MACRO GRAD

26 Feb 2009

Barro "Economic Growth in a Cross-Section of Countries"

$$\frac{\dot{y}}{y} = \frac{\dot{Y}}{Y} - \frac{\dot{A}}{A} - \frac{\dot{L}}{L} \Longrightarrow \frac{\dot{Y}}{Y} - \frac{\dot{L}}{L} = \frac{\dot{A}}{A} + \frac{\dot{y}}{y}$$

↑ growth rate of output per worker

$$= g + \frac{\dot{y}}{y}$$

in SS, $\dot{y} = 0$ because $\dot{k} = 0$

so in SS, output per worker grows at rate g

OUT OF SS:

$y = y(t)$

$k = k(t)$

$$y = k^{\alpha}$$

$$\dot{y} = \alpha k^{\alpha-1} \dot{k}$$

$$\boxed{\frac{\dot{y}}{y} = \alpha \frac{k^{\alpha}}{k^{\alpha}} \cdot \frac{\dot{k}}{k} = \alpha \frac{\dot{k}}{k}}$$

$$\frac{\dot{k}}{k} = s k^{\alpha-1} - (\delta + n + g)$$

$$\frac{\dot{y}}{y} = \alpha s k^{\alpha-1} - \alpha(\delta + n + g)$$

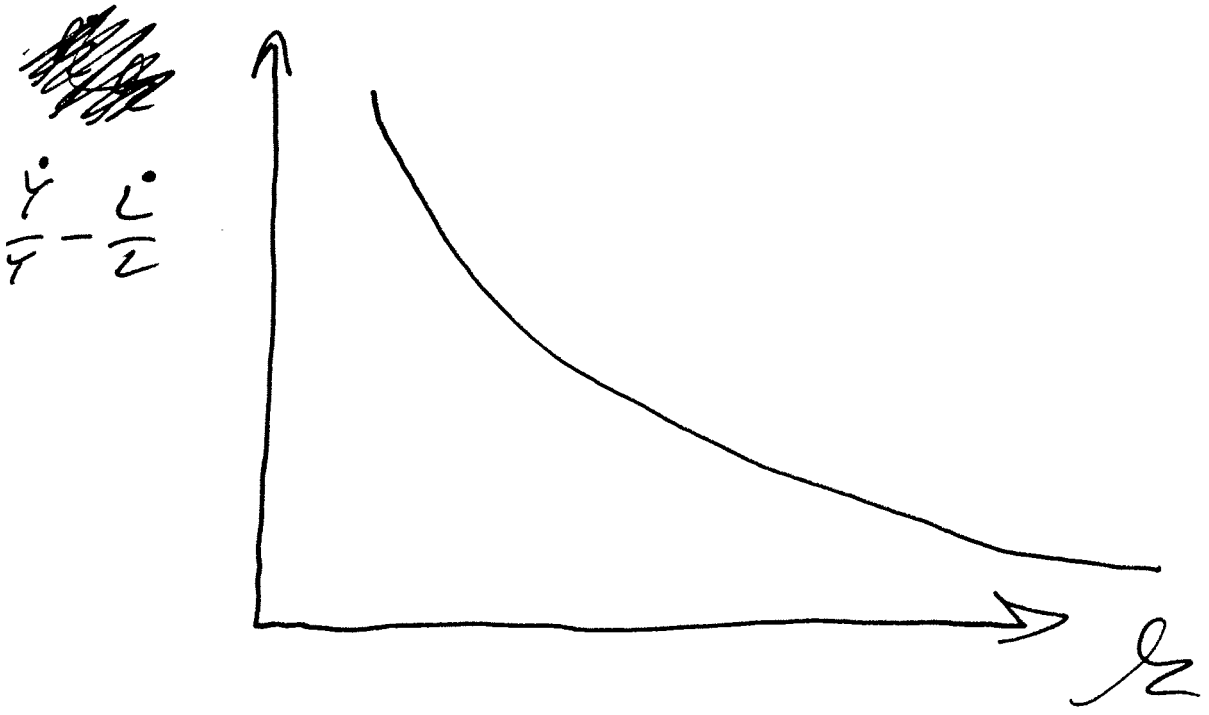
$$\frac{\dot{Y}}{Y} - \frac{\dot{L}}{L} = \alpha s k^{\alpha-1} - \alpha(\delta + n) + (1-\alpha)g$$

output per worker's growth rate

→ increasing in g

→ decreasing in n

→ decreasing in k



If all economies have same structural parameters, then they will all converge to same level of output per eff labor

$$y_{ss} = \left(\frac{s}{s+n+g}\right)^{\frac{\alpha}{1-\alpha}}$$

countries that start with lower level of output per {worker, eff labor} will grow faster

but Barro finds little correlation between initial $\frac{Y}{L}$ and growth rate

→ human capital
→ fertility & investment
→ gov't expenditures
→ others
  - political instability
  - econ system
  - mkt distortions

Idea human capital

→ Barro proxies human capital w/ school enrollment rates and finds that growth rates are positively correlated with the human capital proxies

fertility & investment ← school enrollment

→ more human capital associated with lower net fertility

$$y_{ss} = \left(\frac{s}{\delta + n + g}\right)^{\alpha/1-\alpha}$$

→ more human capital associated w/ greater share of investment in GDP

~~[illegible]~~

$$Y = C + I + G$$

$$S = Y - C - G$$

$$S = I$$

$$s \equiv \frac{S}{Y} = \frac{I}{Y}$$

gov't expenditures

→ in previous work, Barro found a negative correlation betw/n (govt consumptn/y) & investment

$$s = \frac{S}{Y} \quad \text{and} \quad S = Y - C - G$$

→ Barro finds significant neg correlatn betw/n (gov't cons/y) & growth

elsewhere