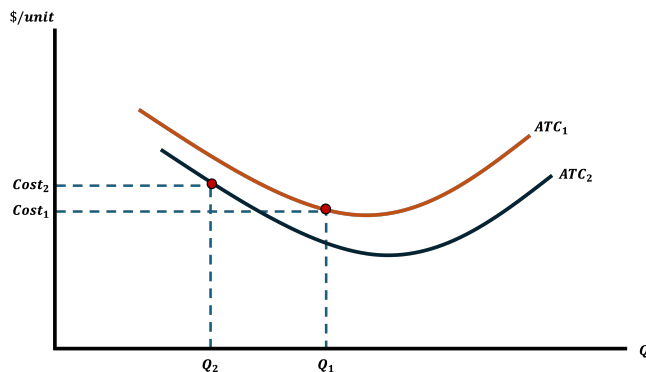


## EC 390 Problem Set 02

**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 22 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.

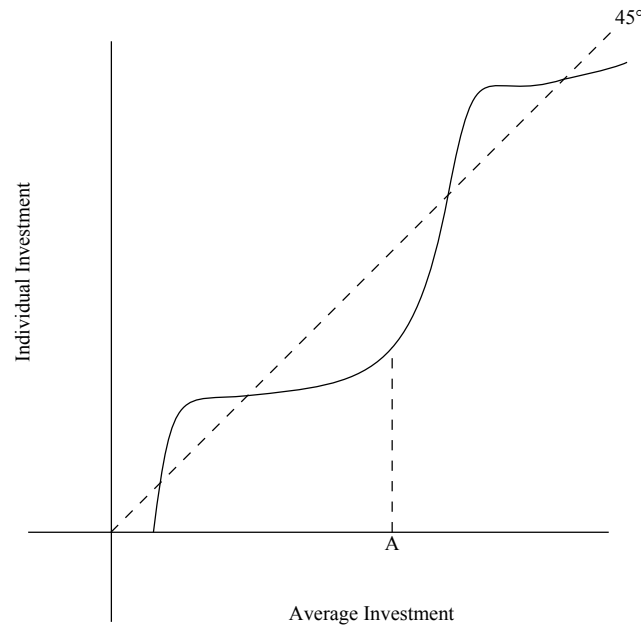
### Questions

1. [10 points] Take the following Average Total Cost Curves below. Firm 1 is an **incumbent firm** and is represented by the orange ATC curve. Firm 2 is an **entering firm** and is represented by the blue ATC curve. They both produce at their shown quantities  $Q_1$  and  $Q_2$  respectively. The y-axis is the per unit cost and the x-axis represents quantity of goods produced. Explain how this graph demonstrates the **firm incumbency advantage** discussed in the multiple equilibria lecture. Explain (Be brief in your explanation).



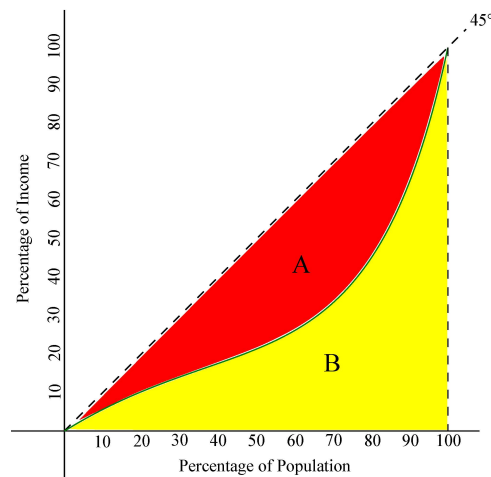
2. [5 points] Consider the Solow model discussed in class. In this country, **women's labor force participation** increases which, in turn, reduces fertility rates in the country. At the same time, since there are fewer dependents, households **can save more**. Show graphically what happens to **capital per worker** ( $k$ ) and **output per worker** ( $y$ ).

3. [2 points] When one agent's actions provide an **incentive** for other agents to take similar actions, we say that there are \_\_\_\_\_ between these actions
4. Consider the following S-curve diagram:



- (a) [2 points] Label the equilibrium points on the graph (Make sure they are identifiable and named)
- (b) [3 points] Classify each equilibrium as **stable or unstable**
- (c) [5 points] Suppose that average investment is currently at point A. Where will average investment end up? **Show the dynamics on the graph by drawing arrows**

5. Consider the following Lorenz Curve



- (a) [2 points] Describe how the **Lorenz Curve** would change if the society had **perfect income equality**
- (b) [2 points] Describe how the **Lorenz Curve** would change if the society had **perfect income inequality**
- (c) [4 points] If we have the area of  $A = 0.15$  and the area of  $B = 0.35$ , what is the **Gini Coefficient** for this society? **Show your work**

6. Consider the O-Ring model. It predicts that there will be a strong tendency for the most productive workers to work together. Let there be 6 workers and 2 firms, where each firm hires 3 workers total. There are 3 high-skill  $q_H$  workers and 3 low-skill  $q_L$  workers, such that  $q_H > q_L > 0$ . Workers can be assigned in either **sorted groups** or **mixed groups**:

- **Mixed Assignment:** Firm 1 hires  $(q_H, q_H, q_L)$  and Firm 2 hires  $(q_H, q_L, q_L)$
- **Sorted Assignment:** Firm 1 hires  $(q_H, q_H, q_H)$  and Firm 2 hires  $(q_L, q_L, q_L)$

(a) [5 points] Compute the total output under each **type of assignment**

(b) [10 points] Show **algebraically** that the sorted assignment yields strictly higher total output whenever  $q_H > q_L$