

Post-neoclassical Economics

A review and critique of its
applicability to ICT

Alain Bourdeau de Fontenay (CITI)
Jonathan Liebenau (LSE & CITI) □



The problem

- Perceived widening gap between mainstream economics & critical issues
- Reluctance of neoclassicists to accommodate new methods
- Newly articulated problems that are solvable with alternative approaches



objective



- Introduce heterodox approaches & illustrate potential roles in ICT economics
- Show intellectual heritage, inter-linkages
- Argue for their utility to address both longstanding and new problems

High switching cost



- But ... not as high as people might think
- We will show what that cost is: what needs to be abandoned, what loss it represents, and what it costs to acquire the new approaches

Chronology



- “Classical”
 - Smith
- “Neoclassical”
 - Marshall
 - Knight, Sraffa & Young
- of which “mainstream economics”
 - Friedman, Becker
 - Stigler, Alchian

Post-neoclassical (or “heterodox”) economics



- Evolutionary economics (e.g., Nelson and Winter)
- New institutional economics (Williamson, Hart, Coase, North)
- Behavioral economics (Kahneman, Thaler, Frank, Ariely)
- Experimental economics (Vernon Smith, Ostrom, Ariely)
- Economic sociology (White, Fliegstein, Granovetter, Swedberg)
- Neuroeconomics (Camerer, Zak)
- Economic history (Chandler, Scranton)
- Complexity theory (Cherry and Bauer)
- Real options (Noam and Alleman)

Marshall & moves from classical to neoclassical



- Place, aggregation & industry structure
- Making economics a “science”
 - Fascination with mathematical economics
 - Discreet and abstracted analysis
 - Friedman: “truly important and significant hypotheses will be found to have ‘assumptions’ that are wildly inaccurate descriptive representations of reality, and, in general, the more significant the theory, the more unrealistic the assumptions” (1953)

Knight as pivotal figure



- Market clearing
- Uncertainty
- Theory of the firm
- Prices, information and competition

- Knight can be a bridge figure; lowering switching costs

Knight's uncertainty



With uncertainty entirely absent, every individual being in possession of perfect knowledge of the situation, there would be no occasion for anything of the nature of responsible management or control of productive activity. Even marketing transactions in any realistic sense would not be found. The flow of raw materials and productive services to the consumer would be entirely automatic. (1921)

Knight's uncertainty



- Methodological individualism: focus on individual's decision, not average or representative
- Human judgment as unit of analysis-- idiosyncratic, not typical situations
- Link to market clearing:
 - Requires learning; historical time
 - Costly to communicate; must be translated into a probability-based market process (e.g. insurance)
 - Cannot be assumed to reach neoclassical market clearing equilibrium (except in the long-run)

Knight's uncertainty as umbrella:



- Non-mainstream neoclassical models, e.g.,
 - Schumpeter's entrepreneur-based innovation
 - Externalities: Marshall, Young (and Romer)
 - Coase's firm
- Post-neoclassical approaches, e.g.,
 - Evolutionary economics
 - New institutional economics (NIE)
 - Behavioral, experimental economics, neuroeconomics
 - Complexity theory
 - Real options
 - Incorporates Mandelbrot/Taleb "highly improbable"

Core neoclassical doctrine



- Rationality
- Self-interest
- Optimization
- Abstraction from context
- Externalities (and technology-focus)
- Allocation as a static problem



Bridging doctrines

- Uncertainty (from Knight)
- Problems of exogeneity (Sraffa)
- Where dynamic analysis fits (Knight)
- Transactions (Coase)
- Theory of the firm (Williamson)
- Innovation (Schumpeter)



Comparisons

Core	Bridge	Alternative
Rationality	Uncertainty (Knight)	Risk; “predictable irrationality”
Context free	Sraffa & questions of endogeneity	Economic sociology
Externalities	Team	Institutions (NIE)
Static models	Dynamic	Evolutionary

“Lamp post” questions for ICT



- Pricing
- Industry structure models
- Interconnection
- Static financing

QuickTime™ and a
TIFF (LZW) decompressor
are needed to see this picture.

