

## William A. Brock

### Curriculum Vitae September 10, 2022

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Department of Economics, University of Missouri, 615 Locust Street  
Columbia, Missouri, 65201

(I was teaching in Columbia for March 2013-2018, I am now working at my Cross Plains, WI. home 2019-on with occasional trips to Columbia to work with faculty members there)

#### **Education:**

University of Missouri, Columbia, Mo., A.B., 1965, with Honors, (Mathematics)  
University of California, Berkeley, Ca., Ph.D., 1969, (Mathematics)

#### **Employment:**

2012-            Research Professor, University of Missouri, Columbia (2012-)  
2011-            Vilas Research Professor of Economics (Emeritus), University of  
                    Wisconsin, Madison (effective August 29, 2011)  
1990-2011      Vilas Research Professor of Economics, University of Wisconsin,  
                    Madison  
1984-2011      F.P. Ramsey Professor of Economics, University of Wisconsin, Madison  
1975-1983      Professor of Economics, University of Wisconsin, Madison  
1975-1981      Professor of Economics, the University of Chicago  
1974-1977      Associate & Full Professor of Economics, Cornell University  
1972-1975      Associate Professor of Economics, The University of Chicago  
Fall 1973       Visiting Associate Professor of Economics, The University of Rochester,  
                    Rochester, New York  
1969-1971      Assistant Professor of Economics and Mathematics, The University of  
                    Rochester, Rochester, New York

#### **Honors, Awards, and Grants:**

Bernard Friedman Memorial Prize, University of California at Berkeley (for excellence of Ph.D. Thesis in applied mathematics), 1968.

National Science Foundation Grants, continuously from 1970-2003 and renewed under the "Special Creativity" extension program, Summer 1997. National Science Foundation

Grant(Applied Section) 1983-1985. NSF Grant (with S. Durlauf), awarded in 2005.

Fellow of Econometric Society since 1974.

Sherman Fairchild Distinguished Scholar, California Institute of Technology, 1978.

Romnes Faculty Fellow, University of Wisconsin, Madison, 1981.

Guggenheim Fellow, 1987.

R.F. Murray Competition for Best Paper of the Year, Institute for Quantitative Research and Finance, Columbia University, for paper entitled, "Applications of Nonlinear Science Statistical Inference Theory to Finance and Economics: Third Prize, 1988.

Fellow of the American Academy of Arts and Sciences since 1992.

Member of the National Academy of Sciences since 1998.

Ralf Yorque, Society. Inducted, 1999.

Distinguished Fellow, American Economic Association, 2004.

Beijer Fellow, since 2008

Doctor honoris causa, University of Amsterdam, January, 2009

Chancellor's Distinguished Visitor, University of Missouri, Columbia, April 14,15, 2011

Distinguished Alumni Award, University of Missouri, Columbia, February 24, 2012

Society for the Advancement of Economic Theory, Fellow, since 2012

Institute for Nonlinear Dynamical Inference Fellow, Moscow, Russia, since 2017

Honorary Member, Phi Beta Kappa, University of Missouri, Inducted May 11, 2018

### **Teaching Awards**

Division of University Housing's Honored Instructors Award, November 30, 2009

Division of University Housing's Honored Instructors Award, November 22, 2010

### **Publications:**

1. With Russell G. Thompson, "Integrated Economic Structures: A new Approach," Metroeconomica, XVII, September-December 1965, 131-151.
2. Russell G. Thompson, Dale K. Colyer, Robert R. Wilson, and William A. Brock, "Computational Techniques," A Research Center, School of Business and Public Administration, University of Missouri publication, 1965.
3. With Russell G. Thompson, "Convex Solutions of Implicit Relations," Mathematics Magazine, 39, September-October 1966, 208-211.
4. "On Existence of Weakly Maximal Programs in a Multisector Economy," Review of Economic Studies, XXXVII (2), April 1970, 275-280.
5. With David Gale, "Optimal Growth Under Factor Augmenting Progress," Journal of Economic Theory, 1 (3), October 1969, 229-243.
6. "An Axiomatic Basis for the Ramsey-Weizsacker Overtaking Criterion: A Note," Econometrica, 38 (6), November 1970, 927-929.
7. "Sensitivity of Optimal Growth Paths with Respect to a Change in Target Stocks," in Contributions to the Von Neumann Growth Model, G. Brockman and W. Weber (eds.), New York: Springer Verlag, 1971, 73-89.
8. With Leonard J. Mirman, "A One Sector Model of Economic Growth with Uncertain Technology: An Example of Steady State Analysis in a Stochastic Optimal Control Problem" in Techniques of Optimization, A. Balakrishnan (ed.), New York: Academic Press, 1972, 407-419.
9. With Leonard J. Mirman, "Optimal Economic Growth and Uncertainty: The Discounted Case," Journal of Economic Theory, 4 (3), June 1972, 479-513.
10. "A Polluted Golden Age," in Economics of Natural and Environmental Resources, V. Smith (ed.), New York: Gordon and Breach, 1977, 441-462.
11. "On Models of Expectations that Arise from Maximizing Behavior of Economic Agents Over Time," Journal of Economic Theory, 5 (3), December 1972, 348-376.
12. "With Leonard Mirman, "Optimal Economic Growth and Uncertainty: The No Discounting Case," International Economic Review, 14 (3), October 1973, 560-573.
13. "Some Results on the Uniqueness of Steady States in Multi-Sector Models of Optimum Growth When Future Utilities are Discounted," International Economic Review, 14 (3), October 1973, 535-559.
14. "Money and Growth: The Case of Long Run Perfect Foresight, " International Economic

