

Lecture Note

Growth

Growth Slides

Solow Model

Schumpeterian
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Lecture Two Slides

Econ 560

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The Pennsylvania State University

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Introduction

Time Scale of Modern Economic Growth

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- Conservative estimates suggest that humans were already distinguishable from other primates 1 million years ago. Imagine placing a time line corresponding to this million year period along the length of a football field. On this time line, humans were hunters and gatherers until the agricultural revolution, perhaps 10,000 years ago that is, for the first 99 yards of the field. The height of the Roman empire occurs only 7 inches from the right most goal line, and the Industrial Revolution begins less than one inch from the field's end. Large, sustained increases in standards of living have occurred during a relatively short time equivalent to the width of a golf ball resting at the end of a football field.

Distribution of Countries

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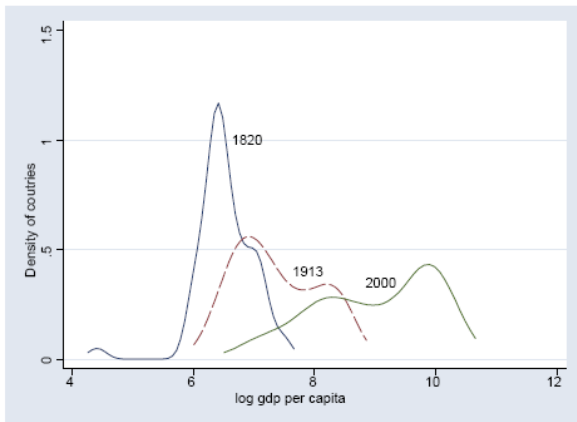


Figure: Estimates of the distribution of countries according to log GDP per capita in 1820, 1913 and 2000.

Convergence?

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Figure: Annual growth rate of GDP per worker between 1960 and 2000 versus log GDP per worker in 1960 for core OECD countries.

Multiple Equilibria

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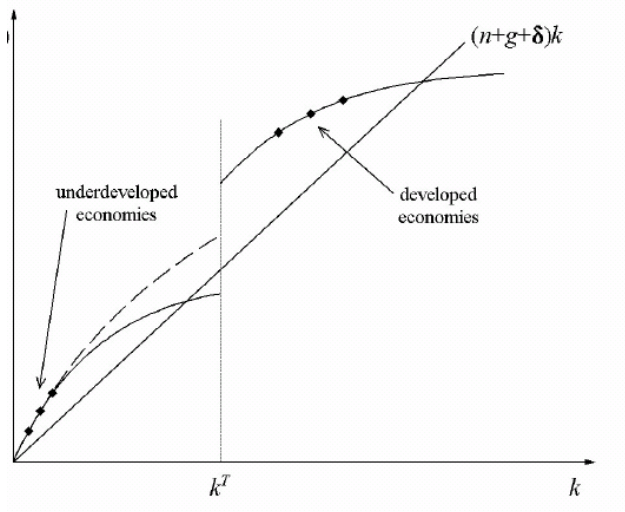
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Growth by Groups

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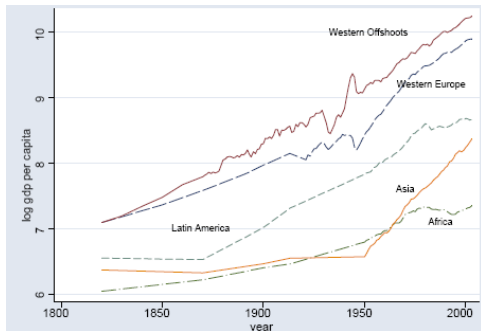


Figure: Evolution of GDP per-capita by groups

The Long View

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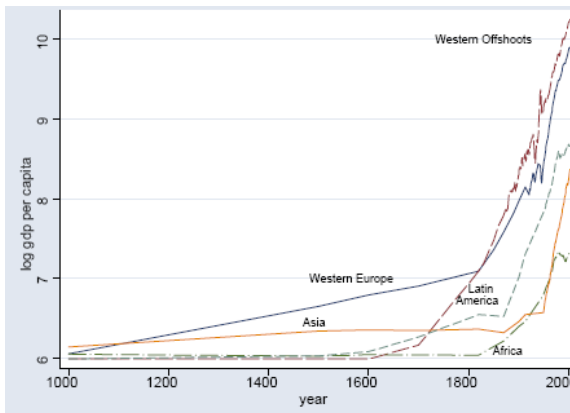


Figure: The evolution of average GDP per capita in Western Offshoots, Western Europe, Latin America, Asia and Africa, 1000-2000.