“Our” problems



- Networks
- Dynamic analysis of culture & institutions
- Technology as endogenous
- Markets & exchanges
 - Residual rights, vertical integration & competition
- “New” theories of the firm
- Agency, moral hazard and other transaction problems; governance
 - Hold-up and access problems

Examples of previous uses



- New institutional economics (Coase): spectrum auctions
- Beh. & exp. econ. (Banks): spectrum auctions
- Behavioral economics (Kahneman & Tversky): some discrete choice demand analyses
- Behavioral & inst. economics (Noam): open spectrum access

Applications 1



- Real options (Alleman and Noam) and the incumbent's costs
- New institutional economics (transaction costs) and regulated interconnection benchmark contracts
- Evolutionary economics (e.g. Henderson and Clark; Christensen and Bower; Bourdeau de Fontenay and Bourdeau de Fontenay) and peer-to-peer and file sharing
- Institutional economics (e.g. Noam) and complexity theory (Cherry) and common carriage; network neutrality

Applications 2



- Economic sociology (White): interconnection, peering, ICT competition
- Behavioral economics (Shiller) & Econ. of the highly improbable (Mandelbrot and Hudson; Taleb): investment; the dot com bubble
- Innovation economics/evolutionary econ. (Bourdeau de Fontenay & Liebenau; ITIF) regulation & judicial treatment of ICT competition
- New institutional economics – residual rights (Bourdeau de Fontenay): peer-to-peer

Applicability of alternatives



- P-2-P
- Infrastructure & exchange
- Regulation & market shaping
- Networks, scale & scope

Case 1

p-2-p



- Institutional issues: who is harmed by file exchange, and exactly how/how much?
- What alternative business models could work
- Inability to transform is common: changing ingrained behaviors & beliefs deserves lessons from evolutionary & institutional economics

“new” economic questions for p-2-p



- What is endogenous?
 - Technology?
 - Content?
 - Delivery mechanisms?
 - Pricing policies?
- Where to take *ceteris paribus*
 - Musicians' income?
 - Producers' &/or distributors' income?
- Which institutions constitute the core?
- What should the economics of innovation be?

Case 2 infrastructure & exchange



- What constitutes “the infrastructure”?
 - Backbone? Last mile? Facilities only?
- What constitutes “the market”?
 - Trades in access & services
 - Consumers & their behaviors
- Critical nodes, the control of knowledge & “too big to fail”
 - Infrastructure as resource
 - The value of sunk costs
 - The status of hidden value (e.g. rights-of-way)

exchange



- Coase’s lighthouse as infrastructure
- Applied to municipal WiFi; digital divide argument
 - Identifying need for infrastructure not unambiguous
 - Various solutions to public facility provision
 - Geography of local needs/overall transaction costs
 - Which social goals merit infrastructure finance?

Case 3 regulation & market shaping



- Intermediate & two-sided markets
 - Institutions and behaviors shape the scope of an industry--old sectoral notions frequently transform
 - Confusions exogenous vs. endogenous
- Transitions (e.g. monopoly to “competition”)
- Gaming systems and exercising options

Case 4 networks, scale & scope



Summary



- In applying post-neoclassical approaches to ICT we see value in demonstrating bridges to neoclassical problem-setting and techniques
- Knight as pivotal figure
- New economics of ICT re-casts our agenda