- Review, 15 (3), October 1974, 750-777.
15. "Discussion of Roy Radner's Survey Paper," presented at Toronto A.E.A. Meetings, 1972. In Frontiers of Quantitative Economics, Vol. II, M.D. Intriligator and D.A. Kendrick (eds.) New York: North-Holland Publishing Company, 1974, 91-92.
  16. "A Simple Perfect Foresight Monetary Model," Journal of Monetary Economics, 1, 1975, 133-150.
  17. With Jose A. Scheinkman, "Some Results on Global Asymptotic Stability of Difference Equations," Journal of Economic Theory, 10 (2), April 1975, 265-268.
  18. With Jose A. Scheinkman, "Global Asymptotic Stability of Optimal Control Systems with Applications to the Theory of Economic Growth," Journal of Economic Theory, 12 (1), February 1976, 164-190.
  19. "Comments on Kenneth Arrow's paper 'Welfare Analysis of Changes in Health Coinsurance Rates,' " in The Role of Health Insurance in the Health Services Sector, Richard N. Rosett (ed.), New York: Neale Watson, 1976, 24-29.
  20. With Jose A. Scheinkman, "On the Long Run Behavior of a Competitive Firm," in Equilibrium and Disequilibrium in Economic Theory, G. Schwodiauer (ed.), Dordrecht-Holland, Boston USA: D. Reidel Publishing Company, 1977, 397-411.
  21. With Jose A. Scheinkman, "The Global Asymptotic Stability of Optimal Control with Applications to Dynamic Economic Theory," in Applications of Control Theory to Economic Analysis, J. Pitchford and S. Turnovsky (eds.), North-Holland, 1977, 173-208.
  22. With Mukul Majumdar, "Global Asymptotic Stability Results for Multi-Sector Models of Optimal Growth Under Uncertainty When Future Utilities are Discounted," Journal of Economic Theory, 18 (2), August 1978, 225-243.
  23. With Edwin Burmeister, "Regular Economies and Conditions for Uniqueness of Steady States in Optimal Multisector Economic Models," International Economic Review, 17, February 1976, 105-120.
  24. "Global Asymptotic Stability of Optimal Control: A Survey of Recent Results," Frontiers of Quantitative Economics, Vol. III, Michael Intriligator (ed.), New York: American Elsevier Pub., 1977, 207-237.
  25. "Optimal Growth: Stability Theory," Handwueterbuch der Mathematischen Wirtschaftswissenschaften, Hrsg: Reinhard Selten, Universtaet Bielefeld, Westdutscher Verlag, Institut fur Mathematische Wirtschaftsforschung, 1975, 303-308.
  26. With A. Haurie, "On Existence of Overtaking Optimal Trajectories Over an Infinite Time

- Horizon," Mathematics of Operations Research, 1 (4), November 1976, 337-346.
27. "Differential Games with Active and Passive Variables," in Mathematical Economics and Game Theory: Essays in Honor of Oskar Morgenstern, R. Henn and O. Moeschlin (eds.), Berlin: Springer-Verlag, 1977, 34-52.
  28. "The Design of Mechanisms for Efficient Allocation of Public Goods," in Quantitative Economics and Development, M. Nerlove, L. Klein and S. Tsiang, (eds.), Academic Press. 1980, 45-79.
  29. With S. P. Magee, "The Economics of Special Interest Politics: The Case of the Tariff," American Economic Review, 68 (2), May 1978, 246-250.
  30. "Asset Prices in a Production Economy," in Economics of Information and Uncertainty, J.J. McCall (ed.), University of Chicago Press, 1982, 1-43.
  31. With M.J.P. Magill, "Dynamics under Uncertainty," Econometrica, 47(4), July 1979, 843-868.
  32. "An Integration of Stochastic Growth Theory and the Theory of Finance -- Part I: The Growth Model," in General Equilibrium, Growth, and Trade, J. Green and J. Scheinkman (eds.), New York: Academic Press, 1979, 165-190.
  33. "Asset Pricing in an Economy with Production: A Selective Survey of Recent Works on Asset Pricing Models" in Dynamic Optimization and Mathematical Economics, P. Liu (ed.), New York: Plenum, 1980, 5-30.
  34. With S.P. Magee, "Tariff Setting in a Democracy", in Current Issues in International Commercial Policy and Economic Diplomacy, J. Black and B. Hindley (eds.), London: Macmillan Press, 1979, 1-9.
  35. With S. Turnovsky, "Time Consistency and Optimal Government Policies in Perfect Foresight Equilibrium," Journal of Public Economics, 13, April 1980, 183-212.
  36. With Jose A. Scheinkman, "Some Remarks on Monetary Policy in An Overlapping Generations Model," in Models of Monetary Economies, J. Kareken and N. Wallace (eds.), Minneapolis Federal Reserve Bank, 1980, 211-232.
  37. With S. Turnovsky, "The Analysis of Macroeconomic Policies in Perfect Foresight Equilibrium," International Economic Review, 22 (1), February 1981, 179-209.
  38. With S.P. Magee, "The Bang-Bang Model of Public Utility Regulation in Intertemporal General Equilibrium," in Telecommunications Policy Handbook, Jorge Reina Schement, Felix Gutierrez, and Marvin A. Sirbu (eds.), New York: Praeger Publishers, 1982, 129-141.

