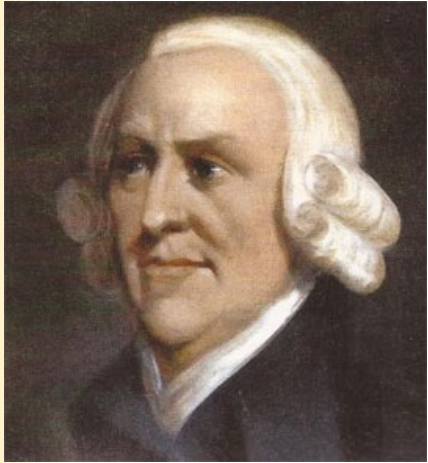

Economic Development of Southeast Asia

GROWTH THEORY

Adam Smith, *The Wealth of Nations* (1776)



Adam Smith

- *Specialization* and the *division of labor* are the sources of economic growth
- Smith anticipated modern manufacturing
 - Skills develop from performing a repeated task: learning by doing
 - The assembly line: no time lost switching between tasks
 - Dividing production into tasks that can be mechanized (capital equipment)
- But specialization and the division of labor depend on the size of the market → Smith never assumed that everything produced will automatically find a market

Specialization and the division of labor depend on the size of the market



Hla Myint

- Hla Myint brought Smith's concept of "vent for surplus" to Southeast Asian development
- Southeast Asia exported plantation crops (rubber, coffee, rice) to bring underutilized resources (in this case land) into production
- Myint was an early proponent of export-led growth (opposed to the export pessimism of Gunnar Myrdal)
- Export markets are large creating opportunities to realize economies of scale
- Profitability drives capital investment, which increases productivity and profits

An introduction to growth theory

- Classical economists like Adam Smith and Hla Myint emphasized capital investment, the division of labor and trade as the sources of economic growth
- Neoclassical growth models made some restrictive assumptions that changed the growth agenda for a generation, especially diminishing returns to capital
- The theory predicts that poor countries will grow faster than rich ones (convergence) because of diminishing returns to capital and lower capital output ratios
- “New” growth theory from the 1980s relaxed some of these assumptions to explain the absence of “convergence and to bring capital and technology back into the picture

Neoclassical growth theory: The Solow Model

- Neoclassical economics assumes that prices adjust to ensure that supply always equals demand
- Therefore
 - Savings always equals investment ($S = I$)
 - The level of investment is given by saving (lower consumption and smaller government deficits raise the level of investment)
 - Expected profits disappear as a factor in the level of investment
- There are three more assumptions to keep the math simple:
 - Technology changes over time, but this is outside of the model as is assumed to grow at a constant rate
 - There are *constant returns to scale* and *diminishing returns to capital and labor*
 - The labor force grows at the same rate as the population

The Cobb-Douglas production function: Commonly used model to calculate total factor productivity growth

$$Y = TK^{\alpha}L^{1-\alpha}$$

where Y is income (GDP), T is constant technological progress, K is capital and L is labor (growing at a constant rate).

α is the elasticity of output with respect to capital, and $(1 - \alpha)$ is the elasticity of output with respect to labor

Because $\alpha + (1 - \alpha) = 1$, we know the system has constant returns to scale and diminishing returns to capital and labor.

Increasing K and L by 1% results in a 1% increase in Y

Divide both sides by L to make labor productivity the dependent variable

$$\frac{Y}{L} = \frac{TK^\alpha L^{1-\alpha}}{L} = T\left(\frac{K}{L}\right)^\alpha$$

Y/L is labor productivity (output per person). Let's call that q

K/L is the capital-labor ratio (the amount of capital per worker). Let's call that k .

$q = T(k)^\alpha$ or labor productivity is equal to technology applied to the capital-labor ratio, growing at a constant rate but less than one.

The *level* of labor productivity (q) depends on the amount of capital per worker (k)

But there are *diminishing returns to capital* so the *rate of growth of q* is slower when the capital-labor ratio is higher (α is less than 1).

