

**CHAPTER – 6**  
**OPEN ECONOMY MACROECONOMICS**  
**EXERCISES**

**Question 1:** Differentiate between balance of trade and current account balance.

Answer:

Main points of difference between balance of trade and current account balance are –

- 1) Balance of trade is the difference between export and import of visible goods only whereas current account balance is the difference between export and import of goods as well as services.
- 2) Current account balance is a wider term; it includes balance of trade.
- 3) Balance of trade includes only visible items whereas current account balance includes invisibles also.

**Question 2:** What are official reserve transactions? Explain their importance in the balance of payments.

Answer:

The transaction carried by Monetary Authority of a country which causes change in official reserves is called official reserve transaction. It includes purchase or sale of currency in exchange market for foreign currencies or other assets. The reserves are drawn by selling foreign currencies in exchange market during deficit and foreign currencies are purchased during surplus. When the official reserves increase or decrease it is called overall balance of payment surplus or deficit respectively.

The importance of official reserve transactions in balance of payment is –

- a) Purchase of own currency by a country is a credit item in the balance of payments and vice versa.
- b) It helps to adjust the deficit or surplus in balance of payments.

**Question 3:** Distinguish between the nominal exchange rate and the real exchange rate. If you were to decide whether to buy domestic goods or foreign goods, which rate would be more relevant? Explain.

Answer:

Nominal exchange rate is the price of foreign currency in relation to domestic currency. Suppose we say 1 USD equals to 66 INR it means 66 Indian rupees are required to buy one US dollar and this is nominal exchange rate

Real exchange rate is the price of foreign goods in terms of domestic goods. Now suppose we are buying 1 kg of potato for 2 US dollars and converting it into Indian rupees it will be  $2 \times 66$ , whereas the price of potatoes in India is Rs 10 per kg, this will be the real exchange rate.

$$\text{Real Exchange Rate} = e (P_f / P)$$

Where –

$e$  = Nominal Exchange Rate

$P_f$  = Price level of foreign currency

$P$  = Price level of domestic currency

For given example of potatoes the real exchange rate will be –

$$= 66 (2 / 10)$$

$$= 13.2$$

It means you can buy 13.2 kgs of potatoes in India for the price that you will pay in buying them in US. The real exchange rate is important for tourists going abroad.

If I decide to buy domestic goods or foreign goods, the real exchange rate will be more relevant than the nominal exchange rate.

**Question 4:** Suppose it takes 1.25 yen to buy a rupee, and the price level in Japan is 3 and the price level in India is 1.2. Calculate the real exchange rate between India and Japan (the price of Japanese goods in terms of Indian goods). (Hint: First find out the nominal exchange rate as a price of yen in rupees).

Answer:

$$\text{Real Exchange Rate} = e (P_f / P)$$

Where –

$$e = \text{Nominal Exchange Rate} = 1/1.25 = 0.8$$

$$P_f = \text{Price level of foreign currency} = 3$$

$$P = \text{Price level of domestic currency} = 1.2$$

For given example of potatoes the real exchange rate will be –

$$= 0.8 (3 / 1.20)$$

$$= 2$$

**Question 5:** Explain the automatic mechanism by which BOP equilibrium was achieved under the gold standard.

Answer:

Under Gold Standard System gold was taken as a common unit to measure the currencies of other countries, which means the value of every currency was defined in terms of gold.

The exchange rate in open market was determined by its worth in terms of the value of gold. However, the upper and lower limits were fixed within which it fluctuated.

Under Gold Standard System the exchange rates became stable and all countries maintained a proper stock of gold so as to exchange currency.

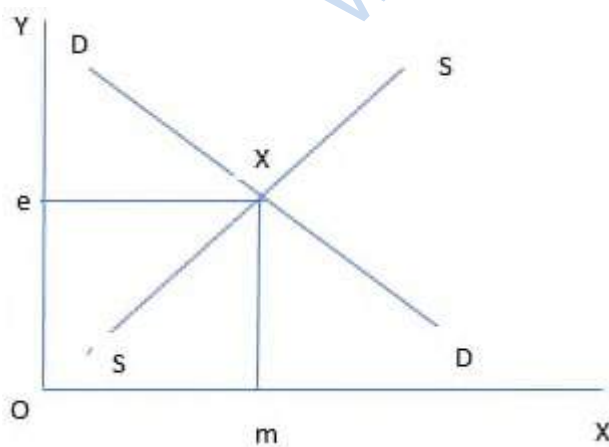
**Question 6:** How is the exchange rate determined under a flexible exchange rate regime?