39. With David S. Evans, "Predation: A Critique of the Governments' Case in U.S. vs AT&T", in Breaking Up Bell: Essays on Industrial Organization and Regulation, D.S. Evans (ed.), North Holland, 1983, 41-94.
40. With David S. Evans, "Creamskimming", in D.S. Evans op. cit., 61-94.
41. "Pricing, Predation, and Entry Barriers in Regulated Industries," in D.S. Evans op. cit., 191-229.
42. With J.A. Scheinkman, "Free Entry and the Sustainability of Natural Monopoly," in D.S. Evans op. cit., 231-252.
43. "Contestable Markets and The Theory of Industry Structure: A Review Article," Journal of Political Economy, 91 (6), December 1983, 1055-1066.
44. "Applications of Recent Results on the Asymptotic Stability of Optimal Control to the Problem of Comparing Long Run Equilibria," in Models of Economic Dynamics, Lecture Notes in Economics and Mathematical Systems, #264, H. Sonnenschein, (ed.), New York: Springer Verlag, 1986, 86-116.
45. With M. Rothschild "Comparative Statics for Multidimensional Optimal Stopping Problems," in H. Sonnenschein (ed.), op. cit., 124-138.
46. With S.P. Magee, "The Invisible Foot and the Waste of Nations: Redistribution and Economic Growth" in Neoclassical Political Economy, D.C. Colander (ed.), Cambridge MA: Ballinger Publishing Company, 1985, 177-186.
47. With J.A. Scheinkman, "Price-Setting Supergames with Capacity Constraints," Review of Economic Studies, 52, 1985, 371-382.
48. With W.D. Dechert, "Dynamic Ramsey Pricing," International Economic Review, 26 (3), October 1985, 569-591.
49. With D.S. Evans, "The Economics of Regulatory Tiering," Rand Journal of Economics, Autumn 1985, 398-409.
50. "Economic Dynamics: An Optimal Control Framework," in The New Palgrave, J. Eatwell, M. Milgate, and P. Newman (eds.), London: Macmillan, 1987, 721-726.
51. "Distinguishing Random and Deterministic Systems," Journal of Economic Theory, 40 (1), October 1986, 68-95.
52. With W.D. Dechert, "Theorems on Distinguishing Deterministic From Random Systems," in Dynamic Econometric Modelling, W. Barnett, E. Berndt, and H. White

- (eds.), Cambridge University Press, 1988, 247-265.
53. "Overlapping Generations Models with Money and Transactions Costs," in Handbook of Monetary Economics, B. Friedman and F. Hahn (eds.), New York: North-Holland, 1990, 263-295.
  54. With Chera L. Sayers, "Is the Business Cycle Characterized by Deterministic Chaos?," Journal of Monetary Economics, 22, 1988, 71-90.
  55. With M. Rothschild and J. Stiglitz, "Stochastic Capital Theory," in Joan Robinson and Modern Economic Theory, G. Feiwel, (ed.), New York University Press, 1989, 591-622.
  56. "Nonlinearity and Complex Dynamics in Economics and Finance," in The Economy as An Evolving Complex System, Santa Fe Institute Series in Complexity, Volume 5, P. Anderson, K. Arrow and D. Pines (eds.), Reading, MA: Addison-Wesley, 1988, 77-97.
  57. With D.S. Evans, "Small Business Economics," Small Business Economics, 1, 1989, 7-20.
  58. With W.D. Dechert, "A General Class of Specification Tests; the Scalar Case", in 1988 Proceedings of the Business and Economics Statistics Section, American Statistical Association (ed.), Alexandria VA, 1988, 70-79.
  59. "Hicksian Nonlinearity," in Value and Capital 50 Years After, L. McKenzie and S. Zamagni, (eds.), London: MacMillan, 1991, Chapter 11, 310-330.
  60. "Chaos and Complexity in Economic and Financial Science," in Acting Under Uncertainty; Multi Disciplinary Conceptions, G.M. Von Furstenberg (ed.), Boston: Kluwer Academic Publishing, 1990, Chapter 17, 423-450.
  61. With B. LeBaron, "Liquidity Constraints in Production Based Asset Pricing Models," in Asymmetric Information, Corporate Finance, and Investment, G. Hubbard (ed.), Chicago: University of Chicago Press for the NBER, 1990, Chapter 9, 231-255.
  62. "Causality, Chaos, Explanation and Prediction in Economics and Finance", in Beyond Belief: Randomness, Prediction and Explanation in Science, J. Casti and A. Karlqvist (eds.), Boca Raton, FL: CRC Press, 1991, Chapter 10, 230-279.
  63. With E. Baek, "Some Theory of Statistical Inference for Nonlinear Science", Review of Economic Studies, 58, July 1991, 697-716.
  64. With W.D. Dechert, "Nonlinear Dynamical Systems, Instability and Chaos in Economics", in Handbook of Mathematical Economics, IV, W. Hildenbrand and H. Sonnenschein, (eds.), North Holland, 1991, 2210-2235.