The steady state: where the growth rate of l is equal to the growth rate of k

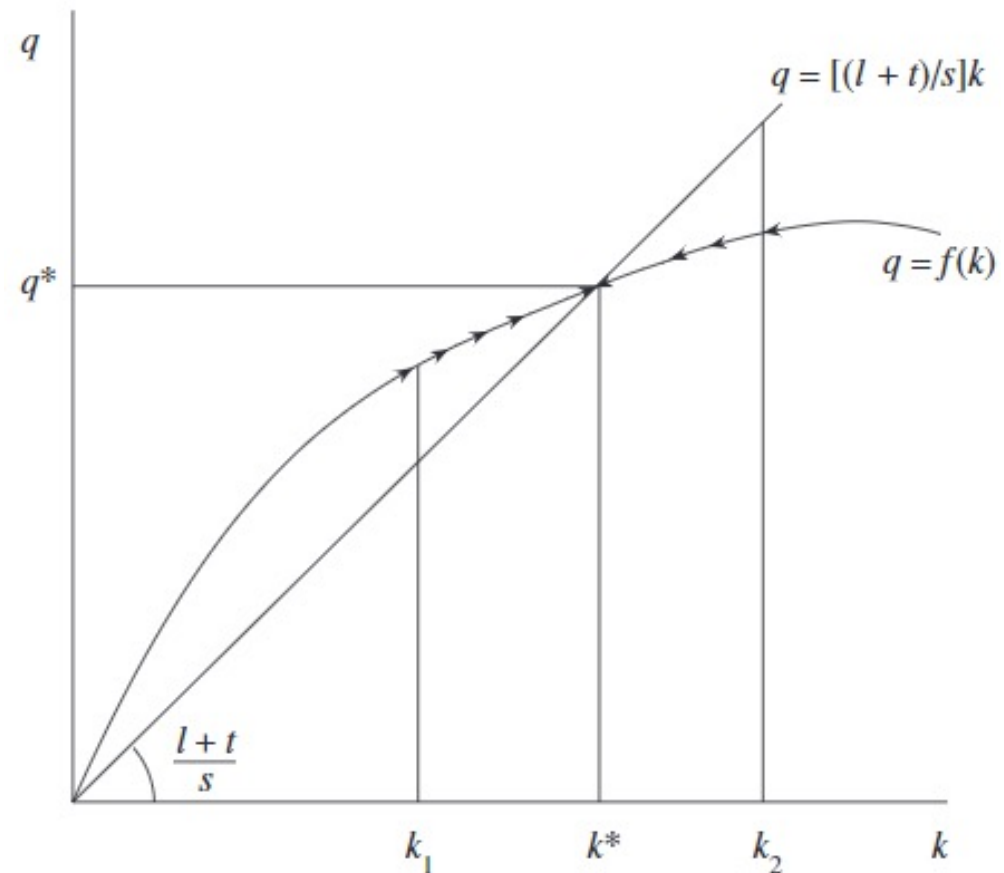
$q = T(k)^\alpha$ shows growth faster when k (capital per worker) is lower

The 45° line from the origin shows the amount of new capital per worker needed to keep k constant.

