

GROWTH and DEVELOPMENT

GOALS

Perhaps the most challenging question in development economics is why some countries are so much poorer than the U.S. During the last twenty years the study of the forces that shape the rate of economic growth became one of the most active areas of research in economics. On the theoretical front, researchers produced a variety of models in which sustained growth can take place in the absence of exogenous growth in productivity. On the empirical front, there was an intense search for variables that correlate with growth performance in variants of the Summers and Heston data set. Three related but conceptually distinct issues lie at the heart of this research:

- World growth
- Country growth
- Dispersion in income levels

[Why did so many macroeconomists suddenly divert their efforts from the study of business cycles to the quest for a better understanding of the growth process?](#) Lucas (1987) provided a rationale for this reallocation of research effort. He confronted an agent with preferences that are standard in macro models with the question of how much consumption he would be willing to give up to eliminate the fluctuations in his consumption associated with business cycles. The answer was – very little, suggesting that the welfare cost of business fluctuations is very small. In contrast, this hypothetical agent would be willing to forgo a significant fraction of his consumption to live in an economy which expands at a faster rate.

Lucas' (1987) calculation has been criticized for being appropriate only in a world of complete markets. The costs of business cycles could potentially be higher if there are idiosyncratic shocks that the agents cannot insure against. Recent work suggests that Lucas's calculation is likely to hold up as well in incomplete markets. Lucas's welfare calculation suggested that there is much more to be gained from understanding the determinants of the growth process than from fine tuning our understanding of what drives economic fluctuations (Rebelo, 2001).

The primary goal of this course is to motivate and initiate innovative research in the field of economic growth and development. Hence, lectures are complemented by student presentations in class of research papers in the literature, and by the completion and presentation of an original research project. You will find that we focus heavily on issues, models, and quantitative work at the intersection of economic growth and development.

EVALUATION

Class Presentations

Each student will present papers. You will have 45 minutes for the presentation. Each presentation should direct the questions such as

What question is this paper trying to answer?

What sorts of tools does the author use to answer the question?

What is the answer that the author comes up with and does it make sense to you?

You should derive the key equations and analytical expressions of the paper. Moreover, you should clearly explain the computational experiments and sketch the details of the numerical algorithm. Each person's talk will be graded on its technical content, organization, clarity, thoroughness, and effectiveness. How well you handle questions from the other students will also be taken into account.

Tips on Preparing for the Presentations

Communication of results is an essential component of economic research. Many economists prefer attending conferences, workshops, and seminars to reading working papers and journal articles as a way of picking up ideas. The fundamental ingredient in a good presentation is preparation. Try to practice the presentation more than once. When you are preparing slides, make sure that the font is large enough to be readable. Since time is precious to you in your presentation, you should think carefully about how you want spend it.

Long introductions are almost always a bad idea. What the audience usually wants to learn during the introduction is the question that you intend to answer, why the question and the answer are important, and, probably, what your answer is going to be. In general, audiences do not like research presentations to be mysterious. Surprise endings are fine for novels and films, but usually not for economic research. You will learn a lot in preparing for your presentation. You can also learn a lot at the class from the other presentations.

The final draft of the written research project is due on the scheduled final examination date. The research paper cannot be the same as that submitted to another class, in this or any other semester.

Your final grade in the class will be determined as the following weighted average of your work throughout the semester

Class Presentations	40%
Written Research Project	30%
Final Exam	30%

REQUIRED REFERENCES

The required textbooks for the course are:

Acemoglu, Daron. *Introduction to modern economic growth.* Cambridge, Princeton University Press, 2009.

Stokey, Nancy L.; Lucas, Robert E., Jr. and Prescott, Edward C. *Recursive Methods in Economic Dynamics.* Cambridge, MA: Harvard University Press, 1989.

COURSE OUTLINE

What follows is a list of papers for this course. This list is much too long by design. The intention is to give you some sort of an organization of the literature along with a guide, by topic, of some of the recent work in the area in case you are interested in pursuing a particular topic in more detail. This list is not complete.

I Data and the Neoclassical Model of Development

Of course, all good science is a combination of inductive and deductive methods, a constant interchange between data and theory. It simply cannot be asserted that either one or the other comes “first” as a matter of principle.

