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 (unplaned 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

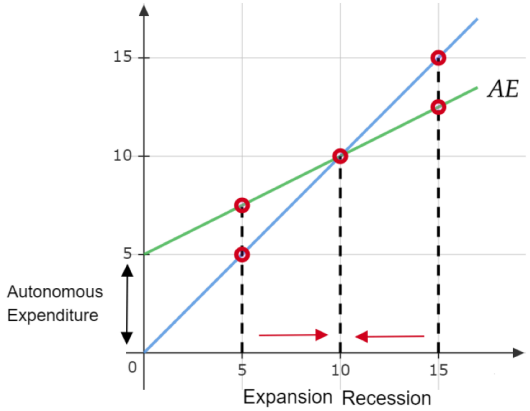
$$Y = C(Y) + I^P + G + NX$$

  Note: Y on the LHS should be interpretted as actual output. Y on the RHS can be interpretted as total income. The numbers are the same but the meanings are different.
- Question 3 (d)

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

The Keyesian Cross

Q: What are the assumptions behind the AE model?



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

The Multiplier Effect

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

- 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.

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