Macroeconomic Model (Cont1)

3: Floating Exchange Rate and Perfect Capital Mobility

Floating Exchange Rate and Perfect Capital Mobility

- The model works under an assumption where economic agents are risk neutral, i.e. risk is bad and can be compensated by return.

- Under the perfect capital mobility, uncovered interest parity holds. Exchange rate expectation will be incorporated into the model.

$$R = \frac{\left(1+R^{*}\right)S_{+1}^{e}}{S} - 1 \quad \text{----UIP}$$

- What is the central bank's policy target

  Under Fixed Exchange Rate: exchange rate and others such as domestic credit, interest rate, and monetary targeting

  Under Floating Exchange Rate

$$SF_C^* + B_C = M$$

- In this model, exchange rate expectation is needed.

- We assume that agents are rationale. That is, they have economic model in their mind to forecast key macroeconomic variables (output, interest rate, exchange rate), using all available information. This is to form expected exchange rate.

- Assume that shocks are transitory, i.e. the effect lasted long for 1 period.

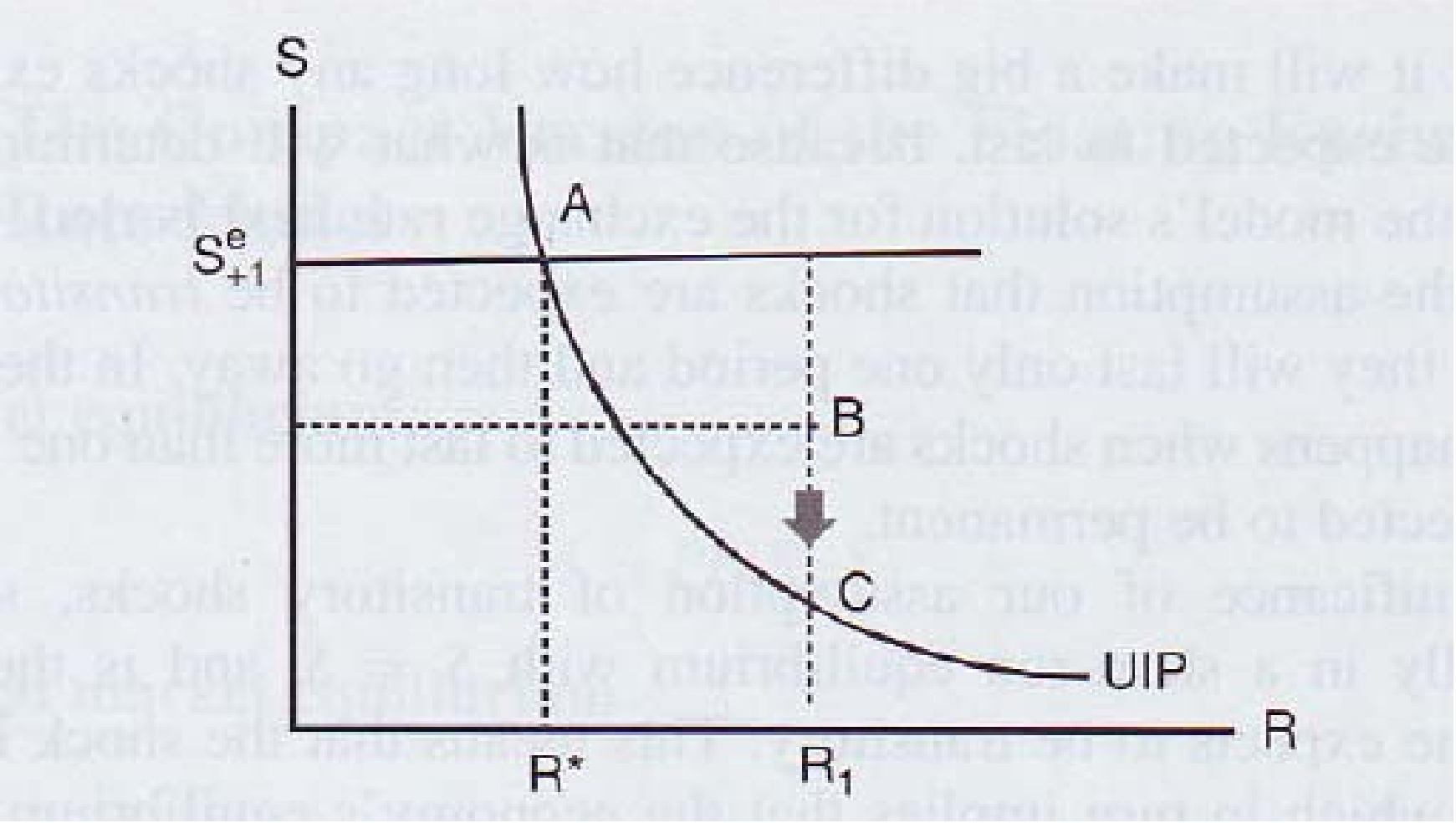
Relationship between exchange rate and domestic interest rate