65. "Complexity and Chaos in Economics," in The New Palgrave Dictionary of Money and Finance, J.Eatwell, M. Milgate and P. Newman, (eds.), London: MacMillan, 1992, 416-419.
66. With W.D. Dechert, "Statistical Inference Theory for Measures of Complexity in Chaos Theory and Nonlinear Science," in Measures of Complexity and Chaos, Series B: Physics, N. Abraham, A. Albano, A. Passamente, P. Rapp (eds.) New York: Plenum Press, 1989, 79-97.
67. With S. Potter, (1991a), "Diagnostic Testing for Nonlinearity, Chaos, and General Dependence in Time Series Data," in Proceedings of the 1990 NATO Workshop on Nonlinear Modeling and Forecasting, Santa Fe Institute Series, M.Casdagli and S.Eubank (eds.), Redwood City, CA: Addison-Wesley, 1991, 137-161.
68. With S. Potter, (1991b), "Nonlinear Time Series and Macroeconomics," in Handbook of Statistics, G. Maddala,, C. Rao, H. Vinod (eds.), Amsterdam: North Holland, 1993, 195-229.
69. With E. Baek, "A Nonparametric Test for Temporal Dependence in a Vector of Time Series", Statistica Sinica, 2, 1992, 137-156.
70. With A. Kleidon, "Periodic Market Closure and Trading Volume: A Model of Intraday Bids and Asks", Journal of Economic Dynamics and Control, 16, 1992, North-Holland, 451-489.
71. "Understanding Macroeconomic Time Series Using Complex Systems Theory", Structural Change and Economic Dynamics, 2 (1), 1991, 119-141.
72. With J. Lakonishok and B. LeBaron, "Simple Technical Trading Rules and the Stochastic Properties of Stock Returns", The Journal of Finance, XLVII (5), December 1992, 1731-1764.
73. "Pathways to Randomness in the Economy: Emergent Nonlinearity and Chaos in Economics and Finance," Estudios Economicos, 8 (1), January-June, 1993, 3-55.
74. R. Savit, K. Wu, W. Brock, "Statistical Tests for Deterministic Effects in Broad Band Time Series," Physica D., 69, 1993, 172-188.
75. With W.D. Dechert, J. Scheinkman, B.LeBaron, "A Test for Independence Based Upon the Correlation Dimension," Econometric Reviews, 15 (3), 1996, 197-235.
76. With L. Evans, "Principal-Agent Contracts in Continuous Time Asymmetric Information Models: The Importance of Large Continuing Information Flows," Journal of Economic Behavior and Organization, 29, 1996, 523-535.



