(S, t) = \left(\frac{T}{t}\right)^{n/2} \times \exp\left(rt + \frac{1}{2}z'R^{-1}z\right), \quad (4)$$

where

$$z_i := \frac{\log(S_i/S_{i0}) - (r - \sigma_i^2/2)t}{\sigma_i\sqrt{t}}; \quad (5)$$

σ_i is the annual log-volatility of asset i ; S_i is the current price of asset i ; S_{i0} was the initial price of asset i ; and R is the correlation matrix of instantaneous asset returns. The implied trading strategy will own

$$\Delta_i(S, t) = \frac{C(S, t) \times (R^{-1}z)_i}{S_i\sigma_i\sqrt{t}} \quad (6)$$

shares of asset i in state (S_1, \dots, S_n, t) , where $(R^{-1}z)_i$ denotes the i^{th} coordinate of the vector $R^{-1}z$.