$$R = \frac{\left(1 + R^{*}\right) S^{e}_{+1}}{S} - 1$$

$$S = \frac{\left(1 + R^{*}\right) S^{e}_{+1}}{\left(1 + R\right)}$$

$$\frac{\partial S}{\partial R} = -\frac{\left(1 + R^{*}\right) S^{e}_{+1}}{\left(1 + R\right)^{2}}; \qquad \frac{\partial^{2} S}{\partial R^{2}} = \frac{2\left(1 + R^{*}\right) S^{e}_{+1}}{\left(1 + R\right)^{3}}$$

UIP (Interest rate and exchange rate)



- In the model setting, the relationship between exchange rate and domestic interest rate is negative and convex, given expected exchange rate and world interest rate.

- Since our main focus is on exchange rate, we can replace domestic interest rate variable used in the two previous cases (fixed exchange rate and perfect capital mobility; fixed but adjustable exchange rate and imperfect capital mobility) by exchange rate.

- Derivative on UIP above illustrates the negative and convex relationship between domestic interest rate and exchange rate.

- When expected exchange rate equals to actual exchange rate, domestic interest rate must be identical to world interest rate.

- Points on UIP curve indicate equilibrium in the capital market (No incentive to rellocate capitals).

- According to UIP, an increase in domestic interest rate causes currency appreciate.

- Any points above the UIP indicates that there would be capital inflows. Currency appreciation would be expected.

$$R > \frac{\left(1+R^{*}\right)S_{+1}^{e}}{S} - 1$$

- Any points below UIP indicates that there would be capital outflows. Currency depreciation would be expected.

