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# Bibliography

- ACEMOGLU, D., P. AGHION, L. BURSZTYN, AND D. HEMOUS (2009): “The environment and directed technical change,” Tech. Rep. 15451, NBER Working Paper Series.
- AGHION, P., N. BLOOM, R. BLUNDELL, R. GRIFFITH, AND P. HOWITT (2005): “Competition and innovation: an inverted-U relationship,” *Quarterly Journal of Economics*, 120, 701–728.
- AGHION, P., C. HARRIS, P. HOWITT, AND J. VICKERS (2001): “Competition, imitation and growth with a step-by-step innovation,” *Review of Economic Studies*, 68, 467–492.
- AGHION, P. AND P. HOWITT (1992): “A model of growth through creative destruction,” *Econometrica*, 60, 323–351.
- (1998): *Endogenous Growth Theory*, Cambridge, MA: MIT Press.
- ALESSIE, R. AND A. KAPTEYN (1991): “Habit formation, interdependent preferences and demographic effects in the almost ideal demand system,” *Economic Journal*, 101, 404–419.
- ANDERSEN, E. (1994): *Evolutionary Economics: Post-Schumpeterian Contributions*, London: Pinter.
- ARGOTE, L. AND D. EPPLE (1990): “Learning curves in manufacturing,” *Science*, 247, 920–924.

- ARROW, K. J. (1962): "The economic implications of learning by doing," *Review of Economic Studies*, 29, 155–173.
- ARROW, K. J. AND A. C. FISHER (1974): "Environmental preservation, uncertainty, and irreversibility," *Quarterly Journal of Economics*, 88, 312–319.
- ARTHUR, B. (1989): "Competing technologies, increasing returns, and lock-in by historical events," *Economic Journal*, 99, 116–131.
- (1994): *Increasing returns and path dependence in the economy*, Ann Arbor: University of Michigan Press.
- ARTHUR, W., Y. ERMOLIEV, AND Y. KANIOVSKI (1987): "Path-dependent processes and the emergence of macrostructure," *European Journal of Operation Research*, 30, 294–303.
- BANERJEE, A. V. (1992): "A Simple Model of Herd Behavior," *Quarterly Journal of Economics*, 107, 797–817.
- BARLEVY, G. (2004): "The cost of business cycles under endogenous growth," *American Economic Review*, 94, 964–990.
- BASS, F. M. (1969): "A new product growth for model consumer durables," *Management Science*, 15, 215–227.
- BENOIT, J. (1985): "Innovation and imitation in a duopoly," *Review of Economic Studies*, 52, 99–106.
- BIKHCHANDANI, S., D. HIRSHLEIFER, AND I. WELCH (1992): "A theory of fads, fashion, custom and cultural change as informational cascades," *Journal of Political Economy*, 100, 992–1026.

- BLUME, L. E. AND S. N. DURLAUF, eds. (2006): *The economy as an evolving complex system, III*, Santa Fe Institute, Studies in the sciences of complexity, Oxford University Press.
- BOSETTI, V., C. CARRARO, R. DUVAL, A. SGOBBI, AND M. TAVONI (2009): “The role of *R&D* and technology diffusion in climate change mitigation: new perspectives using the WITCH model,” Tech. Rep. 664, Department Working Paper, OECD.
- BROCK, W. AND S. DURLAUF (2001): “Discrete choice with social interactions,” *Review of Economic Studies*, 68, 235–260.
- (2002): “A Multinomial Choice Model with Neighborhood Effects,” *American Economic Review*, 92, 298–303.
- (2006): “Multinomial Choice with Social Interactions,” in Blume and Durlauf (2006), 175–206.
- (2010): “Adoption curves and social interactions,” *Journal of the European Economic Society*, 8, 232–251.
- BROCK, W. AND C. HOMMES (1997): “A Rational Route to Randomness,” *Econometrica*, 65, 1059–1095.
- CEFIS, E. AND L. ORSENIGO (2001): “The persistence of innovative activities: a cross-countries and cross-sectors comparative analysis,” *Research Policy*, 30, 1139–1158.
- CHIU, Y., H. LAI, T. LEE, AND Y. LIAW (2008): “Technological diversification, complementary assets and performance,” *Technological Forecasting and Social Change*, 75, 875–892.
- CONLISK, J. (1980): “Costly optimizers versus cheap imitators,” *Journal of Economic Behavior and Organization*, 1, 275–293.
- (1996): “Why bounded rationality?” *Journal of Economic Literature*, 34, 669–700.