1 Data Sources: An Introduction

Conference Board and Groningen Growth and Development Centre. *Total Economy Database*. November, 2007.

Heston, Alan; Summers, Robert and Aten, Bettina. Penn World Table Version 6.2. Center for International Comparisons of Production, Income and Prices at the University of Pennsylvania, September 2006.

Organization for Economic Cooperation and Development (OECD). *The OECD STAN database*. Paris: OECD, 2005.

World Bank Group, [WDI Online](#).

2 Background Reading

Becker, Gary S. “Human Capital and the Economy.” *Proceedings of the American Philosophical Society*, March 1992, 136(1), pp. 85-92.

Bernanke, Ben S., and Gurkaynak, Refet. “Is Growth Exogenous? Taking Mankiw, Romer and Weil Seriously.” In Ben S. Bernanke and Kenneth S. Rogoff eds., *NBER Macroeconomics Annual*, Cambridge, MA: MIT Press, 2001,

Caselli, Francesco. “Accounting for Cross-Country Income Differences.” In Philippe Aghion and Steven Durlauf eds., *Handbook of Economic Growth*, Elsevier Press, 2005, pp. 679-741.

Grabowski, Richard; Self, Sharmistha and Shields, Michael P. *Economic Development: A regional, institutional, and historical approach*. M. E. Sharpe Inc., 2007.

Hall, Robert E. and Jones, Charles I. “Why Do Some Countries Produce So Much More Output per Worker than Others?” *Quarterly Journal of Economics*, February 1999, 114(1), pp. 83-116.

Hulten, Charles R. and Isaksson, Anders. “Why Development Levels Differ: The Sources of Differential Economic Growth in a Panel of High and Low Income Countries.” *NBER Working Paper Series*, No: 13469, October 2007.

Kaldor, Nicholas. “Capital Accumulation and Economic Growth.” In F. P. Lutz and D. C. Hague, eds., *The theory of capital*. New York: St. Martin’s, 1961, pp. 177-222.

Kehoe, Timothy J. and Prescott, Edward C. “Great Depressions of the 20th Century.” *Review of Economic Dynamics*, January 2002, 5(1), pp.1-18.

Klenow, Peter J., and Rodríguez-Clare, Andrés. “Economic Growth: A Review Essay.” *Journal of Monetary Economics*, December 1997, 40(3), pp. 597-617.

Klenow, Peter J., and Rodríguez-Clare, Andrés. “The Neoclassical Revival in Growth Economics: Has It Gone Too Far?” In Ben S. Bernanke and Julio Rotemberg eds., *NBER Macroeconomics Annual*, Cambridge, MA: MIT Press, 1997, pp. 73-102.

3 Roots of Modern Economic Growth

The term “useful knowledge” was used by Simon Kuznets as the source of modern economic growth. The growth of technological and scientific knowledge in the past two centuries has been the overriding dynamic element in the economic and social history of the world. Its result is now often called the knowledge economy. Joel Mokyr argues that the growth explosion in the modern West in the past two centuries was driven not just by the appearance of new technological ideas but also by the improved access to these ideas in society at large--as made possible by social networks comprising universities, publishers, professional sciences, and kindred institutions.

Kuznets, Simon. “Modern Economic Growth: Findings and Reflections.” *American Economic Review*, June 1973, 63(3), pp. 247-58.

Maddison, Angus. *Phases of capitalist development*. Paris: OECD Development Center, 2001.

Mokyr, Joel. *The gifts of Athena: Historical origins of the knowledge economy*. Princeton University Press, 2002.

Mokyr, Joel. “Long-Term Economic Growth and the History of Technology.” In Philippe Aghion and Steven N. Durlauf eds., *Handbook of Economic Growth*, Elsevier Science: North Holland, 2005, Volume 1B, pp.1113-1180.

