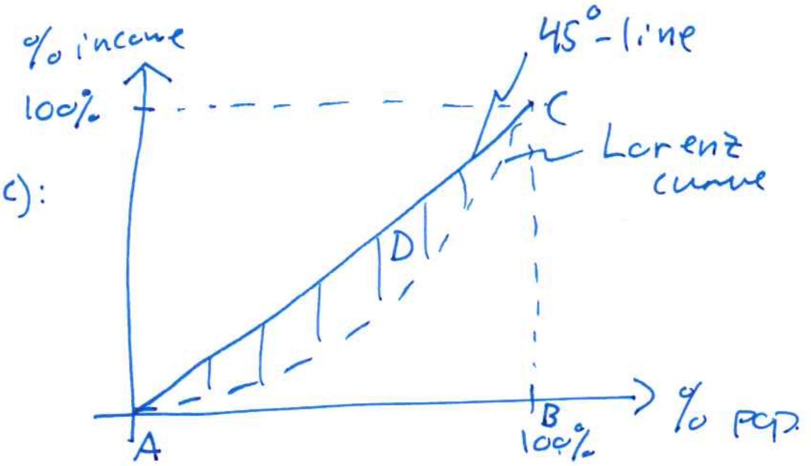
Solution to Søk 2007 Dev. Ecs (spring 2016)

#1 a) Lorenz curve

- Sort the population on income (from lowest to highest).
- Calculate the first one (or some other number) percent of the population's percent of total income, then calculate the first and second percent of the population's percent of total income, and so on...
- Plot these cumulative numbers in a figure:



b) Gini coefficient (GC):

$$GC = \frac{D}{ABC}$$

GC is a measure of (income) inequality.

If everyone has the same income, then the Lorenz curve and the 45°-line coincide.

If $D=0$, $GC = \frac{0}{ABC} = \frac{0}{0{,}5} = 0$.

If $D = ABC$ (all income is held by the richest person), $GC = \frac{ABC}{ABC} = 1$.

c) - It does not say anything about
  - income distribution
    - How many are living in absolute poverty?
  - other important characteristics
    - health
    - education
    - freedom etc

- It is not PPP-adjusted

1 a) The impact of aid on growth found to depend on:

- the quality of institutions
- the quality of policies

Policies are fiscal policies (budget deficit), monetary policies (inflation) and trade policy (openness).

Lectures based on Burnside and Dollar (2000).

#2

We expect the students to use the O-ring theory for this problem.

If the company starts production of paper clips, we should expect

$$\pi_{pc} > \pi_{sp} \iff q_A + q_C > (1+q_B)\,q_C$$

$$\iff \frac{q_A}{q_C} + 1 > 1 + q_B \iff \boxed{q_B < \frac{q_A}{q_C}}$$

This inequality can be satisfied if

1 q_B is low $\left(0{,}3 < \frac{0{,}1}{0{,}2}\right)$

2 q_A is high $\left(0{,}7 < \frac{0{,}4}{0{,}5}\right)$

3 q_A and q_C are quite similar/ $\left(0{,}9 < \frac{0{,}1}{0{,}11}\right)$
q_C is low

↳ It seems like the quality of the medium-quality workers are very important. How are they *relative* to the other workers? Will only produce smart phones if q_B and q_C are "relatively equal."

A possible consequence is that the country get caught in a low-income trap.
If skill is not valued, people do not have any incentive to acquire more skills.
↳ There will only be low-skilled / low paying jobs ⇒ No money for education and so on.

(see chapter 4.5 for details and further discussion.)

3 a)

Productivity growth is a function of innovation $g(H)$ and technology adoption $c(H) \cdot \left[\frac{T(t)}{A(t)} - 1 \right]$.

Both are positive functions of human capital.

The impact of increased human capital:

First solve the model and find steady state level of relative productivity.