- DASGUPTA, P. AND E. MASKIN (1987): “The simple economics of research portfolios,” *Economic Journal*, 97, 581–595.
- DAVID, P. AND D. FORAY (1994): “Dynamics of Competitive Technology Diffusion through Local Network Structures,” in *Evolutionary Economics and Chaos Theory*, ed. by L. Leydesdorff and P. van den Besselaar, London: Pinter, 63–78.
- DAVID, P. A. (1985): “Clio and the economics of QWERTY,” *American Economic Review*, 75, 332–337.
- DIKS, C., C. HOMMES, V. PANCHENKO, AND R. VAN DER WEIDE (2008): “E&F Chaos: a user friendly software package for nonlinear economic dynamics,” *Computational Economics*, 32, 221–244.
- DIKS, C. AND R. VAN DER WEIDE (2005): “Herding, a-synchronous updating and heterogeneity in memory in a CBS,” *Journal of Economic Dynamics and Control.*, 29, 741–763.
- DIXIT, A. K. AND R. S. PINDYCK (1994): *Investment under Uncertainty*, Princeton, NJ: Princeton University Press.
- DOPFER, K. (2005): *The Evolutionary Foundation of Economics*, Cambridge, England: Cambridge University Press.
- DOSI, G. (1982): “Technological paradigms and technological trajectories: A suggested interpretation of the determinants and directions of technical change,” *Research Policy*, 11, 147–162.
- (1988): “Sources, procedures and microeconomic effects of innovation,” *Journal of Economic Literature*, 26, 1120–1171.
- DOSI, G., C. FREEMAN, R. NELSON, G. SILVERBERG, AND L. SOETE, eds. (1988): *Technical Change and Economic Theory*, London: Pinter.

- DOSI, G., L. MARENGO, AND G. FAGIOLO (2005): “Learning in evolutionary environments,” in Dopfer (2005), chap. 9, 255–338.
- ETHIRAJ, S. K. AND D. LEVINTHAL (2004): “Modularity and Innovation in complex systems,” *Management Science*, 50, 159–173.
- FABER, A. AND K. FRENKEN (2009): “Models in evolutionary economics and environmental policy: towards an evolutionary environmental economics,” *Technological Forecasting and Social Change*, 76, 462–470.
- FISCHER, C. AND R. G. NEWELL (2008): “Environmental and technology policies for climate mitigation,” *Journal of Environmental Economics and Management*, 55, 142–162.
- FLEMING, L. (2001): “Recombinant uncertainty in technological search.” *Management Science*, 47, 117–132.
- FRANK, R. H. (2005): “Positional externalities cause large and preventable welfare losses,” *American Economic Review*, 95, 137–141.
- FRENKEN, K., P. P. SAVIOTTI, AND M. TROMMETTER (1999): “Variety and niche creation in aircraft, helicopters, motorcycles and microcomputers,” *Research Policy*, 28, 469–488.
- GEELS, F. W. (2002): “Technological transitions as evolutionary reconfiguration processes: A multi-level perspective and a case-study,” *Research Policy*, 31, 1257–1274.
- GEROSKI, P. A. (2000): “Models of technology diffusion,” *Research Policy*, 29, 603–625.
- GROSSMAN, G. M. AND E. HELPMAN (1991): *Innovation and growth in the global economy*, Cambridge, MA: MIT Press.
- GROSSMAN, S. G. AND J. STIGLITZ (1976): “Information and competitive price systems,” *American Economic Review Papers and Proceedings*, 66, 246–253.

