- Health causes income

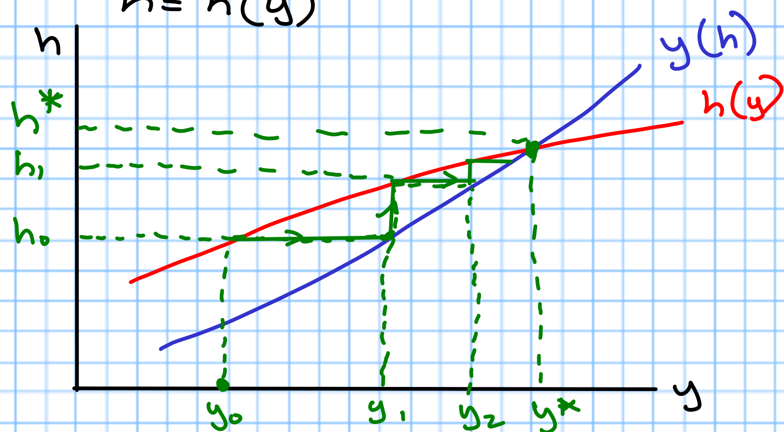
$y = y(h)$

↑ income ↑ heath

income is a function of health

- Income causes health:

$h = h(y)$

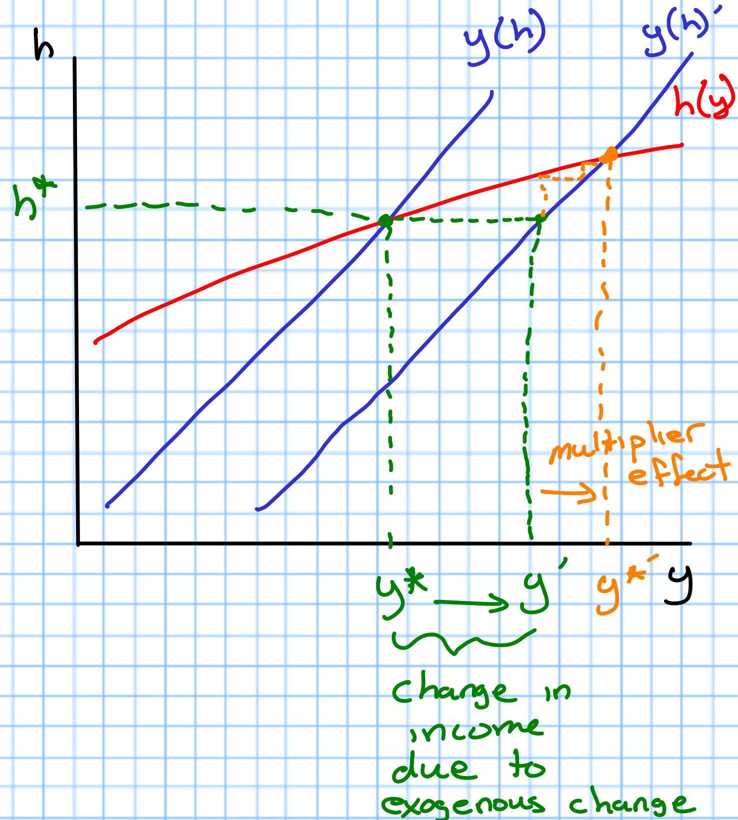


y_0 is initial level of income

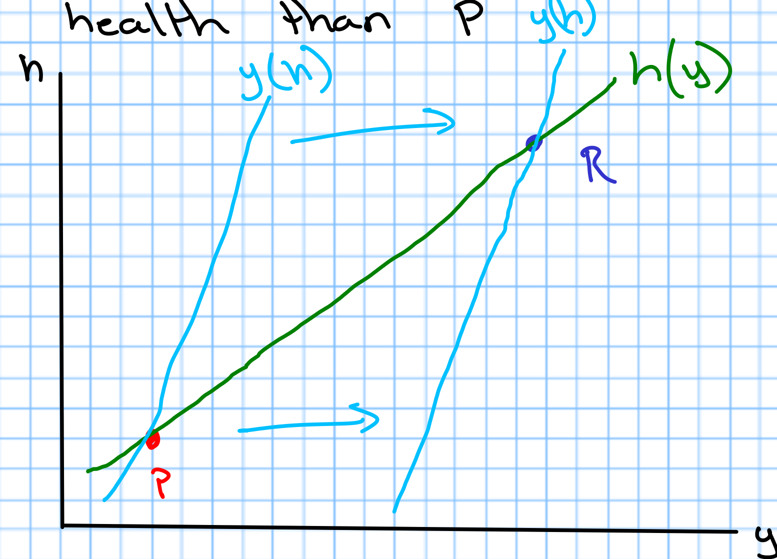
- Suppose there is an exogenous change to income

→ something that causes income to change, but doesn't affect health

→ productivity increase (technology), business cycle, government expenditures, etc

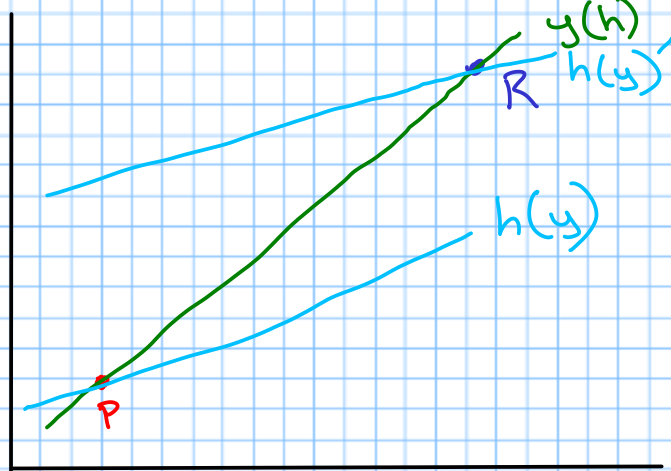


Let's suppose we observe two countries, R and P
We observe that R has higher income and better health than P



If P wants to increase y and h, what should they do?

→ Target policies that promote income growth



→ P should target health policies

→ It's difficult (impossible?) to determine which of these two situations is describing the difference between R and P

Cobb-Douglas production with human capital

Before: $Y_t = K_t^\alpha L_t^{1-\alpha}$

