



Adam Maurice Brandenburger

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Adam Brandenburger holds appointments at New York University as J.P. Valles Professor at the Stern School of Business, Distinguished Professor at the Tandon School of Engineering, Faculty Director of the NYU Shanghai Program on Creativity + Innovation, and Global Network Professor. He was a professor at Harvard Business School from 1987 to 2002. He received his B.A., M.Phil., and Ph.D. degrees from the University of Cambridge. Adam researches in the areas of game theory, information theory, and business strategy.

### **Appointments**

2017-present

Global Network Professor, New York University

2016-present

Affiliated Faculty Member, NYU Shanghai

2014-present

Distinguished Professor, Tandon School of Engineering, New York University

2002-present

J.P. Valles Professor, Stern School of Business, New York University

1998-2002

Class of 1958 Professor, Harvard Business School

1996-1998

Professor, Harvard Business School

1992-1996

Associate Professor, Harvard Business School

1987-1992

Assistant Professor, Harvard Business School

### **Education**

1986

Ph.D. in Economics, Churchill College, University of Cambridge

1982

M.Phil. in Economics with Distinction, Trinity College, University of Cambridge

1981

B.A. Double First in Natural Sciences and Economics, Queens' College, University of Cambridge

## Teaching Experience

Creativity Considered (elective undergraduate course, NYU Shanghai)  
Introduction to Game Theory (elective undergraduate course, NYU Shanghai)  
The Strategist (elective MBA and EMBA course, Stern School of Business, J-Term course, NYU Shanghai)  
The Project (elective MBA course, Stern School of Business)  
Game Theory (elective MBA and EMBA course, Stern School of Business)  
Business Strategy (core MBA course, Stern School of Business)  
Changing the Game (elective MBA course, Harvard Business School)  
Game Theory (doctoral course, Harvard Business School)  
Seminar in Business Strategy (doctoral course, Harvard Business School)  
Competition & Strategy (core MBA and executive course, Harvard Business School)  
Engineering Sciences 201 (Faculty of Arts and Sciences, Harvard University)  
Engineering Sciences 207 (Faculty of Arts and Sciences, Harvard University)  
Managerial Economics (core MBA course, Harvard Business School)

## Articles

84. "Communication via Delay in a Coordination Game," with Ye Jin and Zhen Zhou, January 2020.
83. "Game Theory: A Language of Interaction," to appear in *Neuroeconomics*, Lecture Notes Series, World Scientific, 2020.
82. "The Divisive Normalization Transformation and Efficiency," with Stefan Bucher, December 2019.
81. "Rules for Co-opetition," with Barry Nalebuff, December 2019.
80. "Using 'Proof-of-Presence' to Coordinate," with Kai Steverson, November 2019.
79. "Are Your Company's Strengths Really Weaknesses?" *Harvard Business Review*, August 2019, at <https://hbr.org/2019/08/are-your-companys-strengths-really-weaknesses>.
78. "Rényi Entropy, Signed Probabilities, and the Qubit," with Pierfrancesco La Mura and Stuart Zoble, July 2019.
77. "Axioms for Rényi Entropy with Signed Measures," with Pierfrancesco La Mura," July 2019.
76. "Infinite Cooperative Games," with H. Jerome Keisler and Paula Miret, July 2019.
75. "Choice-Theoretic Foundations of the Divisive Normalization Model," with Kai Steverson and Paul Glimcher, *Journal of Economic Behavior & Organization*, 164, 2019, 148-165, at <https://doi.org/10.1016/j.jebo.2019.05.026>.
74. "Choice-Theoretic Foundations of the Divisive Normalization Model: Online Appendix," with Kai Steverson and Paul Glimcher, November 2018.
73. "Axioms for the Boltzmann Distribution," with Kai Steverson, *Foundations of Physics*, 49, 2019, 444-456, at <https://doi.org/10.1007/s10701-019-00257-z>.
72. "Agreement and Disagreement in a Non-Classical World," with Patricia Contreras-Tejada, Pierfrancesco La Mura, Giannicola Scarpa, and Kai Steverson, in *Proceedings of LFDSN 2019*, ed. by Beishui Liao, Fenrong Liu, and Huimin Dong, May 2019.
71. "Identification of Reasoning about Rationality," with Alex Danieli and Amanda Friedenber, April 2019, under review at *Theoretical Economics*.
70. "To Change the Way You Think, Change the Way You See," *Harvard Business Review*, April 2019, at <https://hbr.org/2019/04/to-change-the-way-you-think-change-the-way-you-see>.
69. "Strategy Needs Creativity," *Harvard Business Review*, March-April 2019, at <https://hbr.org/2019/03/strategy-needs-creativity>.
68. "Quantum-Assisted Observatories in Space: Real-Time Coherence in Space Telescope Arrays via Shared Quantum States," with Pierfrancesco La Mura and Giannicola Scarpa, September 2018.