$$R < \frac{\left(1+R^{*}\right)S^{e}_{+1}}{S} - 1$$

General Equilibrium

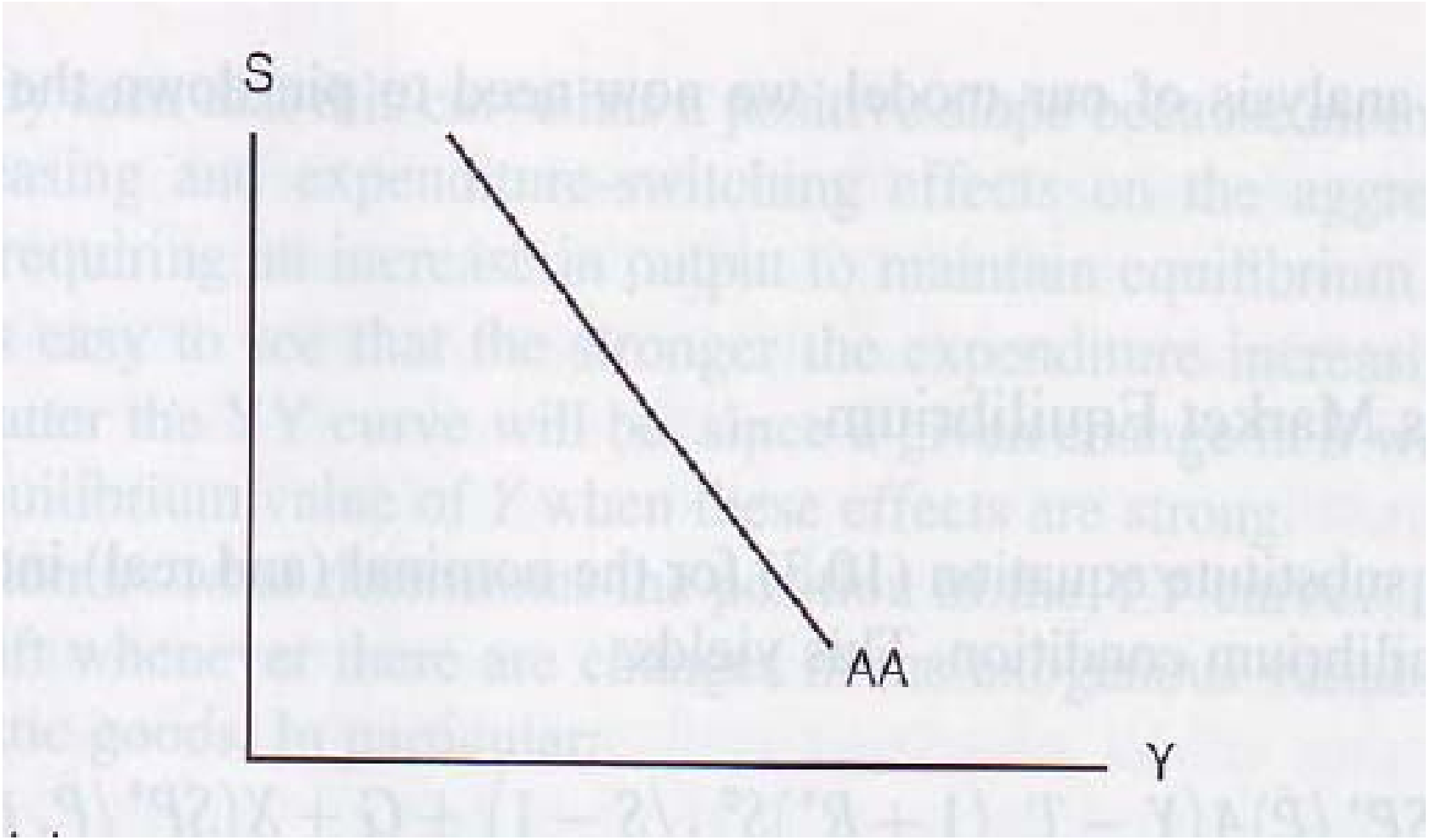
- In the floating exchange rate system, exchange rate becomes a policy focus. Hence, the interested diagram would be the relationship between exchange rate and output.

- Under the perfect capital mobility, money equilibrium and UIP can be merged to represent the role of exchange rate in the economy.