discussion



An illustrative bibliography



- Alchian, A. A. 1950. Uncertainty, Evolution and Economic Theory. *The Journal of Political Economy*, 58(3): 211-221.
- Alchian, A. A., & Demsetz, H. 1972. Production, Information Costs, and Economic organization. *The American Economic Review*, 62.
- Alleman, J., & Noam, E. M. (Eds.). 1999. *The New Investment Theory of Real Options and its Implications for Telecommunications Economics*. Boston: Kluwer.
- Ariely, Dan 2008. *Predictably Irrational*. New York: HarperCollins
- Banks, J., Olson, M., Porter, D., Rassenti, S., & Smith, V. 2002. Theory, Experiment and the Federal Communications Commission Spectrum Auctions. *Journal of Economic Behavior & Organization*, 51: 303-350.
- Baumol, W. J. 1962. On the Theory of Expansion of the Firm. *The American Economic Review*, 52(5): 1078-1087.
- Baumol, W. J. 1971. Economics of Athenian Drama: Its Relevance for the Arts in a Small City Today. *The Quarterly Journal of Economics*, 85(3): 365-376.
- Becker, G. S. 1962. Irrational Behavior and Economic Theory. *The Journal of Political Economy*, 70(1): 1-13.
- Becker, G. S., & Murphy, K. M. 2000. *Social Economics : Market Behavior in a Social Environment*. Cambridge, MA.: Harvard University Press.
- Benabou, R., & Tirole, J. 2003. Intrinsic and Extrinsic Motivation. *Review of Economic Studies*, 70: 489-520.
- Bourdeau de Fontenay, A., & Beltran, F. 2008. *Inequality and Economic Growth: Should we be Concerned by the Digital Divide?* Auckland: University of Auckland.
- Bourdeau de Fontenay, A., & Bourdeau de Fontenay, E. Forthcoming. "You can lead a horse to water but you can't make it drink": The Music Industry and Peer-to-Peer. In W. Lehr, & L. Puppillo (Eds.), *Internet Policy and Economics: Challenges and Perspectives*. New York: Springer.
- Bresnahan, T. F., & Trajtenberg, M. 1995. General Purpose Technologies - Engines of Growth. *Journal of Econometrics*, 65(1): 83-108.
- Camerer, C. F., Loewenstein, G., & Prelec, D. 2005. Neuroeconomics : How Neuroscience Can Inform Economics. *Journal of Economic Literature*, 43: 9-64.
- Caplin, A., & Schotter, A. (Eds.). 2008. *The Foundations of Positive and Normative Economics: A Handbook*. New York: Oxford University Press.
- Chandler, A. D. J. 1994. *Scale and Scope : The Dynamics of Industrial Capitalism*. Cambridge, MA: Harvard University Press.
- Cherry, B. A. 2007. The Telecommunications Economy and Regulation As Coevolving Complex Adaptive Systems: Implications for Federalism. *Federal Communications Law Journal*.
- Cherry, B. 2007. Analyzing the Network Neutrality Debate Through Awareness of Agenda Denial. *International Journal of Communication*, 1: 580-594.
- Christensen, C. 1993. The Rigid Disk Drive Industry: A History of Commercial and Technological Turbulence. *The Business History Review*, 67(4): 531-588.
- Christensen, C. M., & Bower, J. L. 1996. Customer Power, Strategic Investment, and the Failure of Leading Firms. *Strategic Management Journal*, 17(3): 197-218.

- Coase, R. 1937. The Nature of the Firm. *Economica*, 4 (New Series)(16): 386-405.
- Coase, R. H. 1947. The Origin of the Monopoly of Broadcasting in Great Britain. *Economica*, 14(55): 189-210.
- Coase, R. H. 1948. Wire Broadcasting in Great Britain. *Economica*, 15(59): 194-220.
- Coase, R. H. 1954. The Development of the British Television Service. *Land Economics*, 30(3): 207-222.
- Coase, R. H. 1959. The Federal Communications Commission. *Journal of Law and Economics*, 2: 1-40.
- Coase, R. H. 1960. The Problem of Social Cost. *Journal of Law and Economics*, 3: 1-44.
- Coase, R. H. 1966. The Economics of Broadcasting and Government Policy. *The American Economic Review*, 56(1/2): 440-447.
- Coase, R. 1998. The New Institutional Economics. *The American Economic Review*, 88(2): 72-74. Frank, R. H. 1997. The Frame of Reference as a Public Good. *The Economic Journal*, 107(445): 1832-1847.
- Colander, D., Holt, R. P. F., & Rosser, J. B. J. 2004. *The Changing Face of Economics: Conversations with Cutting Edge Economists*. Ann Arbor, MI, USA: The University of Michigan Press.
- Coleman, J. S. 1984. Introducing Social Structure in Economic Analysis. *The American Economic Review*, 74(2): 84-88.
- Cyert, R. M., & March, J. G. 1963. *A Behavioral Theory of the Firm*. Englewood Cliffs, NJ: Prentice Hall.
- David, P. A. 1990. The Dynamo and the Computer: An Historical Perspective on the Modern Productivity Paradox. *The American Economic Review*, 80(3): 355-361.
- de Palma, A., Ben-Akiva, M., Brownstone, D., Holt, C., Magnac, T., McFadden, D., Moffatt, P., Picard, N., Train, K. E., Wakker, P. P., & Walker, J. 2008. Risk, Uncertainty and Discrete Choice Models. *Marketing Letter*, 19(3-4): 269-285.
- Emmett, R. B. 1999. The Economist and the Entrepreneur: Modernist Impulses in Risk, Uncertainty, and Profit. *History of Political Economy*, 31(1): 29-52.
- Fehr, E., & Gächter, S. 2000. Fairness and Retaliation : The Economics of Reciprocity. *The Journal of Economic Perspectives*, 14(3): 159-181.
- Fligstein, N. 2001. *The Architectures of Markets : An Economic Sociology of Twenty-First-Century Capitalist Societies*. Princeton: Princeton University Press.
- Foss, N. J., Lando, H., & Thomsen, S. 2000. The Theory of the firm. In B. Bouckaert, & G. De Geest (Eds.), *Encyclopedia of Law and Economics*, Vol. 1: Section 5610, pages 5631-5658. Cheltenham, U.K.: Edward Elgar.
- Frank, R. H. 2005. Positional Externalities Cause Large and Preventable Welfare Losses. *The American Economic Review*, 95(2): 137-141.
- Frank, R. H. 2008. Thaler, Richard H. and Sunstein, Cass R. Nudge: Improving Decision about Health, Wealth, and Happiness. *Ethics*.



