

Chapter 12 Equations

Real side

$$(11.1) \quad Y = AD$$

$$(11.2) \quad AD = C + I + G + X - IM$$

$$(11.3) \quad C = \bar{C} + c(Y - T)$$

$$T = \bar{T}$$

$$(12.1) \quad I = \bar{I} - bi$$

Investment depends on interest rate

$$(11.4') \quad IM = \bar{IM} + mY - n\bar{q}$$

Real exchange rate fixed

$$(11.11) \quad X = \bar{X} + v\bar{q}$$

$$G = \bar{G}$$

$$(11.5) \quad Y = AD = \bar{C} + c(Y - \bar{T}) + \bar{I} - bi + \bar{G} + (\bar{X} + v\bar{q}) - (\bar{IM} - n\bar{q} + mY)$$

$$(12.2) \quad Y = \bar{\alpha}[\bar{A} + \bar{X} - \bar{IM} + (n + v)\bar{q} - bi] \quad \text{<IS curve>}$$

where $\bar{\alpha} = \left(\frac{1}{1 - c + m} \right)$, $\bar{A} \equiv \bar{C} - c\bar{T} + \bar{I} + \bar{G}$

Financial side

$$(12.3) \quad \frac{M^d}{P} = \frac{M^s}{P}$$

Equilibrium

$$(12.4) \quad \frac{M^s}{P} = \frac{\bar{M}}{\bar{P}}$$

Exogenous money supply

$$(12.5) \quad \frac{M^d}{P} = kY - hi$$

Money demand

$$kY - hi = \frac{\bar{M}}{\bar{P}}$$

$$-hi = \frac{\bar{M}}{\bar{P}} - kY$$

$$(12.6) \quad i = - \left(\frac{1}{h} \right) \left(\frac{\bar{M}}{\bar{P}} \right) + \left(\frac{k}{h} \right) Y \quad \text{<LM curve>}$$

Equilibrium: Substitute (12.6) into (12.2):

$$(12.2) \quad Y = \bar{\alpha}[\bar{A} + \bar{X} - \bar{IM} + (n + v)\bar{q} - b \left(- \left(\frac{1}{h} \right) \left(\frac{\bar{M}}{\bar{P}} \right) + \left(\frac{k}{h} \right) Y \right)]$$

$$Y(1 - c + m) = [\bar{A} + \bar{X} - \bar{IM} + (n + v)\bar{q} - b \left(- \left(\frac{1}{h} \right) \left(\frac{\bar{M}}{\bar{P}} \right) + \left(\frac{k}{h} \right) Y \right)]$$

$$Y(1 - c + m + bk/h) = [\bar{A} + \bar{X} - \bar{IM} + (n + v)\bar{q} + \left(\frac{b}{h} \right) \left(\frac{\bar{M}}{\bar{P}} \right)]$$

$$(12.7) \quad Y_0 = \hat{\alpha}[\bar{A} + \bar{X} - \bar{IM} + (n + v)\bar{q} + \left(\frac{b}{h} \right) \left(\frac{\bar{M}}{\bar{P}} \right)] \quad \text{where } \hat{\alpha} \equiv \left(\frac{1}{1 - c + m + \frac{bk}{h}} \right)$$

Policy: Take the total differential

$$(12.8) \quad \Delta Y = \hat{\alpha}[\Delta A + \Delta X - \Delta IM + (n + v)\Delta q + \left(\frac{b}{h}\right) \Delta \left(\frac{M}{P}\right)]$$

Multipliers:

$$\frac{\Delta Y}{\Delta G} = \hat{\alpha} \geq 0$$

$$\frac{\Delta Y}{\Delta(M/P)} = \hat{\alpha}(b/h) \geq 0$$

$$\frac{\Delta Y}{\Delta q} = \hat{\alpha}(n + v) \geq 0$$

External balance

$$(12.9) \quad CA + FA + ORT \equiv 0$$

$$(12.10) \quad TB + FA = 0$$

$$(12.11) \quad FA = \overline{FA} + \kappa(i - \bar{i}^*)$$

$$[\bar{X} + v\bar{q} - \overline{IM} + n\bar{q} - mY] + [\overline{FA} + \kappa(i - \bar{i}^*)] = 0$$

$$(\bar{X} - \overline{IM} + \overline{FA}) + (n + v)\bar{q} - mY + \kappa i - \kappa \bar{i}^* = 0$$

$$(12.12) \quad i = -\left(\frac{1}{\kappa}\right) [(\bar{X} - \overline{IM} + \overline{FA}) + (n + v)\bar{q}] + \bar{i}^* + \left(\frac{m}{\kappa}\right) Y \quad \text{<BP=0 curve>}$$

Central Bank
Balance Sheet

Assets	Liabilities
Domestic Assets (DA)	Currency (CU)
Foreign exchange reserves (FXRes)	Bank reserves (Res)