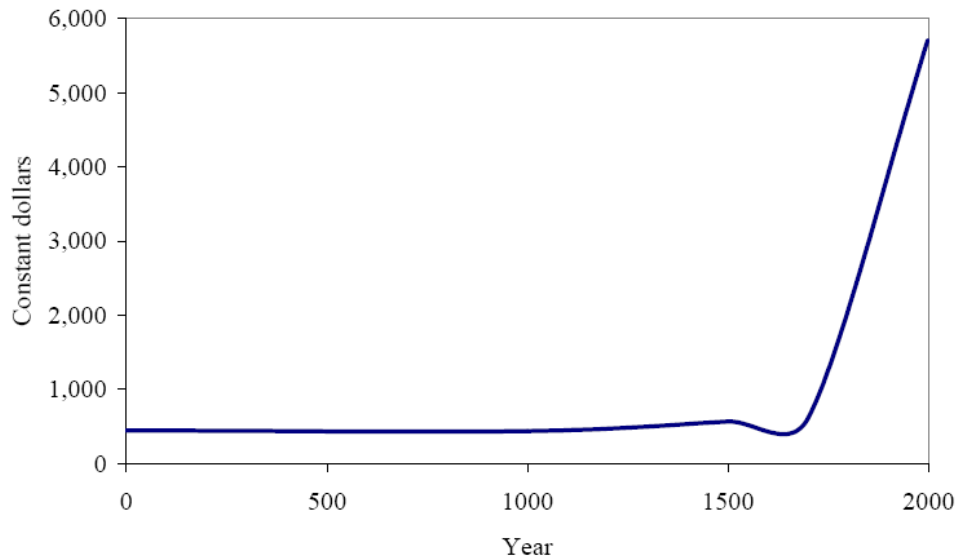
Parente, Stephen and Prescott, Edward C. *Barriers to riches*. Cambridge, MA: MIT Press, 2000.

II Transition from Stagnation to Growth

Until about 200 years ago, living standards were essentially stagnant in every country in the world. Starting with the industrial revolution in Britain, an increasing number of countries have undergone a transformation from a pre-industrial, stagnant, mostly agricultural economy to a modern society where sustained economic growth is the norm. The transition from stagnation to growth is not simply a matter of increased technical progress or faster capital accumulation, but a sweeping transformation of a diverse set of aspects of the economy and of society.

For example, all countries that have successfully developed have also experienced a demographic transition of rapidly falling mortality and fertility rates, a structural transformation from agriculture to industry and services, as well as political changes such as the abolishment of child labor, the introduction of public education, and the expansion of women's rights.

World GDP per Capita (Maddison, 2001)



Galor, Oded. “From Stagnation to Growth: Unified Growth Theory.” In Philippe Aghion and Steven N. Durlauf eds., *Handbook of Economic Growth*, Elsevier Science: North Holland, 2005, Volume 1A, pp.171-293.

Greenwood, Jeremy and Seshadri, Ananth. “Technological Progress and Economic Transformation.” In Philippe Aghion and Steven N. Durlauf eds., *Handbook of Economic Growth*, Elsevier Science: North Holland, 2005, Volume 1B, pp.1225-73.

Lucas, Robert E., Jr. *Lectures on economic growth*. Cambridge, MA: Harvard University Press, 2002.

Parente, Stephen and Prescott, Edward C. “A Unified Theory of the Evolution of International Income Levels.” In Philippe Aghion and Steven N. Durlauf eds., *Handbook of Economic Growth*, Elsevier Science: North Holland, 2005, Volume 1B, pp.1371-1416.

1 Structural Transformation and Economic Development

The figure below provides a summary of some of the major changes in the structure of production that the US economy has undergone over the past 150 years. It shows that the share of US employment in agriculture stood at around 90 percent of the labor force at the beginning of the 19th century, while only a very small fraction of the US labor force worked in manufacturing and services. By the second half of the 19th century, both manufacturing and services had expanded to over 20 percent of employment, accompanied by a steep decline in the share of agriculture.

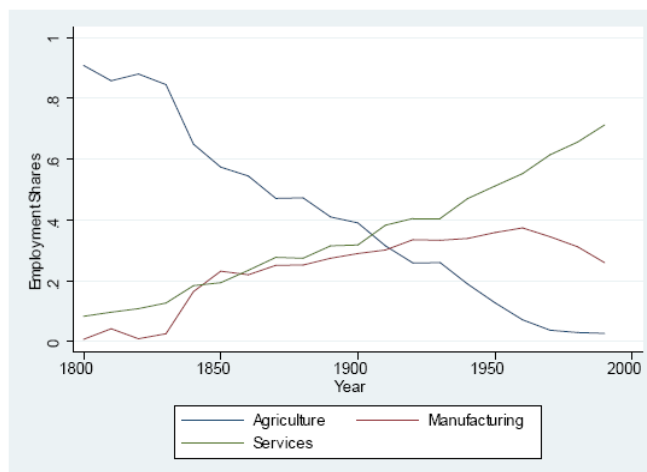


Figure: The share of US employment in agriculture, manufacturing and services, 1800-2000.