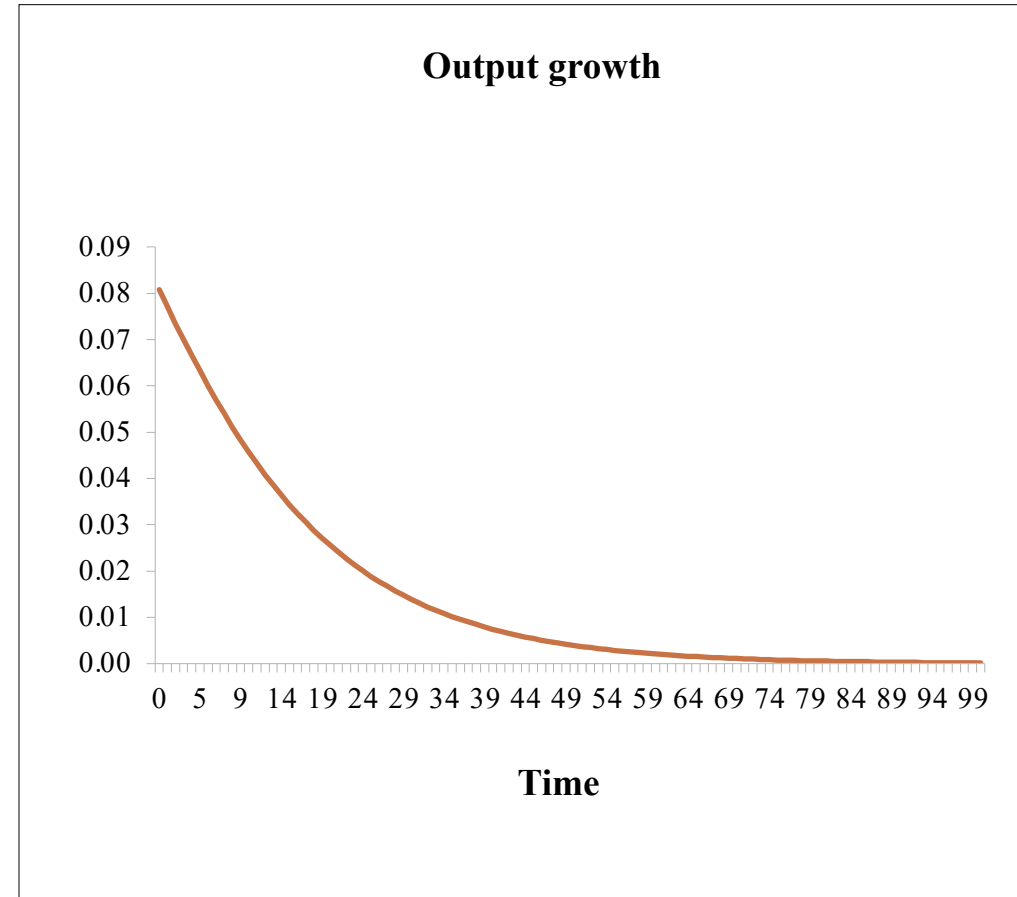
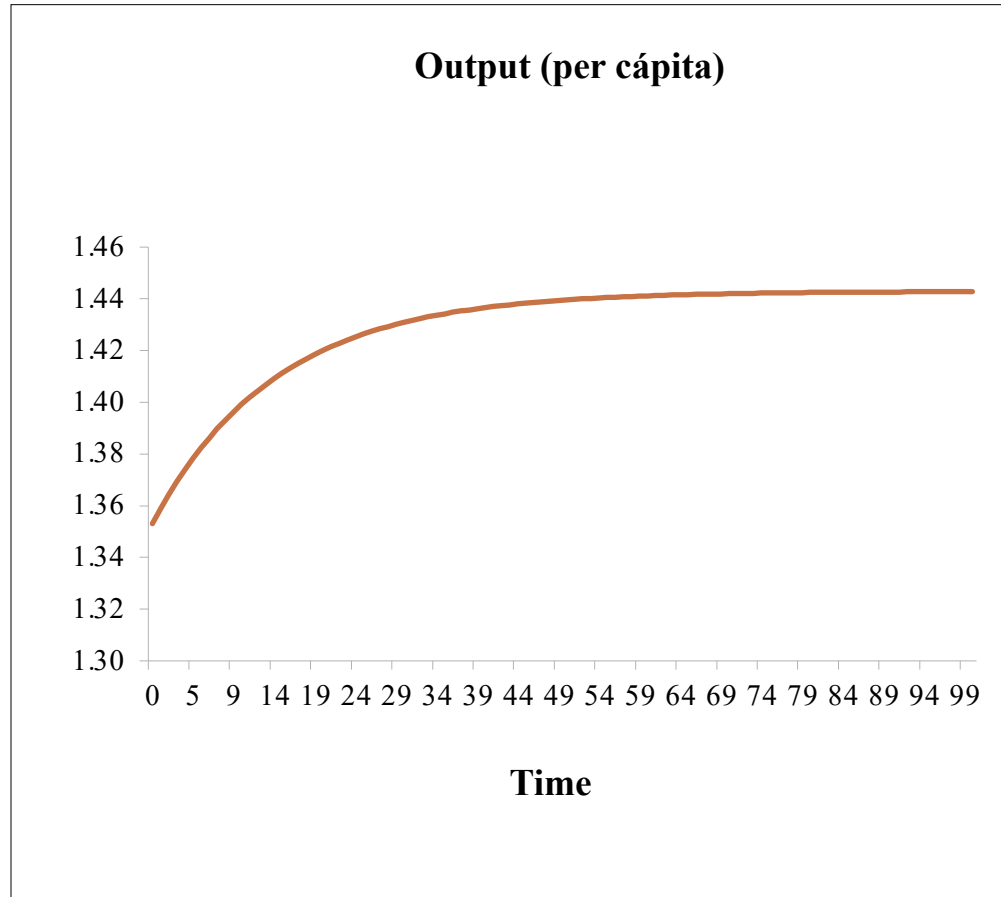
At k_1 capital per worker is growing faster than needed to keep k constant

