

Course in Macroeconomics and Global Economics  
University of Rome 'Tor Vergata'  
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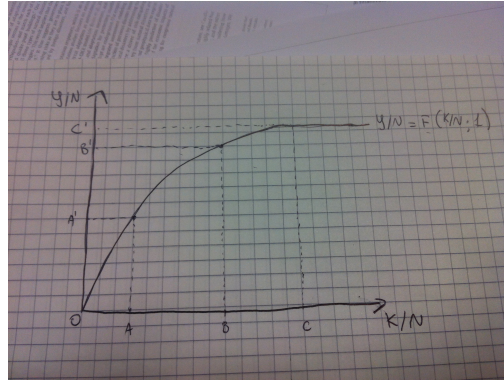
## Practice 7 Solutions

### Exercise 1

- UK consumption per-capita: 5000£
- Mexican consumption per-capita: 6000 pesos
- if 1£= 10 Pesos we get:  
Mexican consumption per-capita=600£
- Using PPP: Mexican consumption per-capita in Pounds:  
 $1£ * 400 + 2£ * 200 = 800£$
- Exchange rate method:  $600/5000=12\%$   
PPP method:  $800/5000=16\%$

### Exercise 2

- $Y=81^{0.7} * 49^{(1-0.7)}=69.56$
- $Y=162^{0.7} * 98^{(1-0.7)}=139.43$
- Yes, it is characterized by Constant Returns to Scale
- $\frac{Y}{N} = \frac{K}{N}^{(1-\alpha)}$
- 1.52 and 1.87. It does not double.
- No. Increases in capital per worker lead to smaller and smaller increases in output per worker.
- Differently from the previous answer, here the relation does not exhibit Constant Returns to Scale since in this case we are doubling one factor leaving the other unchanged, not capital and labor in equal proportion. There are decreasing returns to capital.



### Exercise 3

We know that the per capita real GDP is  $GDP_{pc} = RealGDP/population$

1. *Average per-capita real GDP growth rate*

$$r = \left[ \left( \frac{GDP_{pc_t}}{GDP_{pc_{t-1}}} \right)^{m/n} - 1 \right] * 100$$

where  $m$  is the periodicity of the data (1 for annual data, 4 for quarterly data etc) and  $n$  is the number of periods between the earlier period and the later period.

In logarithmic scale  $r = [(\ln GDP_{pc_t} - \ln GDP_{pc_{t-1}}) * m/n] * 100$

#### USA:

1970-1990: 2.2% and in log 2.18%

1990-2010: 1.44% and in log 1.43%

#### ITA:

1970-1990: 3.76% and in log 3.69%

1990-2010: 1.42% and in log 1.41%

2. *Annual per-capita real GDP growth rate:*

#### USA:

2005-2006: 1.79% and in log 1.78%

2006-2007: 1.04% and in log 1.04%

2008-2009: -4.57% and in log -4.68%

2009-2010: 1.66% and in log 1.65%

2010-2011: 1.28% and in log 1.27%

#### ITA:

2005-2006: 2% and in log 1.98%

2006-2007: 3.35% and in log 3.3%

2008-2009: -5.64% and in log -5.8%

2009-2010: -0.07% and in log -0.07%

2010-2011: 0.25% and in log 0.25%