EC 390 Problem Set 01

Instructions: Answers must be submitted online through the designated Canvas assignment in a **PDF file**. Any other file type is not allowed. This Problem Set is due on **October 08 at 11:59am**. Please write as legible and clearly as possible. You will not be given full credit if your answers cannot be easily understood.

Questions

9 pts

1. [~~7 points~~] What does it mean if someone is living in *absolute poverty*? What is the World Bank's definition of absolute povery? Does it make sense to define poverty in terms of income? Why or why not? (No more than 1 or 2 paragraphs)

   - Absolute poverty means they do not earn or produce enough to meet basic needs
   - World Bank definition is living on less than $2.15 a day
   - Does **not** make sense. Ignores many other relevant factors.

5 pts

2. [~~8 points~~] The **Purchasing Power Parity (PPP)** is defined to be (in your own words):

   Something that mentions ratio of price of a basket of goods between 2 countries

12 pts

3. [~~40 points~~] Use the following information to determine whether there is evidence of **relative convergence, absolute convergence, or both**:

Country	GNI per Capita (2010)	GNI per Capita (2019)
Megaton	$545	$890.21
New Vegas	$350	$458.61

Growth Rate Megaton → $\frac{890.21 - 545}{545}$ = 0.63 = 0.63%.

Since the wealthier Megaton grew faster than poorer New Vegas, there is no relative convergence.

Growth Rate New Vegas → $\frac{458.61 - 350}{350}$ = 0.31 = 31%.

Because there is no relative convergence, there cannot be absolute convergence

4. The prices of goods in Maynooth and Eugene are given below. Note that the prices from Maynooth are measured in € and prices in Eugene are measured in $.

	Maynooth	Eugene
Shoes	€45	$ 55
Sweaters	€35	$ 20
Hat	€20	$ 15

(a) [4 points] Suppose that we define a basket of goods as **two pairs of shoes** and **one sweater**. What is the **purchasing power parity** between Maynooth and Eugene $(P_{May,Eug})$?

$$P_{may} = 2(45) + 35 = 125$$

$$P_{Eug} = 2 \times 55 + 20 = 130$$

$$PPP_{may,eug} = \frac{P_{may}}{P_{eug}} = \frac{125}{130} = 0.96 \text{ euro per } \$$$

$$\hookrightarrow 0.96 \text{ euro} = 1 \text{ dollar}$$

4 pts

(b) ~~[2 points]~~ Suppose that the GNI per capita of Maynooth is € 1,500. Using part (a), what is the **PPP-adjusted** value of Maynooth's GNI per capita (in $)?

$$GNI_{may} = 1,500 \times \frac{1}{0.96} = \$1,562.5$$

4 pts

(c) ~~[2 points]~~ Suppose that the GNI per capita of Eugene is $ 2,500. Using part (a), what is the **PPP-adjusted** value of Eugene's GNI per capita (in €)?

$$GNI_{Eug} = 2,500 \times 0.96 = €2,400$$

5. Consider the city of Hamilton, New York. Let Hamilton follow the Harrod-Domar model of growth.

4 pts

(a) [~~4 points~~] Hamilton's ratio of capital-output is 5.5 and has a savings rate of 22%. At what rate do you expect Hamilton's output to grow?

$$\frac{\Delta Y}{Y} = \frac{s}{c} \quad \longrightarrow \quad Growth = \frac{22}{5.5} = 4\% \text{ per year}$$

4 pts

(b) [~~4 points~~] Hamilton wants to increase the city's growth rate to 7.7%. If Hamilton's capital-output ratio remains at 5.5, what savings rate should Hamilton target if it wants to achieve this growth rate?

$$\frac{\Delta Y}{Y} = 7.7 \quad \longrightarrow \quad \frac{\Delta Y}{Y} = \frac{s}{c}$$

$$7.7 = \frac{s}{5.5}$$

$$s = 42.35\%$$

(c) [4 points] **True or False?** Developing countris can change their savings rate easily. Explain. (Be brief, no more than 1 paragraph)

False.

It is difficult to change savings rates mostly due to low income levels.

6. [10 points] Consider the Solow model discussed in class. Consider a population growth rate increase from n to n'. Show graphically what happens to **capital per worker** (k) and **output per worker** (y).