- HENS, T. AND K. R. SCHENK-HOPPÉ, eds. (2009): *Handbook of financial markets: dynamics and evolution*, Handbooks in Finance, Amsterdam: North-Holland.
- HOMMES, C. (1994): “Dynamics of the cobweb model with adaptive expectations and nonlinear supply and demand,” *Journal of Economic Behavior and Organization*, 24, 315–335.
- (2006): “Heterogeneous Agent Models in Economics and Finance,” in Tesfatsion and Judd (2006), chap. 23, 1109–1186.
- HOMMES, C., H. HUANG, AND D. WANG (2005): “A robust rational route to randomness in a simple asset pricing model,” *Journal of Economic Dynamics and Control*, 29, 1043–1072.
- HOMMES, C. AND F. WAGENER (2009): “Complex evolutionary systems in behavioral finance,” in Hens and Schenk-Hoppé (2009), chap. 4, 217–265.
- IWAI, K. (1984): “Schumpeterian dynamics, part I: an evolutionary model of innovation and imitation,” *Journal of Economic Behavior and Organization*, 5, 159–190.
- JABER, J., S. ODEH, AND S. PROBERT (2003): “Integrated PV and gas-turbine system for satisfying peak-demands,” *Applied Energy*, 76, 305–319.
- JOVANOVIĆ, B. AND G. MACDONALD (1994): “The life cycle of a competitive industry,” *Journal of Political Economy*, 102, 322–347.
- KATZ, M. L. AND C. SHAPIRO (1985): “Network externalities, competition and compatibility,” *American Economic Review*, 75, 424–440.
- KIRMAN, A. (1993): “Ants, rationality and recruitment,” *Quarterly Journal of Economics*, 108, 137–156.

- KOH, H. AND C. L. MAGEE (2006): “A functional approach for studying technological progress: application to information technology,” *Technological Forecasting and Social Change*, 73, 1061–1083.
- LI, T. Y. AND J. YORKE (1975): “Period three implies chaos,” *American Mathematical Monthly*, 87, 985–992.
- LIPP, J. (2007): “Lessons for effective renewable electricity policy from Denmark, Germany and the United Kingdom,” *Energy Policy*, 35, 5481–5495.
- LLERENA, P. AND V. OLTRA (2002): “Diversity of innovative strategy as a source of technological performance,” *Structural Change and Economic Dynamics*, 13, 179–201.
- MALERBA, F. (1992): “Learning by firms and incremental technical change,” *Economic Journal*, 102, 845–859.
- MANSFIELD, E. (1961): “Technical change and the rate of imitation,” *Econometrica*, 29, 741–766.
- (1988): *Microeconomics*, London: Norton.
- MANSKI, C. F. (2006): “Social learning and the adoption of innovations,” in Blume and Durlauf (2006), 31–47.
- MARCH, J. G. (1991): “Exploration and exploitation in organizational learning,” *Organization Science*, 2, 71–87.
- MARKOWITZ, H. (1952): “Portfolio selection,” *Journal of Finance*, 7, 77–91.
- MCKELVEY, R. AND T. PALFREY (1995): “Quantal response equilibria for normal form games,” *Games and Economic Behavior*, 10, 6–38.
- MILGROM, P. AND J. ROBERTS (1990): “Rationalizability, learning, and equilibrium in games with strategic complementarities,” *Econometrica*, 58, 1255–1277.