67. "A Test for Artificial Empathy," with Cheryl Loh, May 2018.
66. "A Canonical Hidden-Variable Space," with H. Jerome Keisler, *Annals of Pure and Applied Logic*, 169, 2018, 1295-1302, at <https://doi.org/10.1016/j.apal.2018.08.003>.
65. "Where Do Great Strategies Really Come From?" *Strategy Science*, 2, 2017, 220-225, at <https://doi.org/10.1287/stsc.2017.0039>.
64. "Wenn die Lichtgeschwindigkeit nicht mehr ausreicht: Quantennetzwerke könnten internationalen Teams helfen," with Pierfrancesco La Mura, *Frankfurter Allgemeine Zeitung*, July 4, 2016.
63. "Epistemic Conditions for Nash Equilibrium" (extended version), with Robert Aumann, in *Readings in Formal Epistemology: Sourcebook*, ed. by Horacio Arlo-Costa, Vincent Hendricks, and Johan van Benthem, Springer, 2016.
62. "Team Decision Problems with Classical and Quantum Signals," with Pierfrancesco La Mura, *Philosophical Transactions of the Royal Society A*, 374, 2016, 20150096.
61. "Fiber Products of Measures and Quantum Foundations," with H. Jerome Keisler, in *Logic & Algebraic Structures in Quantum Computing & Information*, ed. by Jennifer Chubb, Ali Eskandarian, and Valentina Harizanov, in *Lecture Notes in Logic*, Association for Symbolic Logic/Cambridge University Press, 2016; also at [adambrandenburger.com](http://adambrandenburger.com).
60. "Thinking About Thinking and Its Cognitive Limits," with Xiaomin Li, August 2015.
59. "How Many Levels Do Players Reason? Observational Challenges and a Solution," extended abstract, with Alex Danieli and Amanda Friedenberg, in *Proceedings of the 15th Conference on Theoretical Aspects of Rationality and Knowledge (TARK)*, 2015, at <http://www.imsc.res.in/tark/TARK2015-proceedings.pdf>.
58. "Are Admissibility and Backward Induction Consistent?" with Amanda Friedenberg, February 2014.
57. "No-Signalling is Equivalent to Free Choice of Measurements," with Samson Abramsky and Andrei Savochnik, in *Electronic Proceedings in Theoretical Computer Science*, 171, 2014, Proceedings of the 10th International Workshop on Quantum Physics and Logic, at <http://eptcs.web.cse.unsw.edu.au/paper.cgi?QPLX.1>.
56. "An Operational Interpretation of Negative Probabilities and No-Signalling Models," with Samson Abramsky, in *Horizons of the Mind: A Tribute to Prakash Panangaden*, ed. by Franck van Breugel, Elham Kashefi, Catuscia Palamidessi, and Jan Rutten, *Lecture Notes in Computer Science* 8464, Springer, 2014, 59-75; also at <http://arxiv.org/abs/1401.2561>.
55. "Higher Education at a Strategic Inflection Point," *The Stern Opportunity*, October 2013.
54. "The Invisible Hand --- Invisible Because It Does Not Exist?" with Harborne Stuart, December 2013.
53. "Use of a Canonical Hidden-Variable Space in Quantum Mechanics," with H. Jerome Keisler, in *Computation, Logic, Games, and Quantum Foundations: The Many Facets of Samson Abramsky*, ed. by Bob Coecke, Luke Ong, and Prakash Panangaden, *Lecture Notes in Computer Science* 7860, Springer, 2013, 1-6.
52. "Comment on 'Towards a Behavioral Theory of Strategy' by Giovanni Gavetti," with Natalya Vinokurova, *Organization Science*, 23, 2012, 286-287.
51. "Fixed Points in Epistemic Game Theory," with Amanda Friedenberg and H. Jerome Keisler, in *Mathematical Foundations of Information Flow*, ed. by Samson Abramsky and Michael Mislove, *Proceedings of Symposia in Applied Mathematics*, Vol. 71, American Mathematical Society, 2012, 49-60.
50. "The Sheaf-Theoretic Structure of Non-Locality and Contextuality," with Samson Abramsky, *New Journal of Physics*, 13, 2011, 113036.
49. "The Relationship between Rationality on the Matrix and the Tree," with Amanda Friedenberg, rev. March 2011.
48. "Origins of Epistemic Game Theory," in *Epistemic Logic: Five Questions*, ed. by Vincent Hendricks and Olivier Roy, Automatic Press, 2010, 59-69.

