

Economic Growth III

9/16/2008

Today's Agenda

1. Prediction of Solow for relative growth rates
2. "Correlation does not imply causation"
3. Endogeneity of Savings, Multiple Steady States

1. Predictions for growth rates

Last time: We saw that differing levels of investment/savings in the Solow model can lead to large differences in relative income levels. Solow predictions are smaller than we actually observe.

A. What does the model say about large difference in growth rates among countries?

- Cannot explain long-run growth—remember: no growth in steady state!
- In thinking about relative growth rates, think about *transitional* growth
- Convergence towards steady state: process by which country's per-worker output moves from initial level to SS level (which is determined by investment level)
- (Can show mathematically) Further a country from its steady state, the faster it will move towards it

B. A Non-Economic example

C. Three predictions

- i) Same investment rate, different income levels → low-income country grows faster
- ii) Different investment rate, same income → higher investment country grows faster
- iii) Raise SS investment rate → higher SS income, higher transitional growth rate

D. Augmented Solow Model

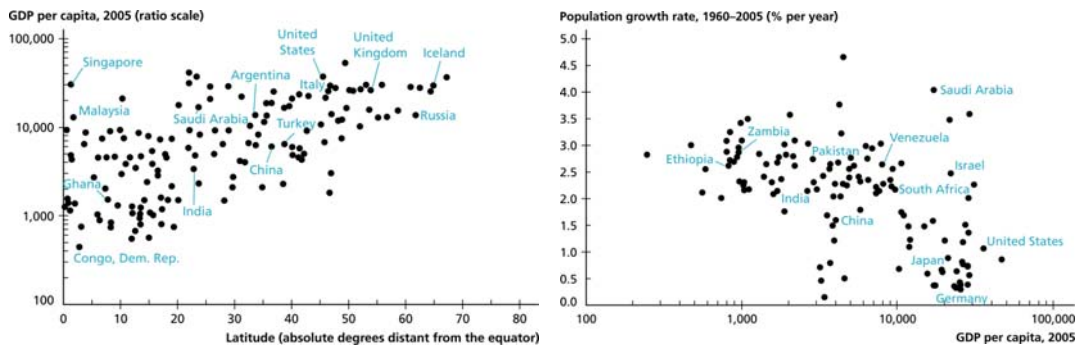
- Above predictions only true if investment rate is the only difference between countries, like in our simple Solow framework
- We can also think about human capital in addition to physical capital as input into production. Then spending on education or health will also be determinant of steady state.
- Mankiw, Romer, Weil: “A Contribution to the Empirics of Growth” (QJE 1992)
- The empirical growth literature, cross-country growth regressions and the search for identification....

2. Correlation vs. Causation (again)

$$Y = X\beta + \varepsilon$$

Does X cause Y?

A. Correlation



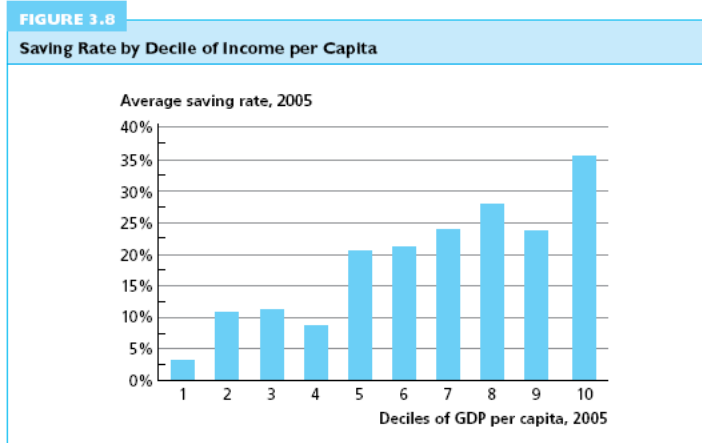
- Degree to which two variables move together
- Degree of correlation (between -1 and 1) measured by correlation coefficient
- Reasons why two variables are correlated: X causes Y, Y causes X or Z causes both X and Y. From a simple regression, we don't know.

