

$$9 + 6 + 7 = 22/30$$

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EE312 Macroeconomics, 1/2020 (Sec. 046401)

Homework: Ch.7 A Closed Economy One-Period Macroeconomic Model

Deadline of submission 28 October in the class.

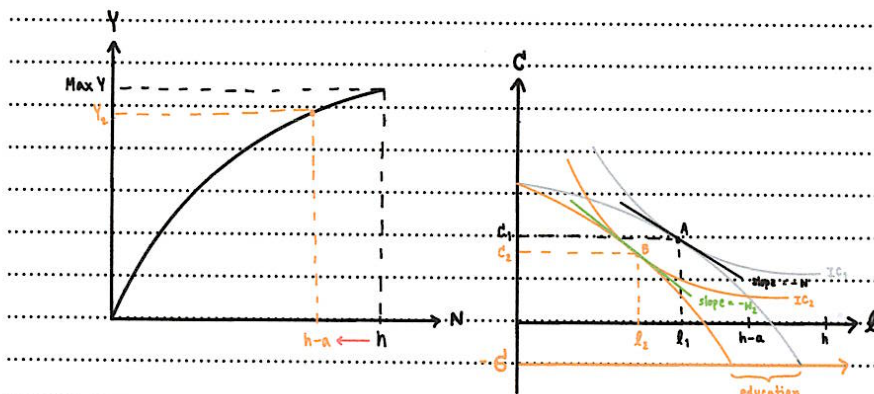
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- In one-period model, education can be represented as time spent by the representative consumer that is neither leisure nor time applied to producing output. What the economy gains in the future is that the representative consumer then has more time available, as measured in terms of effective units of labour time (adjusted for skill level, or what economists call human capital).
 - Using the one-period model, show what effects additional education has in the present on consumption, leisure, employment, aggregate output, and the real wage.
 - Similarly, show the effects of the additional education that people acquire today will have in the future consumption, leisure, employment, aggregate output, and the real wage.
 - What does your analysis in parts (a) and (b) have to say about trade offs society makes between the present and the future in investing in education.

(a.) 1.) Without education : We have h hours.

2.) With education : We have $h-a$ hours : a = hours of education.

$$h = N + l$$

$$h - a = N + l$$



(1) Education $\rightarrow$ $h \downarrow \rightarrow$ PPF $\downarrow$

(2) IC $\downarrow$ tangent PPF at $\odot$: $C \downarrow, l \downarrow$

(3) at Point $\odot$: slope $\uparrow$ (steeper) : $w \uparrow$

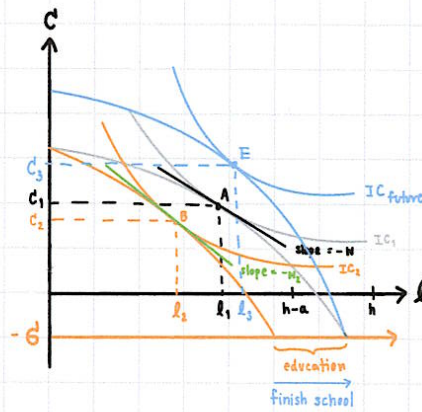
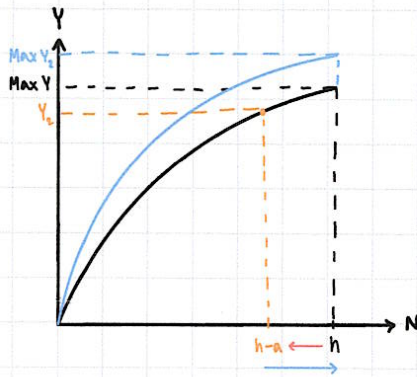
(1) From Production function : since $N \downarrow \rightarrow Y \downarrow$