47. "The Relationship between Quantum and Classical Correlation in Games," *Games and Economic Behavior*, 69, 2010, 175-183.
46. "Self-Admissible Sets," with Amanda Friedenberg, *Journal of Economic Theory*, 145, 2010, 785-811.
45. "A Classification of Hidden-Variable Properties," with Noson Yanofsky, *Journal of Physics A: Mathematical and Theoretical*, 41, 2008, 425302.
44. "Intrinsic Correlation in Games," with Amanda Friedenberg, *Journal of Economic Theory*, 141, 2008, 28-67.
43. "Intrinsic Correlation in Games: Online Appendix," with Amanda Friedenberg, October 2007.
42. "Admissibility in Games," with Amanda Friedenberg and H. Jerome Keisler, *Econometrica*, 76, 2008, 307-352.
41. "Admissibility in Games: Online Supplement," with Amanda Friedenberg and H. Jerome Keisler, *Econometrica*, 76, 2008.
40. "Epistemic Game Theory: An Overview," in *The New Palgrave Dictionary of Economics*, 2nd edition, ed. by Steven Durlauf and Lawrence Blume, London: Palgrave Macmillan, 2008.
39. "Epistemic Game Theory: Complete Information," in *The New Palgrave Dictionary of Economics*, 2nd edition, ed. by Steven Durlauf and Lawrence Blume, London: Palgrave Macmillan, 2008.
38. Interview, in *Game Theory: Five Questions*, ed. by Vincent Hendricks and Pelle Guldberg Hansen, Automatic Press, 2007, 41-48.
37. "The Power of Paradox: Some Recent Developments in Interactive Epistemology," *International Journal of Game Theory*, 35, 2007, 465-492.
36. "A Note on Kuhn's Theorem," in *Texts in Logic and Games I: Interactive Logic: Proceedings of the 7th Augustus de Morgan Workshop*, London, ed. by Johan van Benthem, Dov Gabbay, and Benedikt Loewe, Amsterdam University Press, 2007, 71-88.
35. "Biform Games," with Harborne Stuart, *Management Science*, 53, 2007, 537-549.
34. "Biform Games: Electronic Companion," with Harborne Stuart, *Management Science*, 53, 2007.
33. "Biform Games: Additional Online Material," with Harborne Stuart, July 2006.
32. "Notes on the Relationship between Strong Belief and Assumption," with Amanda Friedenberg and H. Jerome Keisler, rev. April 2007.
31. "A Purification Theorem for Perfect-Information Games," with Amanda Friedenberg, rev. January 2007.
30. "An Impossibility Theorem on Beliefs in Games," with H. Jerome Keisler, *Studia Logica*, 84, 2006, 211-240.
29. "On the Existence of a 'Complete' Possibility Structure," in *Cognitive Processes and Economic Behavior*, ed. by Marcello Basili, Nicola Dimitri, and Itzhak Gilboa, Routledge, 2003, 30-34.
28. "Porter's Added Value: High Indeed!" (Commentary on *Competitive Strategy*, by Michael Porter, New York: Free Press, 1980), in *Academy of Management Executive*, 18, 2002, 58-60.
27. Review of *Judo Strategy*, by David Yoffie and Mary Kwak, Boston: Harvard Business School Press, 2001, in *Manageris*, 101, February 2002, 10.
26. "Epistemic Conditions for Iterated Admissibility," with H. Jerome Keisler, in *Theoretical Aspects of Rationality and Knowledge: Proceedings of the Eighth Conference*, ed. by Johan van Benthem, Morgan Kaufmann, 2001, 31-37.
25. "The Added-Value Theory of Business," with Barry Nalebuff, *Strategy & Business*, Fourth Quarter 1997.
24. "Complementors in the Digital Economy," with Barry Nalebuff, *Oracle Alliance*, March-April 1997.