Answer:

Under flexible or floating exchange rate regime, the exchange rate is determined by the interaction of market forces of demand and supply of foreign exchange in international market.

Central Bank does not intervene in foreign exchange market in deciding the exchange rate system.

Let us explain it with help of the following diagram



In the above diagram –

- OX represents the Amount of Foreign Exchange
- OY represents the Exchange Rate
- DD is the downward sloping demand curve for foreign exchange
- SS denotes the upward sloping supply curve of foreign exchange
- X is the equilibrium point where demand and supply of foreign exchange are equal
- Oe denotes the equilibrium exchange rate
- Om denotes the equilibrium amount of foreign exchange

**Question 7:** Differentiate between devaluation and depreciation.

Answer:

| <b>Devaluation</b>   | <b>Depreciation</b>   |
|--|---|
| Devaluation refers to the fall in the value of domestic currency in relation to a foreign currency as planned by the government.<br><br>In devaluation it is government which reduces the value of domestic currency in terms of the foreign currency. | Depreciation is the fall in the value of domestic currency in relation to a foreign currency, it is the free play of the forces of demand and supply of foreign exchange in foreign exchange market the government has no role in it. |
| Devaluation is a desired fall in the value of a rupee.   | Depreciation may cause undesired fall.  |
| The objective of devaluation is to promote export and to curb import.  | Depreciation may result in current account deficit and fiscal deficit.  |

**Question 8:** Would the central bank need to intervene in a managed floating system? Explain why.

Answer:

Under a managed floating rate system, the central bank intervenes by entering the market as a bulk buyer or seller. When the floating rate is too high central bank starts selling foreign exchange from its reserve to bring the rate down. When rate is too low it starts buying foreign exchange so as to raise the rate. This is done in the interest of importers and exporters.

Thus the central bank intervention is an attempt to moderate exchange rate movement.

**Question 9:** Are the concepts of demand for domestic goods and domestic demand for goods the same?

Answer:

No, the concepts of demand for domestic goods and domestic demand for goods are not same.

Demand for domestic goods means the demand for goods by domestic and foreign consumers.

However domestic demand for goods is the demand for goods produced domestically as well as abroad.

Demand for domestic goods =  $C + I + G + X - M$  = Domestic demand for goods +  $X - M$

Domestic demand for goods =  $C + I + G$

Therefore, demand for domestic goods is a wider term than domestic demand for goods and includes it.

**Question 10:** What is the marginal propensity to import when  $M = 60 + 0.06Y$ ? What is the relationship between the marginal propensity to import and the aggregate demand function?

Answer:

Marginal propensity to import is the change in import induced by change in income of the country. It is the degree to which country changes its import in relation to change in GDP.

Given –

$$M = 60 + 0.06Y$$

It means marginal propensity to import is 0.06 which reflects that with 1 Rupee increase in income the import will increase with 0.06.

The marginal propensity to import affects the aggregate demand function negatively. With increase in income the aggregate demand decreases because additional income is spent on foreign goods and not on domestic products.

**Question 11:** Why is the open economy autonomous expenditure multiplier smaller than the closed economy one?

Answer:

In a closed economy, the Equilibrium Level of Income (Y) is given by –

$$Y = C + cY + I + G$$

$$\text{Or, } Y - cY = C + I + G$$

$$\text{Or, } Y(1 - c) = C + I + G$$

$$\text{Therefore, } Y = C + I + G / 1 - c$$

$$\text{Let, } C + I + G = A_1$$

$$Y = A_1 / 1 - c$$

$$\Delta Y / \Delta A_1 = 1 / 1 - c \text{ (eq 1)}$$

In an open economy, the Equilibrium Level of Income (Y) is given by –

$$Y = C + cY + I + G + X - M - mY$$

$$\text{Or, } Y - cY + mY = C + I + G + X - M$$

$$\text{Or, } Y(1 - c + m) = C + I + G + X - M$$

$$\text{Or, } Y = (C + I + G + X - M) / 1 - c + m$$

Let autonomous expenditure ( $A_2$ ) =  $C + I + G + X - M$

$$\text{Or, } Y = A_2 / 1 - c + m$$

$$\Delta Y / \Delta A_2 = 1 / 1 - c + m \text{ (eq 2)}$$

Comparing Equation 1 and 2, we can conclude that multipliers in open economy is smaller than the multiplier in closed economy because the denominator in open economy is greater than the denominator in closed economy.