Acemoglu, Daron and Guerrieri, Veronica. “Capital Deepening and Non-Balanced Economic Growth.” *Journal of Political Economy*, June 2008, 116(3), pp. 467-498.

Buera, Francisco J. and Kaboski, Joseph P. “[The Rise of the Service Economy.](#)” Working Paper, Northwestern University and Ohio State University, August 2007

Buera, Francisco J. and Kaboski, Joseph P. “[Scale and the Origins of Structural Change.](#)” Working Paper, Northwestern University and Ohio State University, February 2008

Caselli, Francesco and Coleman, John Wilbur, II. “The U.S. Structural Transformation and Regional Convergence: A Reinterpretation.” *Journal of Political Economy*, June 2001, 109(3), pp. 584-616.

Echevarria, Cristina. “Changes in Sectoral Composition Associated with Economic Growth.” *International Economic Review*, May 1997, 38(2), pp. 431-52.

Gollin, Douglas; Parente, Stephen L. and Rogerson, Richard. “Farm Work, Home Work and International Productivity Differences.” *Review of Economic Dynamics*, October 2004, 7(4), pp. 827-50.

Gollin, Douglas; Parente, Stephen L. and Rogerson, Richard. “The Food Problem and the Evolution of International Income Levels.” *Journal of Monetary Economics*, May 2007, 54(4), pp. 1230-55.

Hsieh, Chang-Tai and Klenow, Peter J. “Misallocation and Manufacturing TFP in China and India.” Forthcoming, *Quarterly Journal of Economics*.

Kongsamut, Piyabha; Rebelo, Sergio and Xie, Danyang. “Beyond Balanced Growth.” *Review of Economic Studies*, October 2001, 68(4), pp. 869-882.

Matsuyama, Kiminori. “Agricultural Productivity, Comparative Advantage, and Economic Growth.” *Journal of Economic Theory*, December 1992, 58(2), pp. 317-34.

Matsuyama, Kiminori. “Structural Change.” In Lawrence Blume and Steven N. Durlauf eds., *The New Palgrave Dictionary of Economics*, May 2005, forthcoming.

Matsuyama, Kiminori. “Structural Change in an Interdependent World: A Global View of Manufacturing Decline.” *Journal of the European Economic Association*, 2009, 7(2-3), pp. 478-86.

Ngai, Rachel L. and Pissarides, Christopher A. “Structural Change in a Multisector Model of Growth.” *American Economic Review*, March, 2007, 97(1), pp. 429-43.

2 Demographic Transition

The standard explanation for economic stagnation in the pre-industrial era is the Malthusian income-population feedback. Before industrialization, living standards and population growth were positively related: when food and other resources were plentiful, people had more children, and more children survived to adulthood. This relationship led to a Malthusian trap where productivity improvements increased population density, which, in turn, depressed living standards due to the scarcity of land.

Given the central role of population growth in Malthus' theory, it is no surprise that the first models of the transition from stagnation to growth (such as Galor and Weil 2000 and Hansen and Prescott 2002) focused on the demographic dimension of the transition. In my work on the issue, I concentrate on the question why the speed and timing of fertility decline varies so substantially across countries. For example, after World War II a number of Asian countries such as South Korea needed only thirty years to undergo a demographic shift that in Britain took more than 100 year to complete.

Doepke (2004) develops a theory in which (following Hansen and Prescott 2002) the economic takeoff is modeled as an endogenous switch from a land-intensive agricultural technology to a modern industrial technology. Fertility decisions are endogenous, and are subject to a quantity-quality tradeoff. The model generates a transition from Malthusian stagnation to growth accompanied by a demographic transition from high to low fertility.

Barro, Robert J. and Becker, Gary S. “Fertility Choice in a Model of Economic Growth.” *Econometrica*, March 1989, 57(2), pp. 481-501.