Evolution of per-capita GDP

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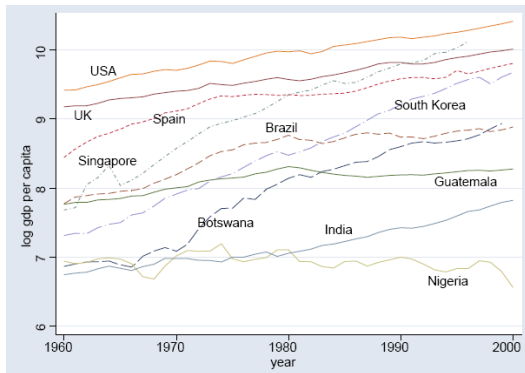


Figure: Evolution of Per-Capita GDP, selected economies

Capital and Labor Shares

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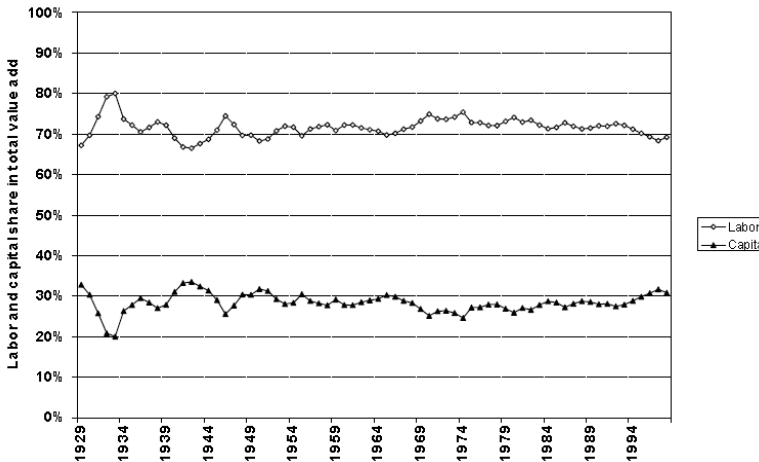
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Dynamic Adjustment

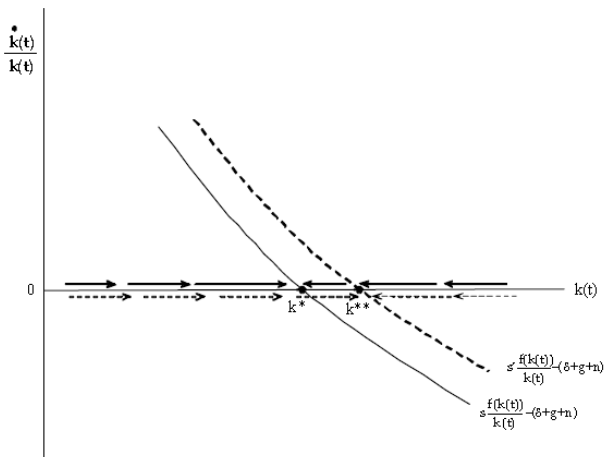


Figure: Dynamics following rise in savings rate

Estimates of the Basic Solow Model

Table 1: Estimates of the Basic Solow Model

	MRW 1985	Updated 1985	Updated 2000
$\ln s_k$	1.42 (.14)	1.01 (.11)	1.22 (.13)
$\ln(n + g + \delta)$	-1.97 (.56)	-1.22 (.55)	-1.81 (.36)
Adj R^2	.59	.49	.49
Implied α	.59	.50	.55
# Observations	98	98	107

Estimates of the Augmented Solow Model

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	MRW 1985	Updated 1985	Updated 2000
$\ln s_k$.69 (.13)	.65 (.11)	.96 (.13)
$\ln(n + g + \delta)$	-1.73 (.41)	-1.02 (.45)	-1.06 (.33)
$\ln s_k$.66 (.07)	.47 (.07)	.70 (.13)
Adj R^2	.78	.65	.60
Implied α	.30	.31	.36
Implied β	.28	.22	.26
# Observations	98	98	107

1996 Price of Machinery and Equipment

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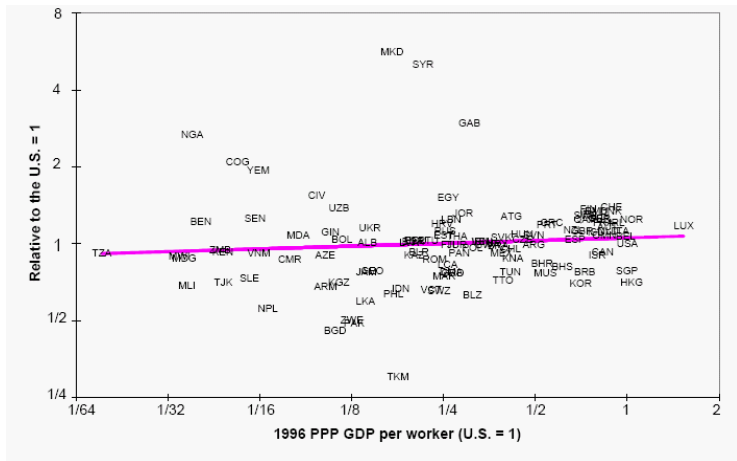
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Schumpeter

