Feb 1st:

Recap of previous class:

- $y = \bar{A} k^{1/3} L^{2/3}$

- CRS: $Y(2k, 2L) = 2Y(k, L)$

- Diminishing return to k: $MPk = \dfrac{dY}{dk} = \dfrac{1}{3} \dfrac{Y}{k}$

- Profit max condition:
  $r = MPk$
  $w = MPL$

- $y^* = \dfrac{Y^*}{L^*} = \bar{A} \left(\dfrac{\bar{k}}{\bar{L}} \right)^{1/3} = \bar{A} k^{1/3}$

  $k = \dfrac{\bar{k}}{\bar{L}} = $ capital per person

- key determinants:

  - higher TFP

  - more capital/person

- exponents are the share of national income that goes to each factor

$$\frac{WL}{Y} = \text{share of national income goes to workers}$$

$$\frac{WL}{Y} = \frac{\frac{2}{3}\frac{Y}{L} \cdot L}{Y} = \frac{2}{3} = \text{exponent of } L$$

Shares go to capital:

$$\frac{rK}{Y} = \frac{\frac{1}{3}\frac{Y}{K} \cdot K}{Y} = \frac{1}{3} = \text{exponent of } K$$

Analysis wealth:
- Assume every country has $\bar{A} = 1$

$US = 1$
$y_{mean} = 0.734$, $k_{mean} = 0.930$

- model seems to systematically predict that countries should be richer than they are

- our assumption that $\bar{A} = 1$ is maybe wrong

  - allows for differences in $\bar{A}$ could improve our model's fit
  - $\bar{A} \Rightarrow$ higher efficiency of capital and labour
  - identified via the residual

Why $\bar{A}$ matters more? Diminishing returns to capital

Approx half the diff. in living standards → due to differences in TFP

$$\frac{Y_{rich}}{Y_{poor}} = 64$$

$$\frac{Y_{rich}}{Y_{poor}} = \frac{\overline{A}_{rich} \, \overline{K}_{rich}^{1/3}}{\overline{A}_{poor} \, \overline{K}_{poor}^{1/3}}$$

$$= \left(\frac{\overline{A}_{rich}}{\overline{A}_{poor}}\right)\left(\frac{k_{rich}}{k_{poor}}\right)^{1/3}$$

$$= (3)(5)$$

- share due to $\Delta \overline{A}$: $\frac{13}{13+5} \times 100\%$ = $\boxed{72.2\%}$

Share due to ΔK : $\frac{5}{13+5} \times 100\%$ = 27.8%

Why does A vary?

- Quality of institutions:
  - gov't policies & rules and regulations

  - property rights
  - rule of law
  - contract enforcement
  - stable political system
  - ensure civil liberties

- human capital : skills individuals have
  - education & job training

- technology