23. "Entry and Deterrence in British Satellite Broadcasting," with Pankaj Ghemawat, in *Games Businesses Play: Cases and Theory*, by Pankaj Ghemawat, MIT Press, 1997, 177-204.
22. "Strategic and Structural Uncertainty in Games," in *Wise Choices: Decisions, Games, and Negotiations*, ed. by Richard Zeckhauser, Ralph Keeney, and James Sebenius, Harvard Business School Press, 1996, 221-232.
21. Review of *Only the Paranoid Survive*, by Andrew Grove, New York: Currency/Doubleday, 1996, with Barry Nalebuff, in *Harvard Business Review*, November-December 1996, 168-175.
20. "Laurel Without Hardy? A Lesson for Business," with Barry Nalebuff, *The New York Times*, August 18, 1996.
19. "When Managers Cover Their Posteriors: Making the Decisions the Market Wants to See," with Ben Polak, *The RAND Journal of Economics*, 27, 1996, 523-541.
18. "Value-Based Business Strategy," with Harborne Stuart, *Journal of Economics & Management Strategy*, 5, 1996, 5-24.
17. "The Right Game: Use Game Theory to Shape Strategy," with Barry Nalebuff, *Harvard Business Review*, July-August 1995, 57-71.
16. "Epistemic Conditions for Nash Equilibrium," with Robert Aumann, *Econometrica*, 63, 1995, 1161-1180.
15. "Hierarchies of Beliefs and Common Knowledge," with Eddie Dekel, *Journal of Economic Theory*, 59, 1993, 189-198.
14. "Knowledge and Equilibrium in Games," *Journal of Economic Perspectives*, 6, 1992, 83-101.
13. "Correlated Equilibrium with Generalized Information Structures," with Eddie Dekel and John Geanakoplos, *Games and Economic Behavior*, 4, 1992, 182-201.
12. "Lexicographic Probabilities and Iterated Admissibility," in *Economic Analysis of Markets and Games: Essays in Honor of Frank Hahn*, ed. by Partha Dasgupta, Douglas Gale, Oliver Hart, and Eric Maskin, MIT Press, 1992, 282-290.
11. Review of *Thinking Strategically*, by Avinash Dixit and Barry Nalebuff, New York: Norton, 1991, in *Journal of Economics & Management Strategy*, 2, 1993, 325-332.
10. "Lexicographic Probabilities and Equilibrium Refinements," with Larry Blume and Eddie Dekel, *Econometrica*, 59, 1991, 81-98.
9. "Lexicographic Probabilities and Choice under Uncertainty," with Larry Blume and Eddie Dekel, *Econometrica*, 59, 1991, 61-79.
8. "Common Knowledge and Game Theory," with Ken Binmore, in *Essays on the Foundations of Game Theory*, by Ken Binmore, Basil Blackwell, 1990, 105-150.
7. "A Simple Characterization of Stochastically Monotone Functions," with James Bergin, *Econometrica*, 58, 1990, 1241-1243.
6. "Common Knowledge of an Aggregate of Expectations," with Lars Nielsen, John Geanakoplos, Richard McKelvey, and Talbot Page, *Econometrica*, 58, 1990, 1235-1239.
5. "An Overview of Lexicographic Choice under Uncertainty," with Larry Blume and Eddie Dekel, in *Choice Under Uncertainty*, ed. by Peter Fishburn and Irving LaValle, *Annals of Operations Research*, 19, 1989, 231-246.
4. "The Role of Common Knowledge Assumptions in Game Theory," with Eddie Dekel, in *The Economics of Missing Markets, Information, and Games*, ed. by Frank Hahn, Oxford University Press, 1989, 46-61.
3. Review of *Economic Organizations as Games*, ed. by Ken Binmore and Partha Dasgupta, Basil Blackwell, 1986, in *Econometrica*, 55, 1988, 278-279.
2. "Rationalizability and Correlated Equilibria," with Eddie Dekel, *Econometrica*, 55, 1987, 1391-1402.
1. "Common Knowledge with Probability 1," with Eddie Dekel, *Journal of Mathematical Economics*, 16, 1987, 237-245.