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Creative Destruction

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- The fundamental impulse that sets and keeps the capitalist engine in motion comes from the new consumers' goods, the new methods of production or transportation, the new markets, [This process] incessantly revolutionizes the economic structure from within, incessantly destroying the old one, incessantly creating a new one. This process of Creative Destruction is the essential fact about capitalism. Joseph Alois Schumpeter (1942): *Capitalism, Socialism and Democracy*. New York: Harper and Brothers. p. 83

Schumpeter on Competition

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- Economists are at long last emerging from the stage in which price competition was all they saw. . . . In capitalist reality. . . it is not that kind of competition which counts but the competition from the new commodity, the new technology, the new source of supply, the new type of organization. . . competition which. . . strikes. . . existing firms. . . at their foundations and their very lives. This kind of competition is. . . much more effective than the other. . . and [is]. . . the powerful lever that in the long run expands output. CSD, 84 –85.

Basic Model

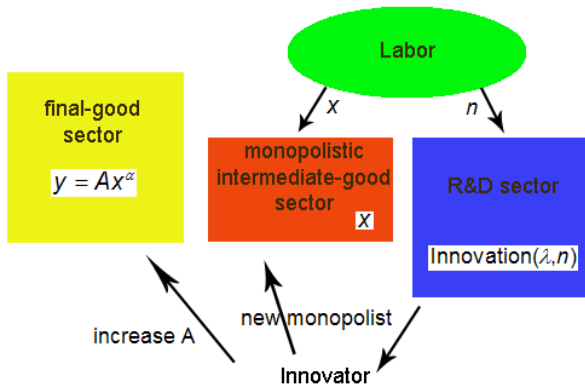


Figure: Basic Setup of the Model

Steady State Equilibrium

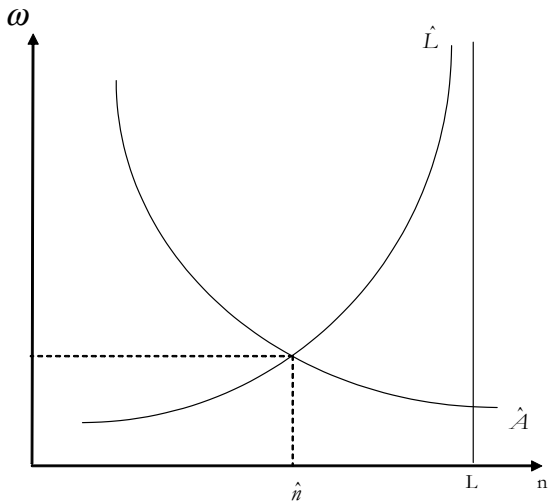


Figure: Steady-State Equilibrium

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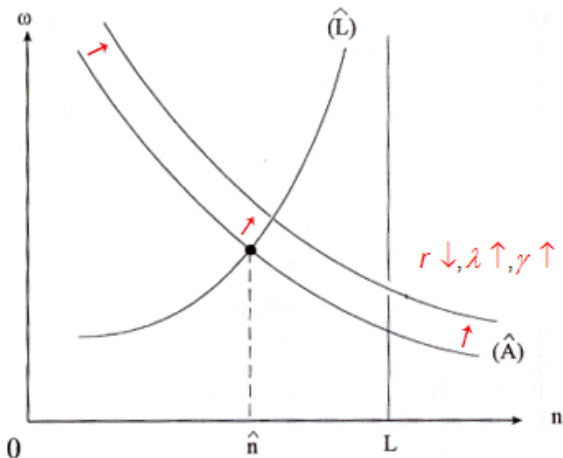
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Comparative Statics

- Fall in r , increase in λ , increase in $\gamma \implies A$ shifts up



Output Growth

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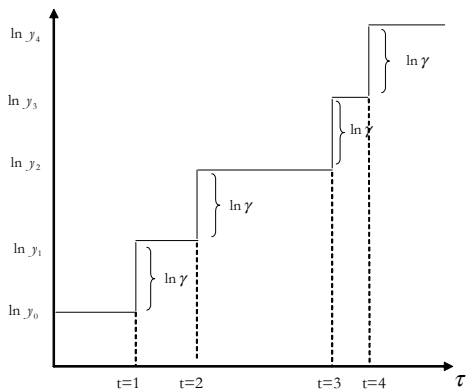