$$M = PL\left(R, Y\right) - - - MM$$

$$R = \frac{\left(1 + R^{*}\right) S_{+1}^{e}}{S} - 1 - - - UIP$$

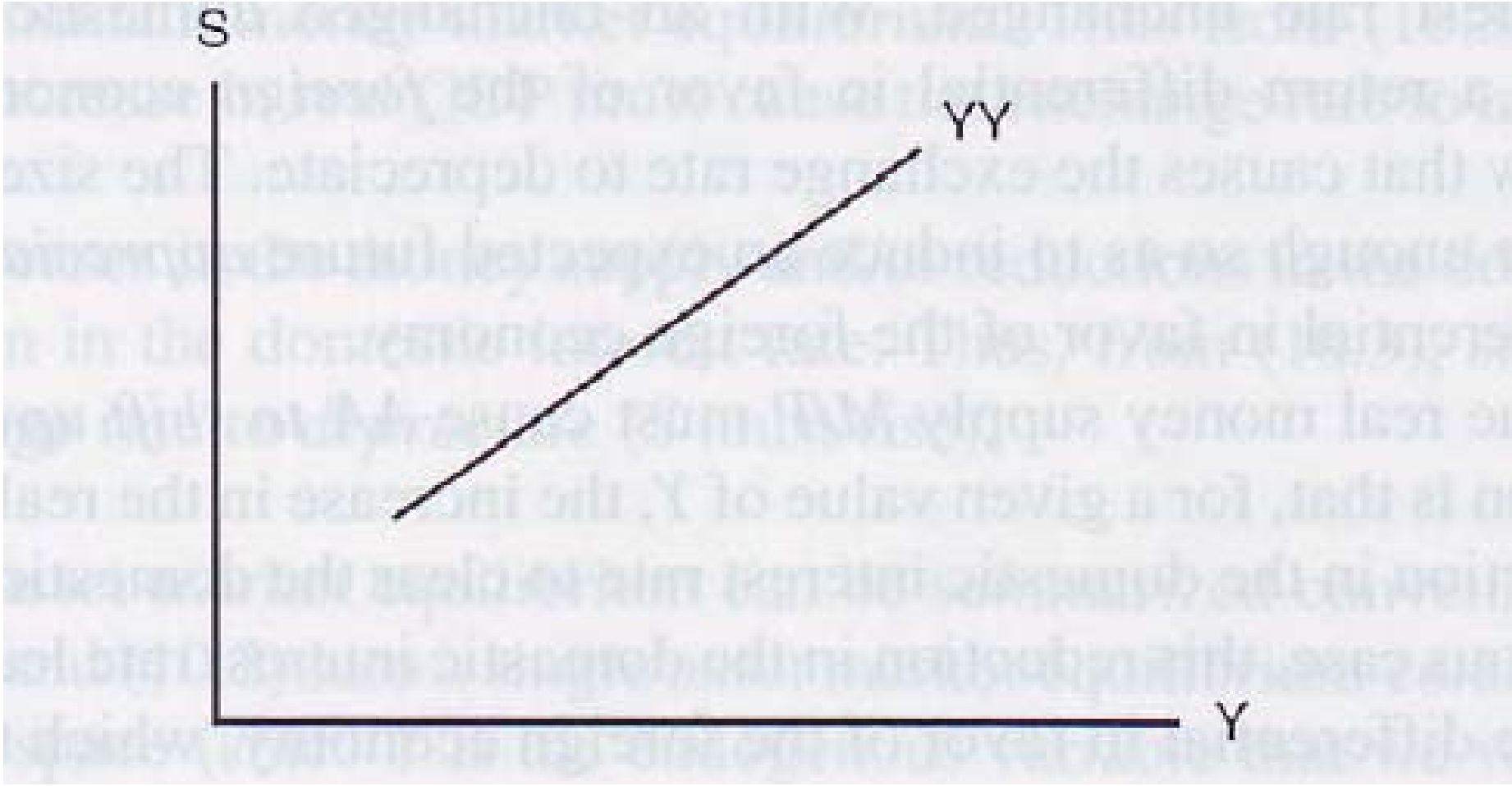
$$M = PL\left[\frac{\left(1 + R^{*}\right) S_{+1}^{e}}{S} - 1, Y\right] - - - UIP + MM$$