77. With B. LeBaron, "A Dynamic Structural Model for Stock Return Volatility and Trading Volume," Review of Economics and Statistics, 78 (1), February 1996, 94-110.
78. With P.de Lima, "Nonlinear Time Series, Complexity Theory, and Finance," in Handbook of Statistics Volume 14: Statistical Methods in Finance, G. Maddala, and C. Rao (eds.), New York: North Holland, 1996, 317-361.
79. "Asset Price Behavior in Complex Environments," in The Economy as An Evolving Complex System II, B. Arthur, S. Durlauf and D. Lane (eds.), Redwood City, CA: Addison-Wesley, 1997, 385-423.
80. With C. H. Hommes, "A Rational Route to Randomness," Econometrica, 65 (5), September 1997a, 1059-1095.
81. With C. H. Hommes, "Models of Complexity in Economics and Finance," in System Dynamics in Economic and Financial Models, B. Hanzon, C. Heij, C. Praagman and J.M. Schumacher (eds.), New York: John Wiley & Sons, 1997b, 3-41.
82. With C.H. Hommes, "Heterogenous Beliefs and Routes to Chaos in a Simple Asset Pricing Model," Journal of Economic Dynamics and Control, 22, 1998, 1235-1274.
83. "Ideas on Quantification of Resilience-Based Management," in Environment and Development Economics, 3 (2), May 1998, 221-226.
84. With C. Hommes, "Rational Animal Spirits," in The Theory of Markets, P. Herings, A. Talman and G. van der Laan (eds.), North Holland: Amsterdam, for the Royal Netherlands Academy of Arts and Sciences, 1999, 109-137.
85. With P. de Fontnouvelle, "Expectational Diversity in Monetary Economics," in Journal of Economic Dynamics and Control, 24, 2000, 725-759.
86. "Whither Nonlinear?" in Journal of Economic Dynamics and Control, 24, 2000, 663-678.
87. With S. N. Durlauf, "A Formal Model of Theory Choice in Science," Economic Theory, 14, 1999, 113-130.
88. "Scaling in Economics: A Reader's Guide," Industrial and Corporate Change, 8 (3), 1999, 409-446.
89. S. Carpenter, D. Ludwig, and W. Brock, "Management of Eutrophication for Lakes Subject to Potentially Irreversible Change," Ecological Applications, 9 (3) 1999, 751-771.
90. S. Carpenter, W. Brock, and P. Hanson, "Ecological and Social Dynamics in Simple

- Models of Ecosystem Management,” Conservation Ecology, 3 (2), 1999, online at <http://www.consecol.org/journal/vol3/iss2/art4>
91. “Some Santa Fe Scenery,” The Complexity Vision and the Teaching of Economics, D. Colander (ed.), Cheltenham: Edward Elgar, 2000, 29-49.
  92. With D. Colander, “Complexity and Policy,” The Complexity Vision and the Teaching of Economics, D. Colander (ed.), Cheltenham: Edward Elgar, 2000, 73-96.
  93. M. Scheffer, W. Brock, and F. Westley, “Socio-economic Mechanisms Preventing Optimum Use of Ecosystem Services: An Interdisciplinary Theoretical Analysis,” Ecosystems 3 (5), 2000.
  94. With S. Durlauf, “Interactions-Based Models,” Handbook of Econometrics: Volume 5, Chapter 54, J. Heckman and E. Leamer (eds.), Elsevier Science B.V., pp. 3297-3380, 2001.
  95. With S. Durlauf, “Discrete Choice with Social Interactions,” Review of Economic Studies, 68 (2), pp. 235-260, April 2001.
  96. With S. Durlauf, “Growth Empirics and Reality,” World Bank Economic Review 15 (2), pp. 229-272, 2001.
  97. “Chaos Theory”, International Encyclopedia of the Social and Behavioral Sciences, P. Baltes and N. Smelser (eds.), Oxford: Pergamon of Elsevier Science, Ltd., pp.1643-1646, 2001.
  98. “Economics of Environmental Regulation,” theme level contribution in The Encyclopedia of Life Support Systems, M. Majumdar (ed.), Oxford: EOLSS Publishers, Ltd., 2001.
  99. “Complexity-Based Methods in Cycles and Growth: Any Potential Value-Added?,” Cycles Growth and Structure Change: Theories and Empirical Evidence, L. Punzo (ed.), London: Routledge, pp. 301-338, 2001.
  100. With A. de Zeeuw, “The Repeated Lake Game,” Economics Letters 76, pp. 109-114, 2002.
  101. With A. Xepapadeas, “Optimal Ecosystem Management When Species Compete for Limiting Resources,” Journal of Environmental Economics and Management 44, pp. 189-220, 2002.
  102. With S. Durlauf, “A Multinomial-Choice Model of Neighborhood Effects,” American Economic Review 92 (2), pp. 298-303, May 2002.