Figure: Output Growth

Gerschenkron on Backwardness

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- "... in a number of important historical instances industrialization processes, when launched at length in a backward country, showed considerable differences with more advanced countries, not only with regard to the speed of development (the rate of industrial growth) but also with regards to the productive and organizational structures of industry... these differences in the speed and character of industrial development were to a considerable extent the result of application of institutional instruments for which there was little or no counterpart in an established industrial country." Gerschenkron (1962, p. 7)

GDP relative to US

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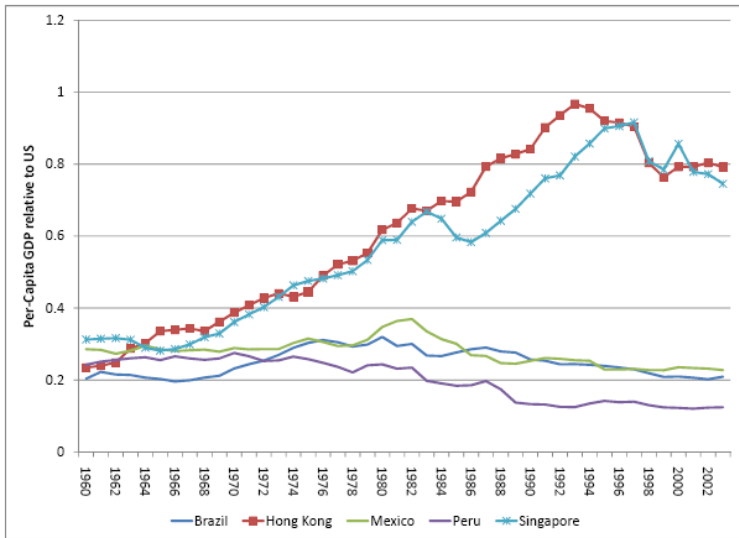
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Growth Trap

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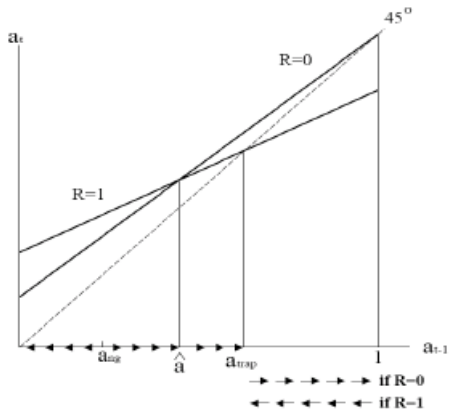


Figure 1: Growth Traps

Political Economy Trap

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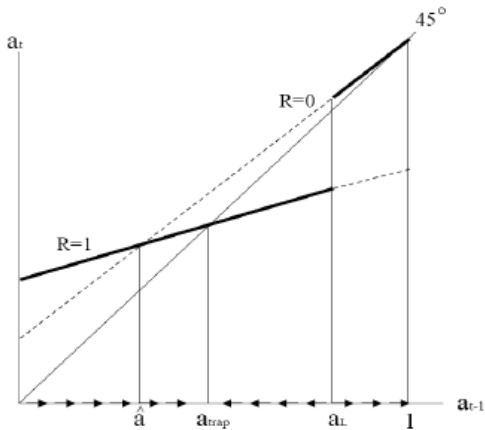


Figure 2: A Political Economy Trap

Theory of Institutions

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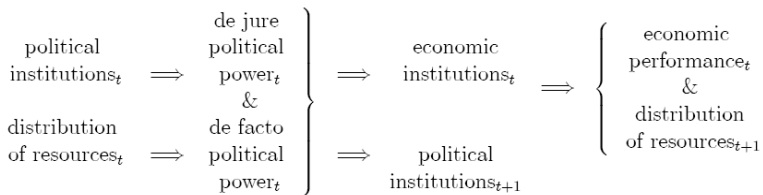
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TFP Decline in China

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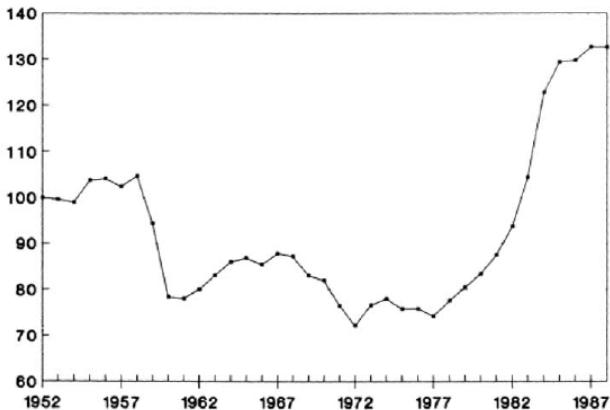


FIG. 1.—Total factor productivity index, 1952–88 (index: 1952 = 100)

Trigger Strategy

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