Becker, Gary S.; Glaeser, Edward L. and Murphy, Kevin M. “Population and Economic Growth.” *American Economic Review*, May 1999, 89(2), pp. 145-149.

Becker, Gary S.; Murphy, Kevin M. and Tamura, Robert. “Human Capital, Fertility, and Economic Growth.” *Journal of Political Economy*, October 1990, 98(5), pp. 12-37.

Becker, Gary S. and Barro, Robert J. “A Reformulation of the Economic Theory of Fertility.” *Quarterly Journal of Economics*, February 1988, 103(1), pp. 1-25.

Doepke, Matthias. “Accounting for Fertility Decline during the Transition to Growth.” *Journal of Economic Growth*, September 2004, 9 (3), pp. 347-83.

Galor, Oded and Weil, David N. “Population, Technology, and Growth: From Malthusian Stagnation to the Demographic Transition and Beyond.” *American Economic Review*, September 2000, 90(4), pp. 806-828.

Hansen, Gary D. and Prescott, Edward C. “Malthus to Solow.” *American Economic Review*, September 2002, 92(4), pp. 1205-17.

Kremer, Michael. “Population Growth and Technological Change: One Million B.C. to 1990.” *Quarterly Journal of Economics*, August 1993, 108(3), pp. 681-716.

Tamura, Robert. “From Decay to Growth: A Demographic Transition to Economic Growth.” *Journal of Economic Dynamics and Control*, June-July 1996, 20(6-7), pp. 1237-61.

3 Institutions and Development

The world we live in was shaped by the rapid economic growth that took place in nineteenth-century Western Europe. The origins of this growth and the associated Industrial Revolution are generally considered to lie in the economic, political, and social development of Western Europe over the preceding centuries.

Acemoglu, Daron; Johnson, Simon and Robinson, James. “The Colonial Origins of Comparative Development: An Empirical Investigation.” *American Economic Review*, December 2001, 91(5), pp. 1369-1401.

Acemoglu, Daron; Johnson, Simon and Robinson, James. “The Rise of Europe: Atlantic Trade, Institutional Change, and Economic Growth.” *American Economic Review*, June 2005, 95(3), pp. 546-579.

Acemoglu, Daron; Johnson, Simon and Robinson, James. “Institutions as a Fundamental Cause of Long-Run Growth.” In Philippe Aghion and Steven N. Durlauf eds., *Handbook of Economic Growth*, Elsevier Science: North Holland, 2005, Volume 1A, pp. 385-472.

Acemoglu, Daron and Robinson, James A. “Economic Backwardness in Political Perspective.” *American Political Science Review*, February 2006, 100(1), pp. 115-31.

Barro, Robert J. “Institutions and Growth, an Introductory Essay” *Journal of Economic Growth*, June 1996, 1 (2), pp. 145-148.

Glaeser, Edward L.; La Porta, Rafael; Lopez-de-Silanes, Florencio and Shleifer, Andrei. “Do Institutions Cause Growth?” *Journal of Economic Growth*, September 2004, 9 (3), pp. 271-303.

Nunn, Nathan. “[The Importance of History for Economic Development](#).” *Annual Review of Economics*, 2009, 1, pp. 65-92.

4 General Purpose Technologies and Economic Growth

Traditionally, economists have considered the accumulation of conventional inputs such as labor and capital to be the primary force behind economic growth. Now, however, many macroeconomists place technological progress at the center of the growth process. This shift is due to new theoretical developments that allow researchers to link microeconomic aspects of the innovation process with macroeconomic outcomes. Most economists have viewed technological progress as an incremental process. A few have focused on the role of drastic innovations--those that introduce a discontinuity.

In this section we are concerned with the type of drastic innovation called general purpose technologies (GPTs). A GPT has the potential to affect the entire economic system and can lead to far-reaching changes in such social factors as working hours and constraints on family life. Examples of GPTs are the steam engine, electricity, and the computer. The study of GPTs is relatively new. A universal theoretical framework for dealing with GPTs does not yet exist.

Jovanovic, Boyan and Rousseau, Peter L. "General Purpose Technologies." In Philippe Aghion and Steven N. Durlauf eds., *Handbook of Economic Growth*, Elsevier Science: North Holland, 2005, Volume 1B, pp.1181-1226.