At k_2 capital per worker is growing slower than needed to keep k constant

At q^* and k^* the capital/labor ratio is at the steady state. Capital per workers and income are constant.



You can have a look at a numerical example in the file
“Solow model example.xlsx”



What does it all mean?

- The main conclusion of the model is that economic growth is faster in poor countries (lower k) and slower in rich countries (higher k).
- So we should see *convergence* in incomes over time (we will discuss this in the next class).
- The savings rate affects the *level* of income at the steady state (higher k at the steady state), but not the *rate* of economic growth, which is external to the model (technological change and the rate of population growth)
- Investment always equals savings and there is no unemployment → a supply side model with no role for demand
- A higher investment rate can't raise the rate of growth: growth is largely explained by technology, which is not explained.

New neoclassical growth theory: “Endogenous” growth

- Drops the assumption of constant returns to scale and diminishing returns to capital.
- Then the investment rate matters because diminishing returns will not set in at higher K/L ratios
 - For example if there are positive externalities from research and development activity, then returns to capital will not fall (Romer).
 - Technical progress is no longer external to the model (it is endogenous)
 - Or education, or trade, or infrastructure or any other reason that prevents the returns to capital from falling as k rises
- A simple form of “endogenous” growth model;

$$Y = AK$$

Where A is the productivity of investment and is constant, so as investment grows growth grows at the same rate

“New” growth theory: Old wine in new bottles?

- Remember Adam Smith, the division of labor, increasing returns to scale and the accumulation of capital: Endogenous growth theory
- Nicholas Kaldor (1957): Technological progress is not separate from K , it is embedded in it.
 - When diminishing returns to capital set in, new inventions come along and increase the productivity and capital
 - New inventions simulate investment, raising investment rate and growth rate
 - Countries grow at different rates because they are on different production functions, using different technologies

What is missing from these stories about growth?

- Government: Throughout history, governments have played an important role in accelerating and holding back growth.
 - The US developed as a manufacturing power due to Alexander Hamilton's tariffs on manufactured imports
 - Japan, Korea, Taiwan and China have all benefited from government support for domestic industries.
- Demand: Neoclassical growth theory assumes supply always equals demand (there is no unemployment and savings always equals investment).
 - But development starts from a condition of surplus labor and low productivity, which cannot be assumed away
 - Investment will not occur, no matter what the level of savings, if there is insufficient demand for output

Policy implications

- Neoclassical growth theory had limited policy implications: technology was exogenous (external) to the model and the rate of investment did not affect the rate of growth
- New growth theory returns to the lessons of the past: capital investment, technological change and trade
- But policy implications are still limited: It leaves out the demand side and the role of the state
 - Savings still automatically equals investment
 - New growth theory does not generate testable hypotheses

Discussion questions

1. Are the assumptions of the neoclassical growth model realistic? Does it matter or does the model give us a useful perspective on the growth process?
2. Does the introduction of increasing returns to scale resolve the problems of the neoclassical growth model? Why or why not?