

180.101 Elements of Macro - TA Section - Week 7

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Slides on https://github.com/QingyuanFang/TA_ElementsOfMacro

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The Aggregate Expenditure Model

- **Aggregate Expenditure:** given total income Y , how much an economy **plans to spend**

$$AE = C + I^P + G + NX$$

- **Actual Output** (how much the economy **actually produced**)

Let's recall the “expenditure approach” of measuring GDP

$$Y = C + I^{Actual} + G + NX$$

$$Y = C + (I^P + I^U) + G + NX$$

- $Y - AE = I^U \rightarrow$ “Unintended change in inventories”

How to understand I^U - an example

- There are two firms on an island, assume $G = 0$, $NX = 0$. In 2024:
- Firm A produced \$400 worth of apple juice. It stored \$20 into inventory as planned, and sold \$300 to Consumers. The rest also ended up into its inventory.
- Firm B produced \$200 worth of machines. But Firm A wanted \$250 worth of machines. So Firm B sold all of them along with \$50 worth of machines from its inventory to Firm A.

$$Y = \$400 + \$200 = \$600$$

$$C = \$300, I^P = \$20 + \$250 = \$270$$

$$AE = C + I^P + G + NX = \$300 + \$270 + \$0 + \$0 = \$570$$

$$I^U = +\$80 - \$50 = \$30 = Y - AE$$

- $I^U > 0 \Rightarrow$ the amount of goods produced by firms is larger than the amount sold
 \Rightarrow the unsold part goes into warehouses (unplanned inventory accumulation)
 \Rightarrow the firms will produce less next period ($Y_{t+1} \downarrow$, $u_{t+1} \uparrow$)

How is C determined?

$$C = C(Y) = C_0 + MPC \times \text{Disposable Income}$$

- C_0 : autonomous consumption (necessities for basic living)
- MPC : marginal propensity to consume.
- **Q**: What factors can affect MPC ?

Equilibrium

- The economy is at equilibrium when **Actual Output** and **Aggregate Expenditure** coincide
- $Y = AE \Leftrightarrow$ All that was produced got sold
 $\Leftrightarrow I^A = I^P \Leftrightarrow$ Unintended change in inventory = 0
- Mathematically, we need to solve the equation

$$Y = C(Y) + I^P + G + NX$$

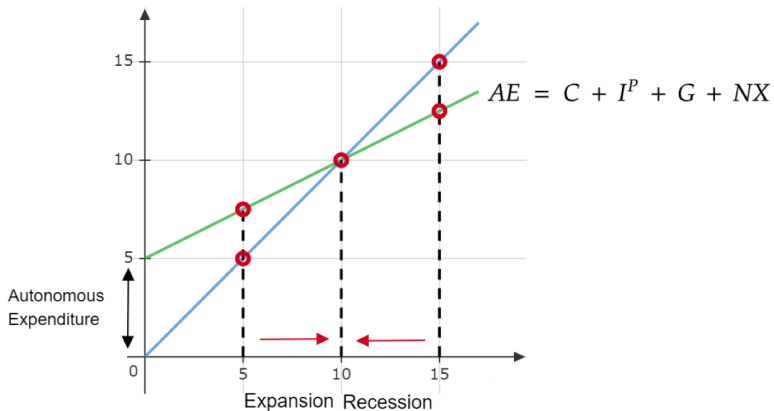
Note: Y on the LHS should be interpreted as actual output. Y on the RHS can be interpreted as total income. The numbers are the same but the meanings are different.

- Question 3 (d)

$$Y^* = \frac{1}{1 - MPC} [C_0 + I_0 + G_0 + X_0 - M_0]$$

The Keynesian Cross

Q: What are the assumptions behind the AE model?



The Multiplier Effect

$$Y^* = \frac{1}{1 - MPC} [C_0 + I_0 + G_0 + X_0 - M_0]$$

- How much increase in the equilibrium output Y^* is induced by \$1 more government spending in the economy?
- Intuitively, the \$1 increase in G , once spent, becomes the income of people in the economy. Then the person who gets that \$1 would spend a MPC fraction of it, which becomes income of the another person in the economy, again. Then a MPC fraction of that income will be spent, which is MPC^2 . This chain of the effect will continue "forever". The total effect can be summarized by an infinite sum of the following geometric sequence.

$$1 + MPC + MPC^2 + MPC^3 \dots = \frac{1}{1 - MPC}$$