(2) From GE : [A to B] : $C \downarrow, l \downarrow$

(3) Slope BL, ISM are steeper : $w \uparrow$

So, $C \downarrow, l \downarrow, N \downarrow, Y \downarrow, w \uparrow$

(b.) In the future $\begin{matrix} \swarrow \\ h-a \rightarrow h \\ \searrow \\ MPN \uparrow \end{matrix}$



Since $MPN \uparrow Y \uparrow \rightarrow N^d \uparrow \rightarrow w \uparrow$

(i) consume : $w \uparrow$ SE : $w \uparrow \rightarrow c \uparrow, l \downarrow$

IE : $w \uparrow \rightarrow Y^d \uparrow \rightarrow c \uparrow, l \uparrow$

TE : $w \uparrow \rightarrow c \uparrow, l$ ambiguous

So, $c \uparrow, l \uparrow, N \uparrow, Y \uparrow, w \uparrow$

(c.) Increasing in Education has will immediatly decrease social welfare, due to reduction of consumption & hours of leisure but will compensate the future consumption & leisure hours after schooling.

trade-off ? is it worth to have education ?

benefit vs. cost

2. Suppose that government spending makes private firms more productive; for example, government spending on roads and bridges lowers the cost of transportation. This means that there are now two effects of government spending, the first being the effects discussed in this chapter of an increase in G and the second being similar to the effect of an increase in the nation's capital stock K .

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- (a) Show that an increase in government spending that is productive in this fashion could increase welfare for the representative consumer.
- (b) Show that the equilibrium effects on consumption and hours worked for an increase in government spending of this type are ambiguous but that output increases. You must consider income and substitution effects to show this.

a) If government spending makes private firm more productive, then it is actually indirectly benefiting the end consumer as the cost of production will go down and profit will go up but due to competition these swollen profits will be decreased as firms will be giving a substantial part of this extra benefit to the consumer by most probably lowering the price.

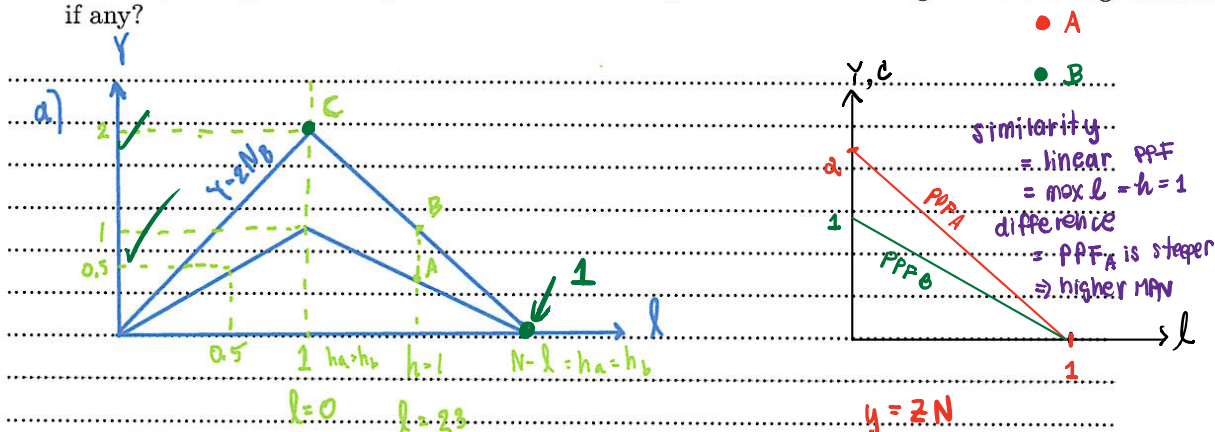
b) - output of the economy will increase as the lower cost of production will push firms to produce more, hence increasing the total output of the economy.
- Now the effect on consumption and hour worked can move in both the direction due to income and substitution effect depending upon the factor that which effect is stronger.
- As price will go down, people will have a feeling as if their incomes have increased so due to income effect they will go down, people will lean more to leisure and will want to work less but substitution effect will work in opposite direction as people will need to work more to buy more leisure. Consumption may increase or decrease because government spending will lower the price on both the normal and inferior goods so its direction actually depends upon the goods basket of the consumer.

graph?

