Lecture 8

- Introduction to the IS-LM-BP model
- The Keynesian income model
- A numerical example
- The multiplier effect
The Keynesian Income Model

- **Keynesian cross approach:**
  - Identity: \( Y = AE = C + I + G + X - M \) (Diagram)
  - All parts of \( AE \) are functions of \( Y \) \( \Rightarrow Y_e \)
    - Disposable income: \( Y_d = Y - T = C + S \), \( T = tY \)
    - \( C = a + bY_d \) and \( S = -a + (1 - b)Y_d \)
      - \( a = \) autonomous consumption spending, \( b = \) MPC
    - \( I = \bar{I}, \ G = \bar{G}, \ X = \bar{X} \) (Autonomous \( I, G, X \))
    - \( M = \bar{M} \) (autonomous imports) + \( mY \) (induced imports)
      - \( m = \frac{\Delta M}{\Delta Y}, \frac{APM}{APM}, \frac{YEM}{YEM} = \frac{MPM}{APM} \)

- **Leakages and injections approach:**
  - Leakages (money leaving the spending stream): \( S, T, M \)
  - Injections (money entering the spending stream): \( I, G, X \)
  - Equilibrium: \( S + T + M = I + G + X \) (Diagram)
C/A and National Income

- C/A can be summarized as $(X - M)$, including goods and services (C/A in deficit if $X < M$)

- Basic macroeconomic identity:
  \[ Y = AE = C + I + G + (X - M) \] (nation)
  \[ Y = C + S + T \] (household)

- Understanding the C/A balance
  \[ (X - M) = Y - (C + I + G) \] (income - spending)
  \[ (X - M) = (S - I) + (T - G) \] (private+public saving)

  $\Rightarrow$ C/A deficit implies the nation is in debt
  $\Rightarrow$ K/A must be in surplus as capital inflow > outflow to finance debt
A Numerical Example

Assumptions:
Induced: \( C = 100 + 0.8 \ Y_d, \ Y_d = Y - T, \ T = 0.25 \ Y, \ M = 20 + 0.1Y, \)
Autonomous: \( I = 180, \ G = 600, \ X = 140 \)

Keynesian cross approach:
- \( C = 100 + 0.8(Y - 0.25Y) = 100 + 0.6Y \)
- \( AE = C + I + G + X - M = 100+0.6Y+180+600+140-(20+0.1Y) \)
- \( AE = 1000 + 0.5Y = Y \Rightarrow \ Y_e = 2000 \)

Leakages and injections approach:
- \( S + T + M = Y-0.25Y-(100+0.6Y)+0.25Y+(20+0.1Y) = -80+0.5Y \)
- \( I + G + X = 180 + 600 + 140 = 920 \)
- \( S + T + M = I + G + X \Rightarrow - 80 + 0.5Y = 920 \Rightarrow \ Y_e = 2000 \)

Current account:
- \( X - M = 140 - (20 + 0.1 \times 2000) = - 80 \)
The Multiplier Effect

- **Autonomous spending multiplier:**
  - Why multiplied?
    The spending stream: \( I \uparrow \rightarrow Y \uparrow \rightarrow C, M \uparrow \rightarrow Y \uparrow \)
  - Definition:
    The multiplier gives the change of equilibrium income as autonomous spending on \( C, I, G, \) or \( X \) is changed, which is \( \Delta Y/\Delta AE_{\text{autonomous}} \)

- **Open-Economy multiplier \((k_0)\):**
  \[
  Y = (a + b(1-t) Y) + I + G + X - (M + mY) = a + (b(1-t) - m)Y + I + G + X - M \]
  \[
  \Rightarrow (1 - b(1-t) + m)Y = a + I + G + X - M \]
  \[
  \Rightarrow k_0 = \Delta Y/\Delta AE_{\text{autonomous}} = 1/ (1 - MPC(1-t) + MPM) \]

- **Foreign repercussions:**
  \( I \uparrow \rightarrow Y \uparrow \rightarrow M \uparrow \rightarrow X^* \uparrow \rightarrow Y^* \uparrow \rightarrow M^* \uparrow \rightarrow X \uparrow \rightarrow Y \uparrow \)