

# Productivity: Efficiency and Technology Open Economy and Capital Mobility

CEE Growth & Development

UPCES

Michaelmas 2013

# Lucas (1990)

Why doesn't Capital Flow from Rich to Poor Countries?

Firm profit maximisation:

$$\begin{aligned}MP_r &= 0 \\ [TR - TC]' &= 0 \\ [pY - (wL + rK)]' &= 0\end{aligned}$$

Profit maximisation condition:

$$\begin{aligned}MR_K &= MC_K \\ (V)MP_K &= r\end{aligned}$$

Equilibrium capital:

$$\alpha Ak^{\alpha-1} = r$$

# Lucas (1990)

Why doesn't Capital Flow from Rich to Poor Countries?

Production function:

$$y = Ak^\alpha$$

Equilibrium capital:

$$\begin{aligned}\alpha Ak^{\alpha-1} &= r \\ k &= \left(\frac{\alpha A}{r}\right)^{\frac{1}{1-\alpha}}\end{aligned}$$

Equilibrium interest rate:

$$y = (A\alpha^\alpha)^{\frac{1}{1-\alpha}} \left(\frac{1}{r^*}\right)^{\frac{\alpha}{1-\alpha}}$$

# Lucas (1990)

Why doesn't Capital Flow from Rich to Poor Countries?

Equilibrium:

$$y^{CZ} = (A\alpha^\alpha)^{\frac{1}{1-\alpha}} \left( \frac{1}{r^{CZ}} \right)^{\frac{\alpha}{1-\alpha}}$$

Two countries:

$$\frac{y^{CZ}}{y^{DE}} = \frac{(A\alpha^\alpha)^{\frac{1}{1-\alpha}} \left( \frac{1}{r^{CZ}} \right)^{\frac{\alpha}{1-\alpha}}}{(A\alpha^\alpha)^{\frac{1}{1-\alpha}} \left( \frac{1}{r^{DE}} \right)^{\frac{\alpha}{1-\alpha}}} = \left( \frac{r^{DE}}{r^{CZ}} \right)^{\frac{\alpha}{1-\alpha}}$$

# Lucas (1990)

Why doesn't Capital Flow from Rich to Poor Countries?

Lucas answer (human capital):

$$y = Ahk^\alpha$$

Balassa-Samuelson 'answer':

$$\frac{y^{CZ}}{y^{DE}} = \frac{(A\alpha^\alpha)^{\frac{1}{1-\alpha}} \left(\frac{1}{r^{CZ}}\right)^{\frac{\alpha}{1-\alpha}}}{(A\alpha^\alpha)^{\frac{1}{1-\alpha}} \left(\frac{1}{r^{DE}}\right)^{\frac{\alpha}{1-\alpha}}} = \left(\frac{(r/p)^{DE}}{(r/p)^{CZ}}\right)^{\frac{\alpha}{1-\alpha}}$$

Productivity:

$$A = \text{Technology} \cdot \text{Efficiency}$$

Overheating theory:

It does, and it is not always good!

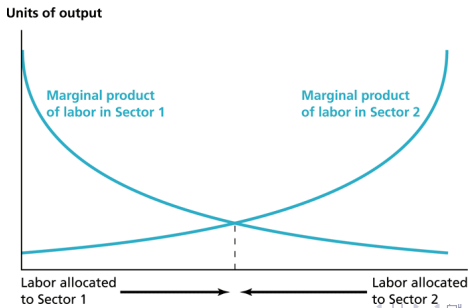
# Balassa-Samuelson (or Penn) Effect

Two countries (A and B) and two sectors (T and NT).  
Non tradable sector:

$$MPL_{nt,A} = MPL_{nt,B} [= 1]$$

Labour market equilibrium:

$$p_{nt,A} \cdot MPL_{nt,A} = w_A = p_t \cdot MPL_{t,A}$$



## Balassa-Samuelson (or Penn) Effect

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$$p_{nt,A} = w_A = p_t \cdot MPL_{t,A}$$

Assume country A more productive:

$$MPL_{t,A} > MPL_{t,B}$$

$$p_{nt,A} > p_{nt,B}$$

# Productivity and Efficiency

Productivity:

$$A = \textit{Technology} \cdot \textit{Efficiency}$$

# Sources of inefficiency

- Idle resources and unproductive activities
  - unemployment, overeducation, 'krysha', and rent-seeking
- Misallocation of factors (among sectors and firms)
- Production and technological blocking (Luddites)
- Missing markets
  - e.g. financial
- Institutional inefficiencies