3. Suppose there are but two countries, namely A and B. Each country is indexed by "j" for $j = A$ and B. Both countries have no government, i.e. $G_j = T_j = 0$. Suppose the technology of both countries are linear production in labor hours. That is, $y_j = z_j N_j$ where N_j is the number of working hours in country j and z_j is the level of technology in country j . Suppose that $z_A = 2 > z_B = 1$ and preferences of consumers in both countries are identical

- Assuming a fixed time endowment in both countries to be equal to 1 unit, construct the PPF of each country. Putting both PPFs in the same figure and locate all important points. Comments on the differences and similarities between the two PPFs.
- Determine the competitive equilibrium in both countries. Is there any wage differentials in the equilibrium? Which one of the country is supposed to experience a higher wage? Why? How about the allocation in both countries?
- Redo the problem (a) and (b) above, but instead assume that the labor endowment in both countries are different, i.e. $h_A = 1$ and $h_B = 4$. Comment on the possible sources that generate the wage differentials, if any?

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As production function is a mirror image of PPF, so PPF is downward slope with slope is $-w$. As slope of PPF is the trade off between leisure time and consumption, country B has to sacrifice more leisure time than country A to has 1 more unit of consumption.

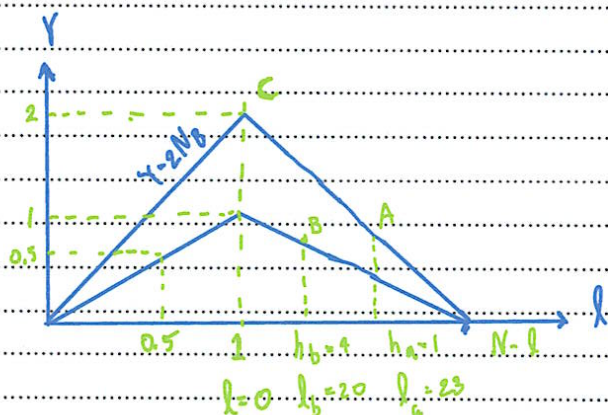
Suppose that endowment on both country equal to 1, so both country work for 1 hour. Country A work at point A and country B work at point B. At the same amount of labour and working hour, country A can produce more output than country B.

b) In competitive market, $w = P \times MPL$ or $\frac{w}{P} = MPL$

As a result, country A is supposed to experience a higher wage because country A's MPL is higher than country B's MPL. Result in labors in country A work more than country B. When labors in country A work more, it indicates the higher output than country B as country A produce more.

c) - Assuming that both country's labor endowments are now different. h_B is now equal to 4 instead of 1.

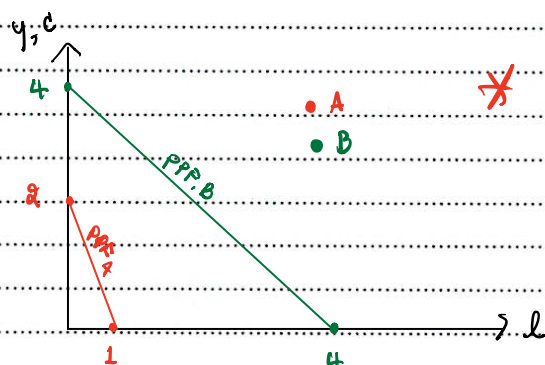
- The country B labor is now working longer than country A.



From the graph, you can see that country B has an increase in output (Y) when there is more h_A and less h_B .

The increase in h_B will also increase the N_S of country B ($N_S = h - l$) which will also rise the real wage equilibrium of country B up. This will also shorten the wage gap between country A and B due to the increase in w of B.

Comment:



* source of wage differential
= productivity of worker. *