103. With A. Xepapadeas, "Biodiversity Management Under Uncertainty: Species Selection and Harvesting Rules," in Economic Theory for the Environment: Essays in Honour of K.G. Maler, P. Dasgupta, B. Kristrom and K.G. Lofgren (eds), Cheltenham, U.K.: Edward Elgar Publishers, pp. 62-97, 2002.
104. With A. Xepapadeas, "Regulating Nonlinear Environmental Systems Under Knightian Uncertainty," in Economics for an Imperfect World: Essays in Honor of Joseph E. Stiglitz, Arnott, R., Greenwald, B., Kanbur, R., Nalebuff, B., (eds.), Cambridge MA: MIT Press, pp. 127-144, 2003.
105. With A. Xepapadeas, "Valuing Biodiversity from an Economic Perspective: A Unified Economic Ecological and Genetic Approach," American Economic Review 93 (5), pp. 1597-1614, 2003.
106. With S. Durlauf and K. West, "Policy Evaluation in Uncertain Economic Environments," Brookings Papers on Economic Activity, Volume 1, (with discussion), pp. 235-322, 2003.
107. S. Carpenter, W. Brock, "Spatial Complexity, Resilience and Policy Diversity: Fishing on Lake-Rich Landscapes," Ecology and Society 84 (6) pp. 1403-1411, 2003.
108. M. Scheffer, F. Westley, and W. Brock, "Slow Response of Societies to New Problems: Causes and Costs," Ecosystems, 6: pp. 493-502, 2003.
109. G. Peterson, S. Carpenter, W. Brock, "Uncertainty and Management of Multi-State Ecosystems: An Apparently Rational Route to Collapse," Ecology, 84(6), pp. 1403-1411, 2003.
110. D. Ludwig, S. Carpenter, W. Brock, "Optimal Phosphorous Loading for a Potentially Eutrophic Lake," Ecological Applications, 13, pp. 1135-1152, 2003.
111. With D. Starrett, "Managing Systems with Non-Convex Positive Feedback," Environmental and Resource Economics, 26(4), pp. 575-602, 2003
112. With A. Xepapadeas, "Management of Interacting Species: Regulation Under Nonlinearities and Hysteresis," Resource and Energy Economics, 26, pp. 137-156, 2004.
113. With S. Durlauf, "Elements of a Theory of Design Limits to Optimal Policy," The Manchester School, 72, Supplement 2, 1-18, 2004.
114. With C. Hommes and F. Wagener, "Evolutionary Dynamics in Markets with many Trader Types," Journal of Mathematical Economics 41, (1-2), pp. 7-42, 2005.
115. With S. Durlauf, "Local Robustness Analysis: Theory and Application," Journal of Economic Dynamics and Control 29, pp. 2067-2092, 2005.

116. With A. Xepapadeas, “Spatial Analysis in Descriptive Models of Renewable Resource Management,” Swiss Journal of Economics and Statistics **141** (III), pp. 331-354, 2005.
117. D. Ludwig, S. Carpenter, W. Brock “Uncertainty in Discount Models and Environmental Accounting,” Ecology and Society, 10(2):13, 2005,  
<http://www.ecologyandsociety.org/vol110/iss2/art13/>
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119. With S. Durlauf, “Macroeconomics and Model Uncertainty,” in David Colander, ed., Post-Walrasian Macroeconomics: Beyond the Dynamic Stochastic General Equilibrium Model, Cambridge University Press: New York, 116-134, 2006.
120. With S. Durlauf, “Social Interactions and Macroeconomics,” in David Colander, ed., Post-Walrasian Macroeconomics: Beyond the Dynamic Stochastic General Equilibrium Model, Cambridge University Press: New York, 97-115, 2006.
121. S. Carpenter, W. Brock, “Rising Variance: A Leading Indicator of Ecological Transition,” Ecology Letters, 9: 311-318, 2006.
122. With S. Carpenter, “Variance as a Leading Indicator of Regime Shift in Ecosystem Services,” Ecology and Society **11**(2): 9, 2006, online at  
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123. “Tipping Points, Abrupt Opinion Changes, and Punctuated Policy Change,” in Repetto, R., ed., Punctuated Equilibrium and the Dynamics of U.S. Environmental Policy, Yale University Press: New Haven, CT, Chapter 3, pp. 47-77. 2006.
124. “Profiling Problems With Partially Identified Structure,” Economic Journal **116**, F427-F440, November 2006.
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126. With P. Dindo and C. Hommes, “Adaptive Rational Expectations,” International Journal of Economic Theory, 2(3/4), 2006, 241-278.
127. With S. Taylor, “Economic Growth and the Environment: A Review of Theory and Empirics,” in S. Durlauf and P. Aghion, Editors, Handbook of Economic Growth, Amsterdam: North Holland, Chapter 28, 2005, 1750-1821.

128. With S. Durlauf and K. West, "Model Uncertainty and Policy Evaluation: Some Theory and Empirics," Journal of Econometrics, 136 (2), 2007, 629-664.
129. With D. Dechert, "Multi-sector Models," in L. Blume, S. Durlauf, eds., The New Palgrave New York: Macmillan, 2008.
130. With S. Durlauf, "Identification of Binary Choice Models with Social Interactions," Journal of Econometrics, 140, 2007, 52-75.
131. W. Dechert, S. O'Donnell, W. Brock, "Bayes' Learning of Unknown Parameters," Journal of Difference Equations and Applications, 13 (2-3), 2007, 121-133.
132. With S. Durlauf, J. Nason, and G. Rondina, "Simple versus Optimal Rules as Guides to Policy," Journal of Monetary Economics, 54, 2007, 1372-1396.
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134. With S. Durlauf, "Exchangeability," "Microeconomics," "Optimization," "Principal-Agent Problems," and "Prisoner's Dilemma," for International Encyclopedia of the Social Sciences, W. Darity, Ed. New York: Macmillan, 2007.
135. With A. Xepapadeas, "Diffusion-Induced Instability and Pattern Formation in Infinite Horizon Recursive Optimal Control," Journal of Economic Dynamics and Control, 2008, 32, 2745-2787.
136. With D. Colander, "Complexity, Pedagogy, and the Economics of Muddling Through," in M. Salzano, A. Kirman, (Eds.), Economics: Complex Windows, Springer: Milan, 2004, 25-42.
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139. R. Biggs, S. Carpenter, W. Brock, "Turning back from the brink: Detecting an impending regime shift in time to avert it." Proceedings of the National Academy of Sciences 106(3): 826-831, 2009.
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## **Miscellaneous**