Helpman, Elhanan (Eds.). *General Purpose Technologies and Economic Growth*. Cambridge, MA: MIT Press, 1998.

III Openness and Growth

In these times of globalization and trade liberalization, a crucial issue is to know whether trade openness indeed promotes growth. There is a huge policy debate about what constitute "good" and "bad" policies for these countries that seem to have missed the train of economic development. Should they completely open up to international trade? As rhythmic as the tide, every politician rekindles the debate over trade policy. Is there a correlation between trade policy and economic performance? Do protectionist policies ensure growth or is it free trade that promotes rapid growth?

Lucas, Robert E., Jr. "Trade and the Diffusion of the Industrial Revolution." *American Economic Journal: Macroeconomics*, January 2009, 1(1), pp. 1-25.

McGrattan, Ellen R. and Prescott, Edward C. "Openness, Technology Capital, and Development." Forthcoming, *Journal of Economic Theory*.

Pack, Howard. "Industrialization and Trade." In Hollis B. Chenery and T.N. Srinivasan eds., *Handbook of Development Economics*. Amsterdam; New York and Oxford: Elsevier Science, North Holland, 1988, Volume 1, pp. 333-380.

Rebelo, Sergio. "Growth in Open Economies." *Carnegie-Rochester Conference Series on Public Policy*, July 1992, 36, pp. 5-46.

Ventura, Jaume. "Growth and Interdependence." *Quarterly Journal of Economics*, February 1997, 112(1), pp. 57-84.

Ventura, Jaume. “A Global View of Economic Growth.” In Philippe Aghion and Steven N. Durlauf eds., *Handbook of Economic Growth*, Elsevier Science: North Holland, 2005, Volume 1B, pp.1419-1497.

IV U.S. and European Employment and Productivity Growth

One of the most remarkable facts about Europeans is that they work much less than Americans. Europeans worked more than Americans in the 1950s and 1960s, when they were lowering their heads in the war reconstruction efforts, first, and then during a period of boom. But then Europeans began to work fewer and fewer hours per capita. While in the early 1970s hours worked per person were about the same in Europe and in the United States, today the French, German, and Italians work about 1400 hours per person per year versus about 1800 hours per person in the United States. These differences are almost an order-of-magnitude larger than those associated with business cycle fluctuations in the U.S. economy. The existence of such large differences provides an excellent opportunity for us to learn about what factors have the most effect on hours of work. Moreover, understanding the factors that account for these large differences in economic outcomes is likely to have important policy implications.

Krueger, Dirk and Kumar, Krishna B. “US-Europe Differences in Technology-Driven Growth: Quantifying the Role of Education.” *Journal of Monetary Economics*, January 2004, 51(1), pp. 161-190.

Ljungqvist, Lars and Sargent, Thomas “Understanding European Unemployment with Matching and Search-Island Models.” *Journal of Monetary Economics*, November 2007, 54(8), pp. 2139-79.

Ljungqvist, Lars and Sargent, Thomas “Understanding European Unemployment with a Representative Family Model.” *Journal of Monetary Economics*, November 2007, 54(8), pp. 2180-2204.

Ohanian, Lee; Raffo, Andrea and Rogerson, Richard. “[Long-Term Changes in Labor Supply and Taxes: Evidence from OECD Countries, 1956-2004.](#)” *The Federal Reserve Bank of Kansas City Research Working Paper Series*, 06-16, December 2006.

Ohanian, Lee; Raffo, Andrea and Rogerson, Richard. “[Work and Taxes: Allocation of Time in OECD Countries.](#)” *The Federal Reserve Bank of Kansas City Economic Review Articles*, Third Quarter 2007.

Rogerson, Richard. “Structural Transformation and the Deterioration of European Labor Market Outcomes.” *Journal of Political Economy*, April 2008, 116(2), pp. 235-59.

Rogerson, Richard. “Two Views on the Deterioration of European Labor Market Outcomes.” *Journal of the European Economic Association*, April-May 2004, 2(2-3), pp. 447-55.

Shimer, Robert. “Convergence in Macroeconomics: The Labor Wedge.” *American Economic Journal: Macroeconomics*, January 2009, 1(1), pp. 280-97.