

Economic Growth and Development.

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This course consists of five three-hours lectures focusing on topics in the area of growth and development. The bibliography contains both articles that will be presented in detail and background material that will not be covered extensively. Starred article will receive particular attention.

The first lecture introduces the endogenous growth model with "expanding variety" due to Romer (1990) and discusses some applications (trade, integration and cycles)

- * Gancia G. and F. Zilibotti: "Horizontal Innovation in the Theory of Growth and Development" Forthcoming in the Handbook of Economic Growth (P. Aghion and S. Durlauf, eds.). Downloadable from my homepage.
- * Matsuyama, Kiminori "Growing Through Cycles," *Econometrica*, 67, 335-347 (1999).
- Matsuyama, Kiminori "Growing Through Cycles in an Infinitely Lived Agent Economy," *Journal of Economic Theory*, 100, 220-234 (2001).
- Rivera Batiz L. and Romer P.: "Economic Integration and Endogenous Growth" *Quarterly Journal of Economics*, 106, 531-555 (1999).
- * Romer, P. : "Endogenous Technical Change", *Journal of Political Economy* 98, S71-S102 (1990).
- Young Allwyn: "Substitution and Complementarity in Endogenous Innovation" *Quarterly Journal of Economics*, 108, 775-807 (1991).

The second lecture deals appropriate technologies in economic development. I will start from a brief account of the debate on the causes of large productivity differences across countries (TFP versus factor accumulation). Then, I will briefly discuss theories of barriers to technology adoption. Then, I will explore in some detail the hypothesis that these differences originate from an "inappropriate technological development". Namely, large productivity differences can persist even in the absence of significant institutional barriers to technology

adoption, due to the nature of technological development in the frontier. The model used is a multi-sectoral version of the expanding variety model discussed in the first lecture.

- * Acemoglu D. and Zilibotti F.: “Productivity Differences.” *Quarterly Journal of Economics*, 115, 563-606 (2001).
- Acemoglu D.: “Directed Technical Change”, *Review of Economic Studies*, vol. 69, no.4, (2002).
- Basu S. and Weil D.: “Appropriate Technology and Growth” *Quarterly Journal of Economics*, 113, 1025-1054 (1999).
- Gancia G.: “Globalization and Divergence”, Mimeo, MIT (2003).
- * Hall R. and Jones C.: “Why Do Some Countries Produce So Much More Output per Worker Than Others?” *Quarterly Journal of Economics*, 114, 83-116 (1999).
- * Hsieh C.: “What Explains the Industrial Revolution in East Asia?” *American Economic Review*, June 2002.
- Jones, Charles I. “Economic Growth and the Relative Price of Capital.” *Journal of Monetary Economics*, 34, 359-82. (1995)
- Klenow, P. and Rodriguez-Claire A.: “The Neoclassical revival in Growth Economics: Has It Gone Too Far?,” *NBER Macroeconomics Annual*, 73-103 (1997)
- Parente S. and Prescott E. “Barriers to Technology Adoption and Development,” *Journal of Political Economy* 102, 298-321 (1994)
- Parente, S., Rogerson, R. and Wright, R.: “Homework in Development”, *Journal of Political Economy* 108: 680-687 (2000).

The third lecture introduces Schumpeterian models of technological progress, where growth is driven by the introduction of new more productive machines (quality ladder). We first discuss the benchmark model of Aghion and Howitt (Ectca 1993). We then show how the model can explain low-frequency fluctuations due to the development of General Purpose Technologies (GPT), such as the IT revolution)

- * Aghion P. and Howitt P.: ”A Model of Growth through Creative Destruction.” *Econometrica* 60, 323-51 (1992).
- Aghion P. and Howitt P.: ”Endogenous Growth Theory” MIT Press, 1997. Chapter 2, 3, 8.4.