**Question 12:** Calculate the open economy multiplier with proportional taxes,  $T = tY$ , instead of lump-sum taxes as assumed in the text.

Answer:

The open economy multiplier with proportional taxes will be

$$Y = C + c(1 - t)Y + I + G + X - M - mY$$

$$Y - c(1 - t)Y + mY = C + I + G + X - M$$

$$Y[1 - c(1 - t) + m] = C + I + G + X - M$$

$$Y = C + I + G + X - M / 1 - c(1 - t) + m$$

Autonomous expenditure ( $A$ ) =  $C + I + G + X - M$ . Therefore, open economy multiplier with proportional taxes will be –

$$Y = A / 1 - c(1 - t) + m$$

$$\Delta Y / \Delta A = 1 / 1 - c(1 - t) + m$$



**Question 13:** Suppose  $C = 40 + 0.8Y$ ,  $T = 50$ ,  $I = 60$ ,  $G = 40$ ,  $X = 90$ ,  $M = 50 + 0.05Y$  (a) Find equilibrium income. (b) Find the net export balance at equilibrium income (c) What happens to equilibrium income and the net export balance when the government purchases increase from 40 and 50?

Answer:

Given

$$C = 40 + 0.8Y$$

$$T = 50$$

$$I = 60$$

$$G = 40$$

$$X = 90$$

$$M = 50 + 0.05Y$$

$$\text{Equilibrium Income (Y)} = A / 1 - c + m$$

$$A = C - cT + I + G + X - M$$

$$Y = C - cT + I + G + X - M / 1 - c + m$$

$$= 40 - (0.8 \times 50) + 60 + 40 + 90 - 50 / 1 - 0.8 + 0.05$$

$$= 560$$

Net exports at equilibrium income

$$NX = X - M - mY$$

$$= 90 - 50 - (0.05 \times 560)$$

$$= 12$$

When  $G$  increase from 40 to 50, Equilibrium income (Y)

$$Y = C - cT + I + G + X - M / 1 - c + m$$

$$= 40 - (0.8 \times 50) + 60 + 50 + 90 - 50 / 1 - 0.8 + 0.05$$

$$= 600$$

Net export balance at equilibrium income

$$NX = X - (M + mY)$$

$$= 90 - 50 - 0.05 \times 600$$

$$= 10$$

**Question 14:** In the above example, if exports change to  $X = 100$ , find the change in equilibrium income and the net export balance.

Answer:

Given –

$$C = 40 + 0.8 YD$$

$$T = 50$$

$$I = 60$$

$$G = 40$$

$$X = 100$$

$$M = 50 + 0.05Y$$

$$\text{Equilibrium Income (Y)} = A / 1 - c + m$$

$$A = C - cT + I + G + X - M$$

$$Y = C - cT + I + G + X - M / 1 - c + m$$

$$= 40 - (0.8 \times 50) + 60 + 40 + 100 - 50 / 1 - 0.8 + 0.05$$

$$= 190 - 40 / 0.25$$

$$= 150 / 0.25$$

$$= 600$$

$$\text{Net export balance } NX = X - M - 0.05Y$$

$$= 100 - 50 - (0.05 \times 600)$$

$$= 20$$

**Question 15:** Explain why  $G - T = (S^p - I) - (X - M)$ .

Answer:

In a closed economy the savings and investments are equal at equilibrium level of income whereas in an open economy the savings and investments differ.

$$Y = C + I + G + X - M$$

$$NX = NX = X - M$$

$$\text{Or, } Y = C + I + G + NX$$

$$\text{Or, } Y - C - G = I + NX \dots\dots (1)$$

$Y - C - G$  can be regarded as national savings (S) or the net national income after all consumption and government spending.