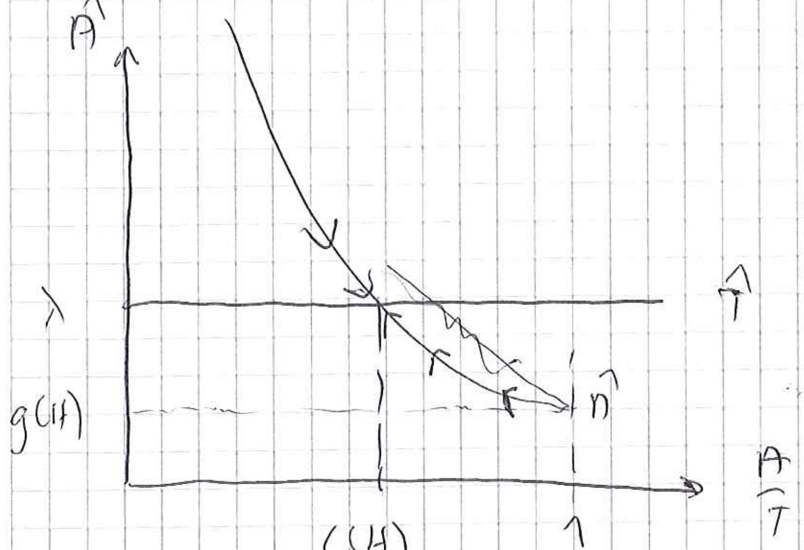
It's also relevant to discuss the dynamics.

$$\frac{\partial \hat{A}}{\partial \left(\frac{A}{T}\right)} = - \frac{c(H)}{\left(\frac{A(t)}{T(t)}\right)^2} < 0$$

Dynamics: $\hat{A} > \hat{T} \Rightarrow \frac{A}{T} \uparrow$

$\hat{A} < \hat{T} \Rightarrow \frac{A}{T} \downarrow$

$\hat{A} = \hat{T} \Rightarrow \frac{A}{T}$ constant



$$\frac{c(H)}{c(H) - g(H) + \lambda}$$

Long run equilibrium:

$$\hat{n} = \hat{T} \Rightarrow g(H) + c(X)\left[\frac{T(t)}{A(t)} - 1\right] = \lambda$$

$$\Rightarrow \left(\frac{A}{T}\right)^* = \frac{c(H)}{c(H) - g(H) + \lambda}$$

Steady state level ~~of~~ of relative productivity.

Effect of ~~a~~ increased H:

$$\left(\frac{A}{T}\right)^* = \frac{c(H)}{c(H) - g(H) + \lambda}$$

$$\Rightarrow \frac{1}{\left(\frac{A}{T}\right)^*} = \frac{c(H) - g(H) + \lambda}{c(H)}$$

$$= 1 - \frac{g(H)}{c(H)} + \frac{\lambda}{c(H)}$$

$$= 1 + \frac{\lambda - g(H)}{c(H)}$$

$$H \uparrow \Rightarrow c(H)\uparrow$$

$$H \uparrow \Rightarrow g(H)\uparrow \Rightarrow \lambda - g(H)\downarrow \Bigg\} \Rightarrow \frac{\lambda - g(H)}{c(H)}\downarrow$$

$$\Rightarrow \frac{1}{(A/T)^*}\downarrow \Rightarrow \left(\frac{A}{T}\right)\lambda$$

