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
    - $I = \overline{I}$, $G = \overline{G}$, $X = \overline{X}$ (Autonomous I, G, X)
    - $M = \overline{M}$ (autonomous imports) + mY (induced imports)
      - $m = MPM = \Delta M / \Delta Y$, $APM = M/Y$, $YEM = MPM/APM$
- 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:
  - $X - M = 140 - (20 + 0.1 * 2000) = -80$

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 $\Delta Y/\Delta AE_{autonomous}$
- Open-Economy multiplier (k_0):

$$Y = (a + b(1-t)\,Y) + I + G + X - (M + mY)$$
$$= a + (b(1-t) - m)Y + I + G + X - M$$
$$\Rightarrow (1 - b(1-t) + m)Y = a + I + G + X - M$$
$$\Rightarrow k_0 = \Delta Y/\Delta AE_{autonomous} = 1/\,(1 - MPC(1-t) + MPM)$$

- Foreign repercussions:

$$I\uparrow\rightarrow Y\uparrow\rightarrow M\uparrow\rightarrow X^*\uparrow\rightarrow Y^*\uparrow\rightarrow M^*\uparrow\rightarrow X\uparrow\rightarrow Y\uparrow$$