The Role of Capital

Real Income per worker = $A_t(K_t/L_t)^{1/3}$

The Basic Equation

- A good equation for describing the National Income at time t is:
  
  $\text{Real Income} = A_tK_t^{1/3}L_t^{2/3}$
  
  $\text{Real Income per worker} = (A_tK_t^{1/3}L_t^{2/3})/L_t$

- That is, the amount of capital per worker matters
Europe after World War II

- Europe was devastated after World War II
- In our terms, 
  \[ A_{t}(K/L_{t})^{1/3} \text{ for Europe} < A_{t}(K/L_{t})^{1/3} \text{ for US} \]
- Europe’s devastation was due to the lower capital stock.

Europe Caught Up

- Europe Caught Up
  - Marshall Plan
  - American Private Investment
  - A lot of hard work on the part of Europeans

Rebuilding Capital

Real Income per worker = \[ A(K/L)^{1/3} \]

- Suppose a nation is devastated by a war, resulting in a sharp decline in capital per worker.
  - Income per worker will decline.
  - It can be restored to its old level by rebuilding the capital stock.
The Role of Capital

Miller’s Pizzeria

• Can make many points through this simple example.
• Will return to the Pizzeria throughout the course.

An Analogy: Miller’s Pizzeria

Real Income per worker = \(A(K/L)^{1/3}\)

• You are the owner of Miller’s Pizzeria.
  – It burns; output is down
  – When you rebuild, you restore output.

The Fallacy

Real Income per worker = \(A(K/L)^{1/3}\)

• I decide to go into the pizza business.

A = 0

The Fallacy

Real Income per worker = \(A(K/L)^{1/3}\)

• I decide to go into the pizza business.

A Second Fallacy

Real Income per worker = \(A(K/L)^{1/3}\)

• My pizzeria is very successful.
  – To be even more successful, I buy even more machines.

A Second Fallacy

Real Income per worker = \(A(K/L)^{1/3}\)

• My pizzeria is very successful.
  – To be even more successful, I buy even more machines.
  – Added productivity occurs at a decreasing rate.
  – In terms of the equation, with \(A(K/L)^{1/3}\), doubling capital increases output by 25%.
Applying to Nations

*Real Income per worker* = \(A(K/L)^{1/3}\)

- The same fallacies applies to nations.
  - Output depends on both capital and technology.
  - Capital alone is not enough.

A New Marshall Plan?

- Some suggest a new Marshall Plan for the really poor nations of the world.
  - We solved got Europe on its feet after WWII with the first Marshall Plan.
  - Why not do the same for poor nations?

A New Marshall Plan?

- Some suggest a new Marshall Plan for the really poor nations of the world.
- The two fallacies catch up with you.

A New Marshall Plan?

- Some suggest a new Marshall Plan for the really poor nations of the world.
- The two fallacies catch up with you.

\[ Real \text{ Income per worker} = A(K/L)^{1/3} \]

- Capital will not do the job if \(A\) is small
- You cannot overcome a small \(A\) with capital investment. There are diminishing returns
End