## Books

3. *A Mathematical Theory of Strategy*, with Harborne Stuart, in progress with World Scientific.
2. *The Language of Game Theory: Putting Epistemics into the Mathematics of Games*, World Scientific Series in Economic Theory, ed. by Eric Maskin, World Scientific, 2014. Published in Chinese by Truth & Wisdom Press, Shanghai, May 2019.
1. *Co-opetition*, with Barry Nalebuff, Currency/Doubleday, 1996. Translated into Bahasa, Chinese, Dutch, French, German, Greek, Hebrew, Japanese, Korean, Portuguese, Russian, Spanish, Swedish, Thai, Turkish, Vietnamese.

## Recent Invited Talks

- “Epistemic Game Theory,” NYU Neuroeconomics Summer School, NYU Shanghai, July 2019.
- “Agreement and Disagreement in a Non-Classical World,” keynote talk at LFDSN 2019, Zhejiang University, Hangzhou, May 2019.
- “Agreement and Disagreement in a Quantum World,” invited talk at Encapsulated Agents in Quantum Theory: Re-examining Wigner’s Friend, workshop, UMass Boston, March 2019.
- “Using Proof-of-Work to Coordinate,” keynote talk at Game Theory Conference, University of Shanghai for Science and Technology, September 2018.
- “Strategy Needs Creativity,” distinguished scholar lecture at Southern University of Science and Technology, Shenzhen, June 2018.
- “Strategy Needs Creativity,” leadership workshop at Schwarzman College, May 2018.
- “Epistemic Game Theory,” Tsinghua University, May 2018.
- “Strategy Needs Creativity,” keynote talk at 2017 Global Cre8 Summit, Shenzhen, December 2017.
- “Where Do Great Strategies Really Come From?” *Strategy Science* workshop, Apple University, September 2017.
- “Epistemic Game Theory” and “Normalization Models: Normative Foundations,” NYU Neuroeconomics Summer School, NYU Shanghai, July 2017.
- “Strategy from Creativity,” keynote talk at AMT Quarterly Partners Summit, Shanghai, April 2017.
- “The Father of Singularity: A Case Study in Creativity and Innovation,” public talk, East China Normal University, March 2017.
- “Mentoring,” invited talk at Entrepreneurs’ Organization Accelerator APAC Mentorship Summit, Shanghai, February 2017.
- “Your Idea Is, Of Course, Crazy,” keynote talk at Global Cre8 Summit, Shenzhen, October 2016.
- “Epistemic Game Theory: Language and Observation,” public talk, NYU Shanghai, October 2015.
- “Entropy and Simulation of No-Signaling Models,” inaugural lecture at Institute for Quantum Social and Cognitive Science, University of Leicester, October 2015.
- “Entropy and Simulation of No-Signaling Models,” at Logic Colloquium 2015, University of Helsinki, August 2015.
- “Game Theory,” NYU Shanghai Neuroeconomics Summer School, NYU Shanghai, July 2015.
- “Formal Methods,” keynote talk at Vienna Conference on Strategy, Organizational Design, and Innovation, University of Vienna, June 2015.
- “Epistemic Game Theory: Language and Observation,” at 8th Pan-Pacific Conference on Game Theory, Academia Sinica, Taiwan, May 2015.
- “Deriving the Qubit from Entropy Principles,” at Conference on Quantum Probability and the Mathematical Modelling of Decision Making, Fields Institute, University of Toronto, March 2015.