"The Economics of Biodiversity and Ecosystem Services" (C. Perrings, S. Baumgärtner, W. Brock, K. Chopra, M. Conte, C. Costello, A. Duraiappah, A.P. Kinzig, U. Pascual, S. Polasky, J. Tschirhart) (2009), in S. Naeem, D.E. Bunker, A. Hector, M. Loreau, and A. Xepapadeas (Eds.), Biodiversity, Ecosystem Functioning, and Human Wellbeing: An Ecological and Economic Perspective, Oxford University Press.

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## **Books:**

1. A.G. Malliaris with contributions by W.A. Brock, Stochastic Methods in Economics and Finance, North Holland 1981, 303 pages.
2. With D.S. Evans, The Economics of Small Businesses: Their Role and Regulation in the U.S. Economy, New York and London: Holmes and Myers 1986, 215 pages.
3. With A.G. Malliaris, Differential Equations, Stability and Chaos in Dynamic Economics, North-Holland 1989, 389 pages.
4. S. P. Magee, W. Brock, and L. Young, Black Hole Tariffs and Endogenous Trade Policy; Political Economy in General Equilibrium, Cambridge University Press 1989, 438 pages.
5. With D. Hsieh and B. LeBaron, Nonlinear Dynamics, Chaos, and Instability: Statistical Theory and Economic Evidence, Cambridge, MA: MIT Press 1991, 328 pages.
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7. O'Brien, M., Bentley, A., Brock, W., (2019), The Importance of Small Decisions: How Culture Evolves, MIT Press.

## **Manuscripts:**

1. "A Simple Model of Money and Growth," Report 7221, Center for Mathematical Studies in Business and Economics, University of Chicago, May 1972, 50 pages.

2. "Some Results on Dynamic Integrability," Report 7551, Center for Mathematical Studies in Business and Economics, University of Chicago, December 1975, 24 pages.
3. "Introduction to Stochastic Calculus: A User's Manual," The University of Chicago, April 1976, mimeographed, 62 pages.
4. With W. D. Dechert, "The Generalized Maximum Principle," Department of Economics, UW-Madison, SSRI Working Paper No. 8316.
5. "Nonlinearity in Finance and Economics," April 1987.
6. With E. Baek, "A General Test for Nonlinear Granger Causality: Bivariate Model," 1991.
7. With S. N. Durlauf, "Income and Wage Inequality in the Post Fordist Era," Department of Economics, The University of Wisconsin, Madison, 1995b.
8. "Some Mathematical Tools for Analyzing Complex-Nonlinear Systems," SSRI Working Paper 2020, 2000
9. With S. Taylor, "The Kindergarten Rule of Sustainable Growth," Department of Economics, UW-Madison, SSRI Working Paper No. 2003-08.
10. Anderson, E., Brock, W., Hansen, L., Sanstad, A., 2014, "Robust analytical and computational explorations of coupled economic-climate models with carbon-climate response," RDCEP W.P. 13-05, January.
11. Cai, Y., W. Brock, and A. Xepapadeas. 2016. Climate Change Economics and Heat Transport Across the Globe: Spatial-DSICE. In 2017 Allied Social Science Association (ASSA) Annual Meeting, January 6-8, 2017, Chicago, Illinois, 251833. Agricultural and Applied Economics Association
12. Cai, Y., Brock, W., Xepapadeas, A., 2018, "Optimal Regional Climate Policy Under "Egalitarian vs "Conservative" Welfare Criteria," OSU Working Paper.
13. Cai, Yongyang, William Brock, Anastasios Xepapadeas, and Kenneth Judd, 2018, "Climate Policy under Cooperation and Competition between Regions with Spatial Heat Transport," NBER working paper 24473.
14. Brock, W., Chen, B., Durlauf, S., Weber, S., August 2022, Everybody's Talkin' at Me: Levels of majority language acquisition by minority language speakers, NBER w.p. 30410.

**Other Items:**

MD Interview: Professor William A. Brock, interviewed by Michael Woodford, Macroeconomic Dynamics, 4 (1), March 2000, 128-138.

William A. “Buz” Brock, Chapter 6 of The Changing Face of Economics: Conversations With Cutting Edge Economists, David Colander, Richard P. F. Holt and J. Barkley Rosser, Editors, Ann Arbor: University of Michigan Press, pp. 157-182, 2004.