S
AA
Y

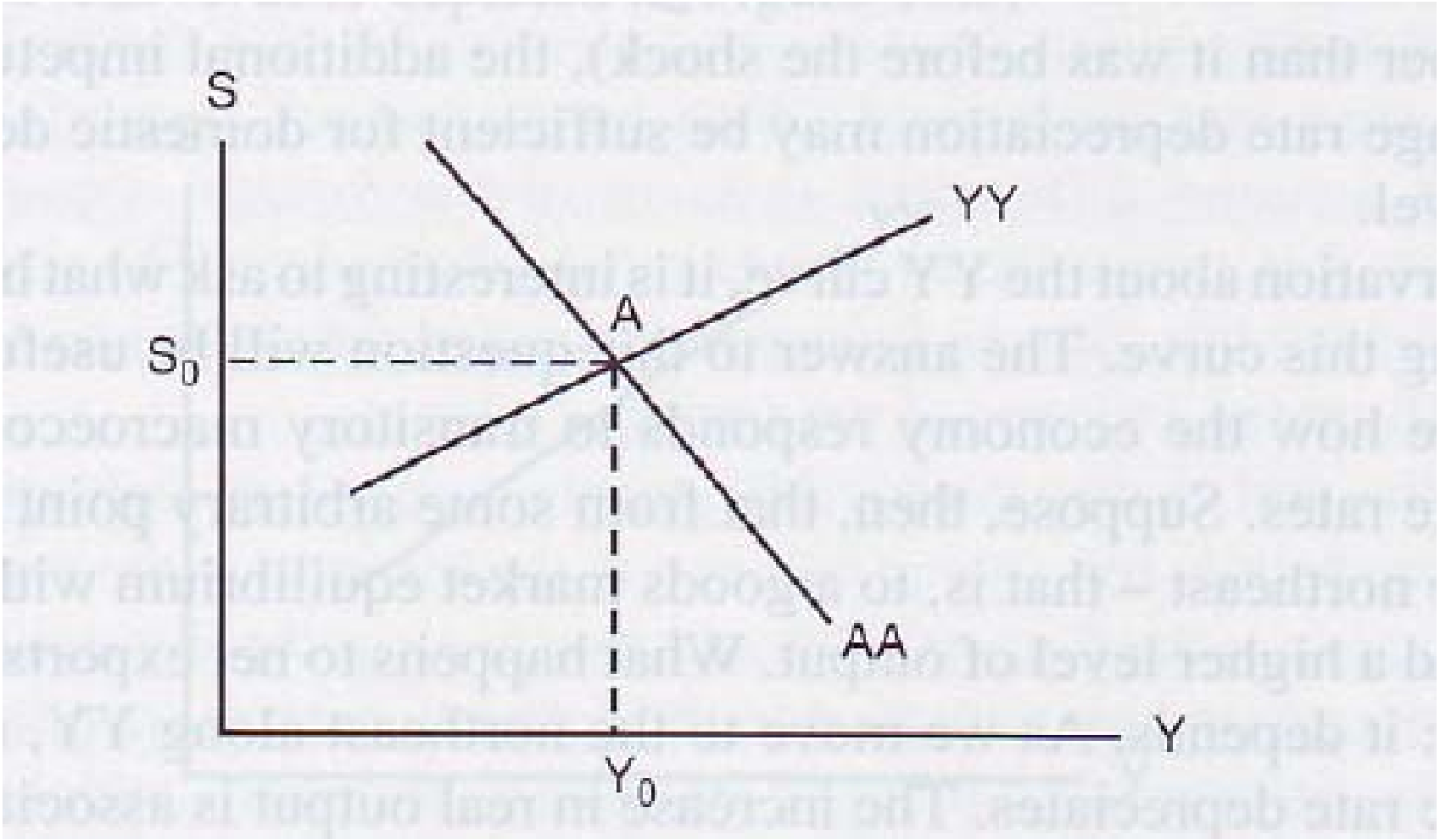
Good Market Equilibrium on S and Y

$$Y = \varphi\left(\frac{SP^*}{P}\right) A\left(Y - T, \left(1 + R^*\right)\frac{S^e_{+1}}{S} - 1\right) + G + X\left(\frac{SP^*}{P}, \theta\right)$$