- * Aghion P. and Howitt P.: "On the Macroeconomic Effects of Major Technological Change" in Helpman, E. (ed.) *General Purpose Technologies and Economic Growth*, 121-145 MIT Press (1998).
- Bresnahan, T. and Trajtenberg, M.: "General Purpose Technologies: Engines of Growth?" *Journal of Econometrics*, 65, 83-108 (1995).
- Caselli F.: "Technological Revolutions", *American Economic Review* 89, (1999).
- Grossman G. and Helpman H.: "Comparative Advantage and Long-run Growth." *American Economic Review* 80, 796-815 (1990)
- Helpman E. (ed.): *General Purpose Technologies and Economic Growth*, Cambridge: MIT Press (1998).
- Helpman, E. and Trajtenberg, M.: "A Time to Sow and a Time to Reap: Growth Based on General Purpose Technologies", in Helpman, E. (ed.) *General Purpose Technologies and Economic Growth*, 55-85 MIT Press (1998).
- Young A.: "Growth without Scale Effects" *Journal of Political Economy*, 106, 41-63 (1998).

The fourth lecture is about technological convergence and the process of institutional change. I will first present a multi-sector version of a Schumpeterian model of technological progress à la Aghion and Howitt (1993). Then, I introduce a key assumption linking the importance of innate ability to the stage of the process of technological convergence to the frontier. Then, I discuss contractual relationships between firms and managers in such economy, and compare them to the second-best efficient benchmark. Politico-economic considerations are also analyzed. The theory provides predictions about the effect of liberalization. Some empirical analysis will also be discussed.

- * Acemoglu, Aghion P. and Zilibotti F.: "Distance to Frontier, Selection and Economic Growth." With P. Aghion and D. Acemoglu. Downloadable from my homepage.
- Acemoglu, Aghion P. and Zilibotti F.: "Vertical Integration and Distance to Frontier." With P. Aghion and D. Acemoglu. *Journal of the European Economic Association*, 1, (2003).
- Acemoglu Daron, Philippe Aghion, Rachel Griffith and Fabrizio Zilibotti "Vertical Integration and Technology: Theory and Evidence." (2004). Mimeo, downloadable from my homepage.

- Aghion Philippe, Robin Burgess, Steve Redding and Fabrizio Zilibotti "The Unequal Effects of Liberalization: Theory and Evidence from India." (2004).
- Aghion, Philippe, and Peter Howitt. (1992) "A Model of Growth Through Creative Destruction." *Econometrica*, vol. 60, pp. 323-51.
- Francois, Patrick and Joanne Roberts (2001), "Contracting Productivity Growth" CentER Working Paper No.35, Tilburg University. Forthcoming in the *Review of Economic Studies*.
- Galor, Oded and Daniel Tsiddon (1997), "Technology, Mobility, and Growth", *American Economic Review*, vol. 87, pp.363-382.
- Gerschenkron, Alexander (1962) *Economic Backwardness in Historical Perspective*, Harvard University Press, Cambridge MA.
- Rodrik, Dani and Arvind Subramanian (1994) "From "Hindu Growth" to Productivity Surge: The Mystery of the Indian Growth Transition" NBER Working Paper No. w10376.

The last lecture analyzes the relationship between financial development and growth. I will focus, in particular, on a model where the extent of market incompleteness changes with the state of capital accumulation, in a world where agents dislike risk. The theory is consistent with the evidence that (i) development is accompanied by capital deepening and (ii) growth is significantly more volatile at earlier stages of development. I will also discuss the effect of financial globalization on cross-country inequality.

- * Acemoglu, Daron and Fabrizio Zilibotti (1997) "Was Prometheus Unbound by Chance? Risk Diversification and Growth." *Journal of Political Economy*, vol.105, pp.709-51.
- Acemoglu, Daron and Fabrizio Zilibotti (1999) "Information Accumulation in Development" *Journal of Economic Growth*, vol. 4, pp. 5-38.
- Cetorelli N.: "Could Prometheus Be Bound Again? A Contribution to the Convergence Controversy," Working Paper-98-3 Federal Reserve of Chicago (1998).
- Greenwood, Jeremy, and Boyan Jovanovic,(1990), "Financial Development, Growth, and the Distribution of Income", *Journal of Political Economy*, vol. 98, No. 5, Part 1. pp. 1076-1107
- * Matsuyama, Kiminori (2004) "Financial Market Globalization, Symmetry-Breaking, and Endogenous Inequality of Nations," *Econometrica*, forthcoming. Downloadable from Matsuyama's homepage.

- Rajan, Raghuram G. and Luigi Zingales (1998) “Financial Dependence and Growth’, *American Economic Review*, vol. 88, pp. 559-586.