Bruce Mizrach (2005) “A Video Interview of Buz Brock”, Studies in Nonlinear Dynamics & Econometrics: Vol. 9: No. 1, Article 1. <http://www.bepress.com/snede/vol9/iss1/art1>

This article is a video presentation of an interview with Buz Brock at the 12<sup>th</sup> SNDE conference in Atlanta Georgia on March 12, 2004. The interview includes 15 questions on topics ranging from nonlinear dynamics, ecological modeling and heterogeneous agents.

**Invited Lectureships and Formal Summer Research:**

Summer 1971: I participated for six weeks in a workshop at the University of California at Berkeley organized by Professor Roy Radner.

Summer 1972: I delivered a series of lectures at the Symposium on Mathematical Methods of Economics organized by the Mathematical Institute of Warsaw, Poland, June 5-15th.

Summer 1972: Visiting appointment to the Faculty of Economics of the Australian National University at Canberra, Australia, June through September. I gave lectures and staff seminars on my work and the work of others in my field.

Summer 1973: Participated in a Workshop organized by Robert Barro and Stanley Fischer at the University of California at Berkeley, June through August.

Fall 1973: Visiting appointment to the Department of Economics at the University of Rochester, Rochester, New York. I taught a graduate course in General Equilibrium Theory.

Summer 1974: I participated in a conference organized by Gerard Debreu at the University of California at Berkeley, June through August.

Summer 1975: I participated in a conference organized by Gerard Debreu at the University of California at Berkeley, June through August.

Summer 1976: Visiting appointment to the Faculty of Economics of the Australian National University at Canberra, Australia; June through September. I gave lectures on my field at A.N.U. and other universities in Australia and the Far East.

Winter 1978: Adjunct Professor, University of Houston, Texas. At Houston I gave a set of lectures on recent applications of optimal control theory to economic problems such as

speculation in exhaustible resource stocks.

Summer 1979: Visiting Staff Member at NBER West, Palo Alto. I gave a lecture on optimal stopping theory at NBER West.

March 1980, 1982: Distinguished Lecturer, The University of Southern California.

March 1983 and November 1983: Lecture Series, Graduate School of Business, The University of Texas at Austin.

January-March 1984, 1986: Visiting Professor of Economics, The University of California at San Diego.

January-March 1987: Visiting Professor of Economics and Finance, Graduate School of Business, Stanford University.

Summer 1989: Jarden Morgan Visiting Fellow, Victoria University of Wellington, New Zealand.

1989 - 2002: External Professor, Santa Fe Institute, Santa Fe, New Mexico.

### **Associate Editorships:**

1. Journal of Economic Theory, Spring 1972 - Summer 2006.
2. International Economic Review, October 1972 - August 1999.
3. International Journal of Bifurcations and Chaos, 1990-2008.
4. Journal of Nonlinear Science, 1990 - 2003.

### **Professional Activities:**

Chairman, Session on Economic Growth and Program Committee member at Meetings of the Econometric Society, New Orleans, December 1971.

Session organizer for "Dynamic Economics" Summer Meetings of the Econometric Society, August 1976.

Session organizer for "Turnpike Theory" for "Optimization Days," Montreal, May 21-22, 1980.

Program Committee for Summer Meetings of the Econometric Society, 1982, 1984, 1992.

Advisory Board of Editors, Advanced Textbook in Economics Series, North-Holland Publishing Co., (invited September 1983).

Program Committee, World Congress of The Econometric Society, 1985.

Research Briefing Panel for the Analysis of Nonlinear Systems, National Research Council,

USA, 1987.

Santa Fe Institute Workshop " Evolutionary Paths in the Global Economy," 1987.

Santa Fe Institute, External Faculty Member of the SFI 1987 - 2002.

Class Membership Committee, U.S. National Academy of Sciences, 2000, 2002, 2006.

Carty Award Committee Member, NAS, 2017

Board of Science, Resilience Alliance, 2000 - 2005.

Brookings Panel on Economic Activity, 2003.

Researcher: The Center for Robust Decision Making on Climate and Energy Policy, The University of Chicago (since 2010).

I have served as outside reviewer for Ph.D. theses for countries outside the USA, grant reviewer for NSF and the Canada Council, outside advisor for numerous University Departments, referee for numerous journals, reviewer for Mathematical Reviews and Zentralblatt fur Mathematik, editorial consultant for American Economic Review, and reviewer for book publishers. The over one hundred lectures that I have given include lectures in Poland, Belgium, France, Italy, Mexico, Canada, Japan, Australia, England, Sweden, Norway, Uruguay, Brazil, the Netherlands, Turkey, and Austria.

### **Consulting and Other Experience:**

I testified at an FTC hearing in May 1978. I was on the Board of Directors of Chicago Area Research Associates, Inc., (which has been inactive since the mid 1980's). I worked on a study of protectionism with S.P. Magee for Booz-Allan and Hamilton, the consulting firm. During 1980-1983 I consulted for the EPA, DOJ, and SBA. During the late 80's I did some consulting on problems in the New Zealand economy.