“Deriving the Qubit from Entropy Principles,” at Workshop on Correlated Information Change, University of Amsterdam, November 2014.  
“Epistemic Game Theory,” at 2014 China Meeting of the Econometric Society, Xiamen University, China, June 2014.

### **Fellowships/Honors**

2017

Fellow of the Game Theory Society

2008

NYU Stern Teaching Excellence Award

2006

NYU Stern MBA 2006 Professor of the Year

2004

Fellow of the Econometric Society

1985-1987

Research Fellowship, Churchill College, University of Cambridge

1983-1985

Harkness Fellowship

1981

College Prize and Foundation Scholarship, and University Wrenbury Scholarship in Economics

1979

College Prize and Venn Prize in Natural Sciences for top College Natural Sciences Tripos result

1978

Open Scholarship to Queens' College, University of Cambridge

### **Doctoral Students**

Raja Panjwani, New York University, current

Elliot Lipnowski, New York University, PhD 2016, University of Chicago

Sandy Yu, New York University, PhD 2015, University of Minnesota

Shellwyn Weston, New York University, PhD 2013

Natalya Vinokurova, New York University, PhD 2012, University of Pennsylvania

Andrei Savochkin, New York University, PhD 2012, New Economic School, Moscow

Andrea Prado, New York University, PhD 2011, INCAE, Costa Rica

Matthew Grennan, New York University, PhD 2010, University of Pennsylvania

Konrad Grabiszewski, New York University, PhD 2008, University of Miami

Amanda Friedenbergl, Harvard University, PhD 2003, Arizona State University

Terence Burnham, Harvard University, PhD 1997

Hong Hu, Harvard University, PhD 1996

Harborne Stuart, Harvard University, PhD 1992

### **Selected Service**

Faculty Director, NYU Shanghai Program on Creativity + Innovation (PCI)

Chair, NYU Shanghai Interactive Media & Business Steering Committee

Member, NYU Shanghai Fellowships Committee

Member, NYU Shanghai Neuroeconomics Colloquium Organizing Committee

Member, NYU Shanghai Study Away Committee

Member, NYU Stern Senior Faculty Peer Review Committee

Member, Scientific Oversight Committee, Center for Information and Bubble Studies, University of Copenhagen

Co-Area Leader, NYU Shanghai Economics, Spring 2017

Member, All-University Graduate Program Committee, NYU, 2014-2016  
Vice Dean for Innovation, NYU Stern School of Business, 2011-2014  
Co-Coordinator, Economics PhD program, NYU Stern School of Business, 2006-2011  
Chair and Member, Schoolwide Promotion & Tenure Committee, NYU Stern School of  
Business, 2003-2009  
Chair, Business Economics PhD program, Harvard University, 2000-2002