So, we can write -

$$Y - C - G = S$$

$$\text{Or, } S = I + NX$$

$$S = \text{Private Savings } (S^p) + \text{Government Savings } (S^g)$$

Therefore,

$$S = S^p + S^g$$

$$\text{Or, } S^p + S^g = I + NX$$

$$\text{Or, } NX = S^p + S^g - I$$

$$S^p = Y - C - T$$

$$S^g = T - G$$

$$\text{So, } NX = Y - C - T + T - G - I$$

$$\text{Or, } NX = Y - C - G - I$$

$$\text{Or, } G = Y - C - I - NX$$

Subtracting T from both sides

$$\text{Or, } G - T = Y - C - I - NX - T$$

$$\text{Or, } G - T = Y - C - T - I - NX$$

$$\text{Or, } G - T = (S^p - I) - NX$$

Where,  $NX = X - M$

$$G - T = (S^p - I) - (X - M)$$

**Question 16:** If inflation is higher in country A than in Country B, and the exchange rate between the two countries is fixed, what is likely to happen to the trade balance between the two countries?

Answer:

It is given that –

- Country A has high inflation than country B
- The exchange rate is fixed

In this case there are following possibilities –

- It is advantageous for country B to export goods to country A
- It will be expensive for country A to export goods to country B where as it will be advantageous to import from country B
- So this will give rise to imports of country A and exports of country B

- It will lead to trade surplus in country A and trade deficit in country B

**Question 17:** Should a current account deficit be a cause for alarm? Explain.

Answer:

Current account deficit is the excess of imports of goods, services and transfers over total exports of goods, services and transfer. In this situation a country becomes debtor of rest of the world but every time it cannot be treated as alarming situation because the countries might be running in current account deficit to increase productivity and future exports.

However proper care should be taken for countries long run prospects if the trade deficit results in smaller saving or a larger budget deficit. The deficit could reflect higher private or government consumption. In such cases the country's capital stock will not rise rapidly to lead to enough growth required to repay its debt.

However, if the trade deficit reflects a rise in investment then it is not a serious cause to worry about because this will help in building capital stock faster and will increase future output.

**Question 18:** Suppose  $C = 100 + 0.75Y$ ,  $D, I = 500$ ,  $G = 750$ , taxes are 20 per cent of income,  $X = 150$ ,  $M = 100 + 0.2Y$ . Calculate equilibrium income, the budget deficit or surplus and the trade deficit or surplus.

Answer:

Given –

$$C = 100 + 0.75Y$$

$$c = 0.75$$

$$I = 500,$$

$$G = 750$$

$$T = 0.20Y$$

$$M = 100 + 0.2Y$$

$$m = 0.2$$

$$X = 150$$

$$\text{Equilibrium Income (Y)} = C + c(Y - T) + I + G + X - M - mY$$

$$Y = 100 + 0.75(Y - 0.20Y) + 500 + 750 + 150 - 100 - 0.2Y$$

$$Y = 1400 + 0.75(0.8Y) - 0.2Y$$

$$Y = 1400 + 0.6Y - 0.2Y$$

$$Y = 1400 + 0.4Y$$

$$0.6Y = 1400$$

$$Y = 1400/0.6 = 2333$$

$$\text{Govt Expenditure} = 750$$

$$\text{Govt Receipts (Tax)} = 2333 \times 20\% = 467$$

Govt Expenditure > Govt Receipts

It shows the government is running budget deficit.

$$NX = X - M - MY$$

$$= 150 - 100 - 0.2 \times 2333$$

$$= 150 - 100 - 467$$

$$= 150 - 567$$

$$= -417$$

**Question 19:** Discuss some of the exchange rate arrangements that countries have entered into to bring about stability in their external accounts.

Answer:

The exchange rate arrangements that the countries have entered into to bring stability in their external accounts are –

- a) Wider bands: This system allows adjustment in fixed exchange rate. Under this system only 10% variation between the currencies of any two countries is allowed.
- b) Crawling peg: The system of crawling peg allows continuous and regular adjustment in the exchange rate but it is limited up to 1% variation at one point of time.
- c) Float management: Under this scheme the government can intervene to vary the exchange rates. It is done as per the demand of situation and has no limit as above two.