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- Friedman, M. 1953. The Methodology of Positive Economics. In M. Friedman (Ed.), *Essays in Positive Economics*: 3-43. Chicago: University of Chicago Press.
 - Furubotn, E. G., & Richter, R. 2000. *Institutions and Economic Theory : The Contribution of the New Institutional Economics* (Paperback ed.). Ann Arbor: University of Michigan Press.
 - Granovetter, M. 1985. Economic Action and Social Structure: The Problem of Embeddedness. *The American Journal of Sociology*, 91(3): 481-510.
 - Granovetter, M. 1995. *Getting a Job : A Study of Contacts and Careers*. Chicago: Chicago University Press.
 - Grossman, S. J., & Hart, O. D. 1986. The Costs and Benefits of Ownership: A Theory of Vertical and Lateral Integration. *The Journal of Political Economy*, 94(4): 691-719.
 - Henderson, R., & Clark, K. 1990. Architectural Innovation: The Reconfiguration of Existing Product Technologies and the Failure of Established Firms. *Administrative Science Quarterly*, 35: 9-30.
 - Henrich, J. 2000. Does Culture Matter in Economic Behavior? Ultimatum Game Bargaining among the Machiguenga of the Peruvian Amazon. *The American Economic Review*, 90(4): 973-979.
 - Kahneman, D., & Tversky, A. 1979. Prospect Theory: An Analysis of Decision Under Risk. *Econometrica*, 47(2): 263-292.
 - Kahneman, D., & Thaler, R. H. 2006. Anomalies: Utility Maximization and Experienced Utility. *Journal of Economic Perspectives*, 20(1): 221-234.
 - Kitch, E. W. 1983. The Fire of Truth: A Remembrance of Law and Economics at Chicago. *Journal of Law and Economics*, 26(1): 163-234.
 - Klases, S. 2008. The Efficiency of Equity. *Review of Political Economy*, 20(2): 257-274.
 - Mandelbrot, B. B., & Hudson, R. L. 2004. *The Misbehavior of Markets: A Fractal View of Financial Turbulence*. New York: Basic Books.
 - Nelson, R. R., & Winter, S. G. 1982. *An Evolutionary Theory of Economic Change*. Cambridge, MA: The Belknap Press of Harvard University Press.
 - Nelson, R. R., & Winter, S. G. 2002. Evolutionary Theorizing in Economics. *The Journal of Economic Perspectives*, 16(2): 23-46.
 - Noam, E. M. 1994. Beyond Liberalization II: The Impending Doom of Common Carriage. *Telecommunications Policy*, 18: 435.
 - Noam, E. M. 1995. Taking the Next Step beyond Spectrum Auctions: Open Spectrum Access. *Communications Magazine, IEEE*, 33(12): 66-73.
 - Shiller, R. J. 2005. *Irrational Exuberance* (2 ed.). Princeton: Princeton University Press.
 - Taleb, N. N. 2007. *The Black Swan: The Impact of the Highly Improbable*. New York: Random House.
 - Thaler, R. H. 2000. From Homo Economicus to Homo Sapiens. *Journal of Economic Perspectives*, 14(1): 133-141.
 - Thaler, R. H., & Sunstein, C. R. 2008. *Nudge: Improving Decisions about Health, Wealth, and Happiness*. New Haven: Yale University Press.
 - White, H. C. 2002. *Markets from Networks: Socioeconomic Models of Production*. Princeton: Princeton University Press.
 - Zak, P. J., Borja, K., Matzner, W. T., & Kurzban, R. 2005. The Neuroeconomics of Distrust: Sex Differences in Behavior and Physiology. *The American Economic Review*, 95(2): 360-363