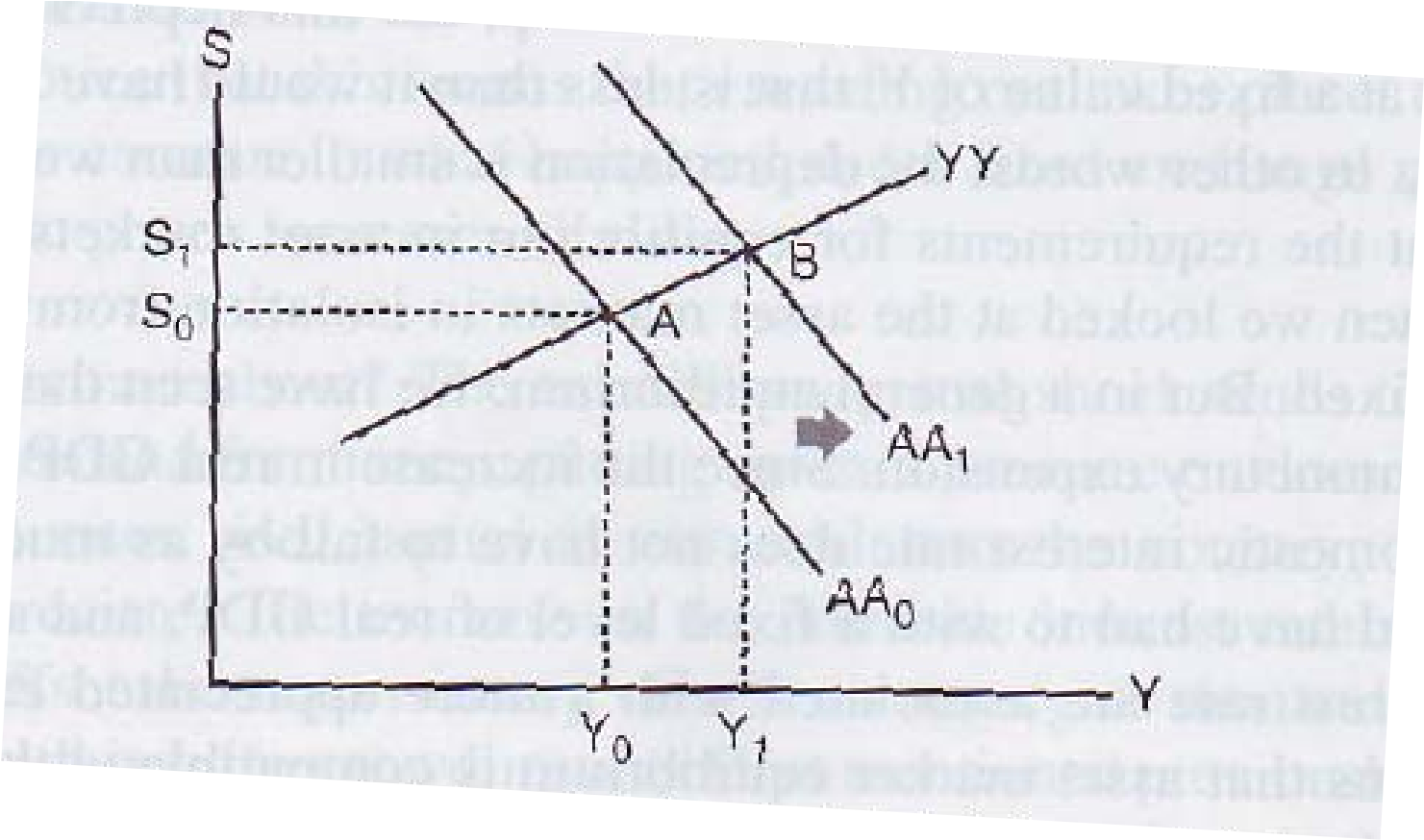
- Note that currency depreciation (an increase in S) generates two effects;
  - Expenditure Increasing Effect
  - Expenditure Switching Effect