- NELSON, R. R. (1988): “Modelling the connections in the cross section between technical progress and R&D intensity,” *Rand Journal of Economics*, 15, 546–554.
- NELSON, R. R. AND S. G. WINTER (1982): *An Evolutionary Theory of Economic Change*, Cambridge, MA: Harvard University Press.
- PENROSE, E. (1959): *The theory of the growth of the firm*, New York: Wiley.
- POTTS, J. (2000): *The new evolutionary microeconomics: complexity, competence and adaptive behavior*, Cheltenham: Edward Elgar Publishing.
- RESACT (2000): “Act on granting priority to renewable energy sources,” *Federal Ministry for the environment, nature conservation and nuclear safety (BMU)*, <http://www.wind-works.org/FeedLaws/Germany/GermanEEG2000.pdf>.
- ROMER, P. M. (1986): “Increasing returns and long-run growth,” *Journal of Political Economy*, 94, 1002–1037.
- (1990): “Endogenous technological change,” *Journal of Political Economy*, 98, 71–102.
- SCHUMPETER, J. A. (1934): *The Theory of Economic Development*, Cambridge, MA: Harvard University Press.
- (1942): *Capitalism, socialism and democracy*, New York: Harper and Row.
- SETHI, R. AND R. FRANKE (1995): “Behavioural heterogeneity under evolutionary pressure: macroeconomic implications of costly optimization,” *Economic Journal*, 105, 583–600.
- SHARPE, W. (1964): “Capital asset prices: a theory of market equilibrium under conditions of risk,” *Journal of Finance*, 19, 425–442.
- SIMON, H. A. (1957): *Models of Man. Social and Rational*, New York: Wiley.

- SMALLWOOD, D. E. AND J. CONLISK (1979): "Product quality in markets where consumers are imperfectly informed," *Quarterly Journal of Economics*, 93, 1–23.
- SOETE, L. AND R. TURNER (1995): "Behavioural heterogeneity under evolutionary pressure: macroeconomic implications of costly optimization," *Economic Journal*, 94, 612–623.
- SOLOW, R. M. (1956): "A contribution to the theory of economic growth," *Quarterly Journal of Economics*, 70, 65–94.
- SPENCE, M. (1984): "Cost reduction, competition and industry performance," *Econometrica*, 52, 101–121.
- STERN, N. H. (2007): *The economics of climate change: the Stern Review*, Cambridge, England: Cambridge University Press.
- STIRLING, A. (2007): "A general framework for analyzing diversity in science, technology and society," *J. of the Royal. Society Interface*, 4, 707–719.
- TESFATSION, L. AND K. L. JUDD, eds. (2006): *Agent-based Computational Economics*, vol. 2 of *Handbook of Computational Economics*, Amsterdam: North-Holland.
- VAN DEN BERGH, J. C. J. M. (2007): "Evolutionary thinking in environmental economics," *Journal of Evolutionary Economics*, 17, 521–549.
- (2008): "Optimal diversity: increasing returns versus recombinant innovation," *Journal of Economic Behavior and Organization*, 68, 565–580.
- VAN DEN BERGH, J. C. J. M. AND F. BRUINSMA (2008): *Managing the transition to renewable energy*, Edward Elgar Publishing.
- VAN DEN HEUVEL, S. T. A. AND J. C. J. M. VAN DEN BERGH (2008): "Multilevel assessment of diversity, innovation and selection in the solar photovoltaic industry," *Structural Change and Economic Dynamics*, 20, 50–60.

- WEITZMAN, M. L. (1992): “On diversity,” *Quarterly Journal of Economics*, 107, 363–405.
- YOUNG, H. P. (2009): “Innovation diffusion in heterogeneous populations: contagion, social influence, and social learning,” *American Economic Review*, 99, 1899–1924.
- ZEPPINI, P. AND J. C. J. M. VAN DEN BERGH (2008): “Optimal diversity in investments with recombinant innovation,” Tech. Rep. 2008-12, CeNDEF, University of Amsterdam.
- (2011): “Competing Recombinant Technologies for Environmental Innovation: Extending Arthur’s Model of Lock-In,” *Industry & Innovation*, 18, 317–334.