

ECO 136 Quiz 1 [March 17, 2009]

Q1: Given the following information, compute

- a. Unemployment rate
- b. Labor force participation rate

- Population 15 years and over = 100
- Not-in-Labor-Force = 30
- Employed = 50

A1. Population 15 years and over = Not in Labor Force + Labor Force

$$\Rightarrow \text{Labor Force} = 100 - 30 = 70$$

$$\text{Labor Force} = \text{Employed} + \text{Unemployed}$$

$$\Rightarrow \text{Unemployed} = 70 - 50 = 20.$$

- a. Unemployment rate = $\text{unemployed} / (\text{unemployed} + \text{employed}) = 20/70 = 0.2857$ or 28.57%.
- b. Labor force participation rate = $\text{labor force} / \text{population 15 years and over} = 70/100 = 0.7$ or 70%.

Q2. Consumption function is defined as $C = 100 + 0.75 Y$, $I = 100$.

- a. Derive aggregate expenditure function

$$AE = C + I = 100 + 0.75Y + 100 = 200 + 0.75Y$$

- b. Compute the equilibrium output

$$\text{At the equilibrium, } AE = Y, \text{ therefore, } Y^* = 200 + 0.75Y^*, \text{ solve for } Y^*.$$

$$(1 - 0.75)Y^* = 200, 0.25Y^* = 200, Y^* = 200/0.25 = 800.$$

- c. Compute the equilibrium consumption

$$Y = C + I, \text{ now } Y = 800 \text{ and } I = 100. \text{ Therefore, } C^* = Y^* - I = 800 - 100 = 700.$$

- d. When the economy is at $Y = 200$, what is going to happen? Explain the process to reach the equilibrium point.

When $Y = 200$, $AE = 200 + 0.75 \cdot 200 = 350$. $Y < AE$. This means that unplanned investment (I_{up}) is negative because $I_{up} = Y - AE$. We are observing the unexpected decrease in the inventory, meaning the firms could sell more than they expected. As the result, firms start increasing their output by hiring more people (increase income of employees and then consumption) and employing more inputs. Therefore, consumption and output will increase given these processes until the output level reaches the equilibrium point.

- e. At the equilibrium, we increased Investment by 100 units. How much units of Y will increase? Derive Multiplier, then compute the change in Y .

$$\text{Multiplier} = 1/\text{MPS} = 1/(1-0.75) = 1/0.25 = 4. \Delta Y = (1/\text{MPS}) \cdot \Delta I = 4 \cdot 100 = 400.$$