S
YY
Y

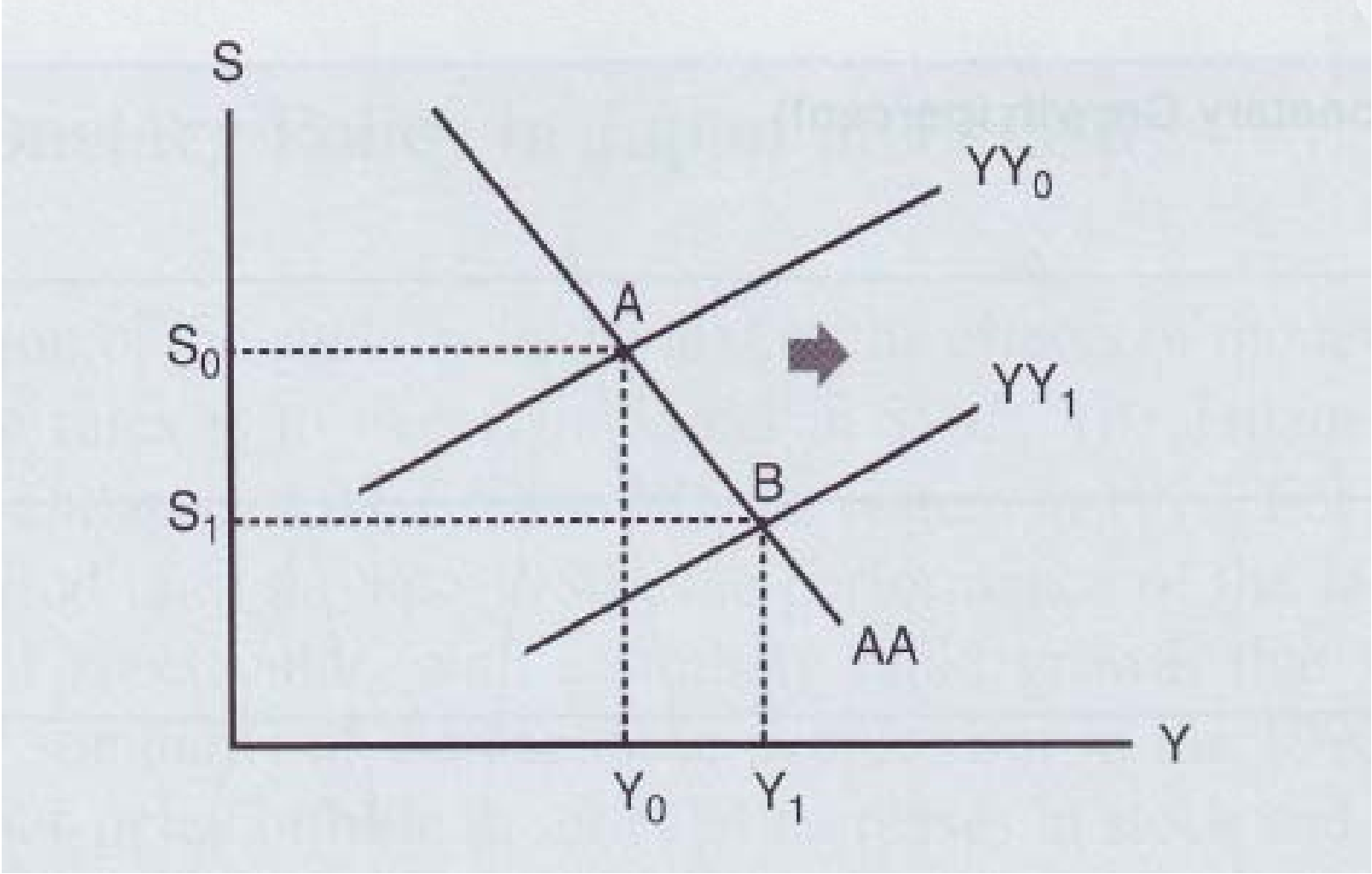
General Equilibrium



Monetary Expansion



Fiscal Expansion



External Financial Shocks