B. Endogeneity

- X exogenous in first case, endogenous in other two
- Particular econometric techniques can tease out causation going for $X \rightarrow Y$, but otherwise our model is not “well-identified” and we cannot claim causality
- Example of instrumental variable literature in growth—Acemoglu et al; Werker et al.

3. Endogeneity of the Savings Rate

- Last time: savings rate may vary by income
- More evidence:



Sources: Author's calculations using data from Heston et al. (2006) and World Bank (2007a).

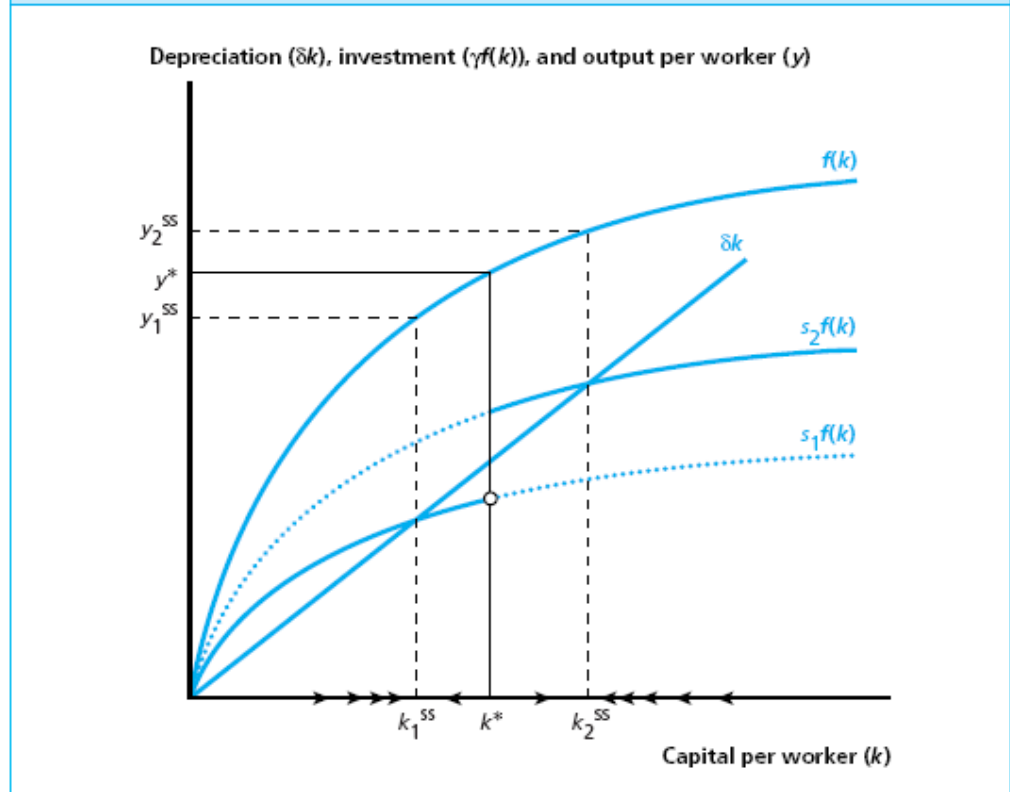
- Constraints or incentives?
- Aside: savings vs. investment

A. Endogeneity of Savings and Traps

- Consider a case where savings depends of income in an extreme fashion: There are two possible rates of saving: s_1 (low) and s_2 (high) which are determined by income per worker in the economy. So if, income is above a threshold y^* , then the savings rate is s_2 and if income per worker is below y^* , then the savings rate is s_1 .

FIGURE 3.9

Solow Model with Saving Dependent on Income Level



- Self-reinforcing behavior
- Initial conditions matter
- Another thought exercise: Say savings rate increased with income gradually (unlike the discrete threshold we have used) and say, only one steady state. What does this imply for process of convergence towards steady state?
- We can think of such “traps” as applying to individuals as well, causes of persistent inequality

Next time: Inequality and Development (Chapter 7)