Now: $Y_t = K_t^\alpha (hL_t)^{1-\alpha}$

Assume $L_t = \bar{L}$ $\underbrace{\forall t}_{\text{at every point in time}}$

Express $F(K_t, hL_t)$ in per-worker terms

$$\frac{Y_t}{\bar{L}} = \frac{K_t^\alpha (h\bar{L})^{1-\alpha}}{\bar{L}}$$

$$y_t = K_t^\alpha h^{1-\alpha} (\bar{L})^{1-\alpha} (\bar{L})^{-1}$$

$$y_t = K_t^\alpha h^{1-\alpha} (\bar{L})^{-\alpha}$$

$$y_t = \frac{K_t^\alpha h^{1-\alpha}}{(\bar{L})^\alpha}$$

$$\underline{y_t = k_t^\alpha h^{1-\alpha}}$$

Solow model

$$K_{t+1} = K_t + I_t - D_t$$

$$\frac{K_{t+1}}{\bar{L}} = \frac{K_t}{\bar{L}} + \gamma \frac{Y_t}{\bar{L}} - \delta \frac{K_t}{\bar{L}}$$

$$k_{t+1} = k_t + \gamma y_t - \delta k_t$$

$$k_{t+1} = k_t + \gamma k_t^\alpha h^{1-\alpha} - \delta k_t$$

$$k_{t+1} - k_t = \gamma k_t^{\alpha} h^{1-\alpha} - \delta k_t$$

$$\Delta k_t = \underbrace{\gamma k_t^{\alpha} h^{1-\alpha}} - \underbrace{\delta k_t}$$

Suppose there are two countries i and j identical in every way except

$$h_i > h_j$$