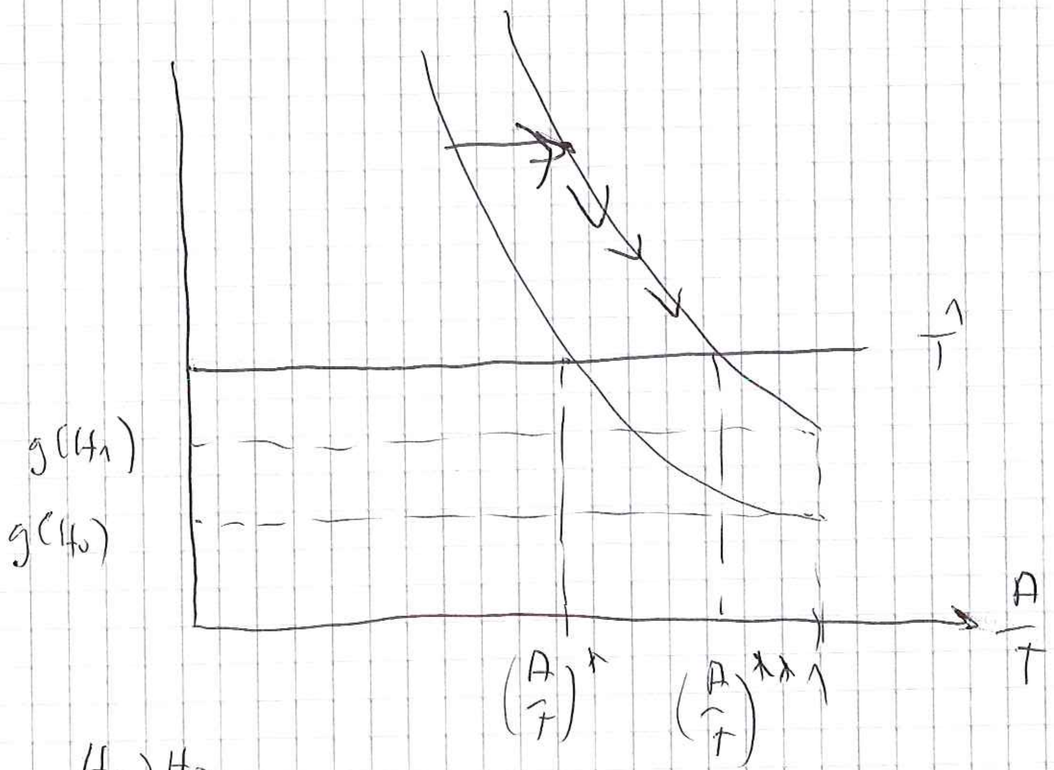
Increased H increases relative productivity

in the long ~~and~~ run.

Works both through adoption and

innovation.

Graphically:



$H_1 > H_0$

Long run growth is exogenous

Transition growth is higher and

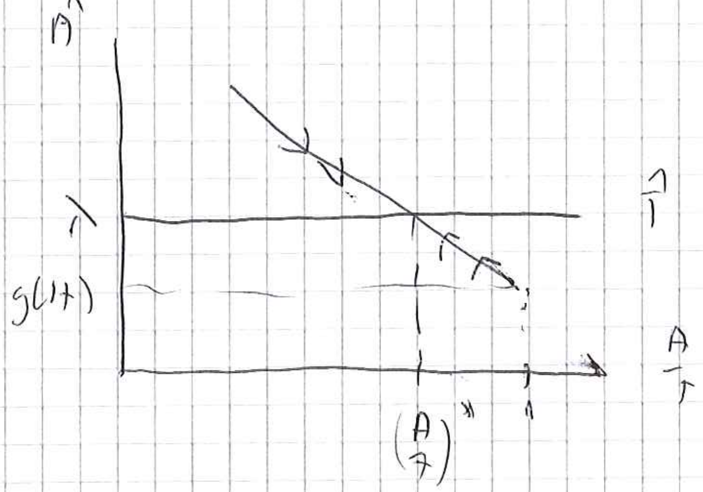
contributes to an increase in the

long run level of relative productivity.

b)
$$\hat{A}(t) = g(H) + c(H)\left[1 - \frac{A(t)}{T(t)}\right]$$

$\Rightarrow$ Linear relationship between $\hat{A}$ and relative productivity

Graphically



$$\left(\frac{A}{T}\right)^* = \frac{c(H) + g(H) - \lambda}{c(H)} \quad \text{if} \quad c(H) + g(H) > \lambda$$

If $c(H) + g(H) \leq \lambda$, $\left(\frac{A}{T}\right)^* = 0$

Thus, the model ~~of~~ open ~~of~~ up for income divergence if the human capital level is low enough.