# B.A.³ᴿᴰ SEMESTER

# INTERMEDIATE MACROECONOMICS
# UNIT-3
# MUNDELL-FLEMING MODEL

# Introduction to the Model

- **Mundell- Fleming model is an extension of the IS-LM model. This model is also called IS-LM-BP model.**

**Basic Equations :**

**The Mundell–Fleming model is based on the following equations:**

- **The IS curve:**

**$Y=C(Y-T)+I(i_f)+G +NX (R)$**

**where $NX$ is net export, Y is the level of national income, $i_f$ is the world interest rate and R is the exchange rate.**

**The IS equation describes the good market equilibrium.**

- **The LM curve:**

**$M/P=L( i_f, Y)$**

**Where Y is the level of national income.**

**The LM equation describes the money market equilibrium.**

- **The BoP (Balance of Payments) Curve:  BoP=CA+KA**

**where BoP is the <u>balance of payments</u> surplus, $CA$ is the <u>current account</u> surplus, and $KA$ is the <u>capital account</u> surplus.**

# Assumptions of the Model

The model assumes-

1. A small open economy
2. Tax rates are same everywhere
3. Foreign investors do not face political risk
4. Perfect capital mobility
5. Rate of interest is determined by the world interest rate i.e. (domestic interest rate)$i$ = (world interest rate) $i_f$

# Mundell-Fleming Model of the Small Open Economy (under Fixed Exchange Rate)

Under fixed exchange rates and perfect capital mobility, a country can't move out of line with those prevailing in the world market. Any attempt at independent monetary policy leads to capital flows and need to intervene until interest rates are back in line with those in the world market.

# Effectiveness of Monetary Policy under Fixed Exchange Rate

With perfect mobility of capital, under fixed exchange rate regime, monetary policy both expansionary and contractionary in a small open economy is quite ineffective to influence the levels of national income (output) and employment.

# Expansionary Monetary Policy
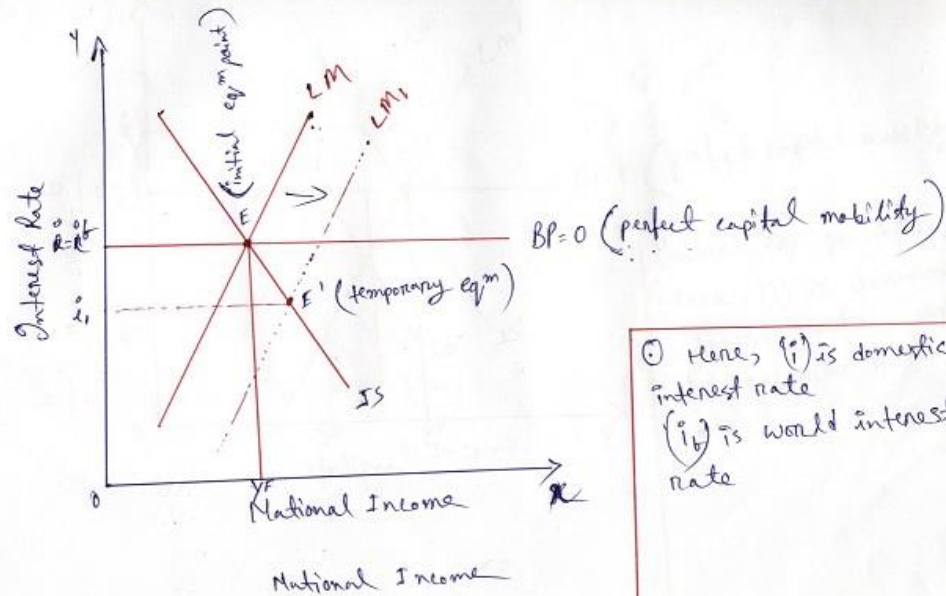
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- The effect of monetary expansion under the fixed exchange rate regime using IS-LM model is explained in the above diagram.

- IS curve is negatively sloped curve showing the negative relation between interest rate and income level.

- LM curve is positively sloped because of the positive relation between interest rate and income level.

- The horizontal straight line BP shows perfect capital mobility among the countries. The horizontal line BL= 0 at domestic interest rate i equal to foreign interest rate $i_f$ ($i = i_f$). It also shows that the country has neither deficit or surplus in its balance of payments, that is, its balance of payments is in equilibrium.

- At any other interest rate massive capital flows will occur which will cause disequilibrium in the balance of payments and will force the Central Bank to intervene to maintain the exchange rate.

# Continue

- Initially at point E, IS-LM curves intersect at E which determines domestic rate of interest i which is equal to foreign rate of interest $i_f$.

- With monetary expansion, LM curve shifts to the right and as a result the economy moves to the new equilibrium position E' where domestic rate of interest has fallen to $i_1$.

- As domestic interest falls below the world interest rate, therefore, capital outflows from the domestic country. As a result supply of foreign exchange will decline in the domestic country. Which depriciates domestic currency.

- At the new position E' economy will have a large deficit in balance of payments which will exert a pressure on the exchange rate of domestic currency to depreciate.
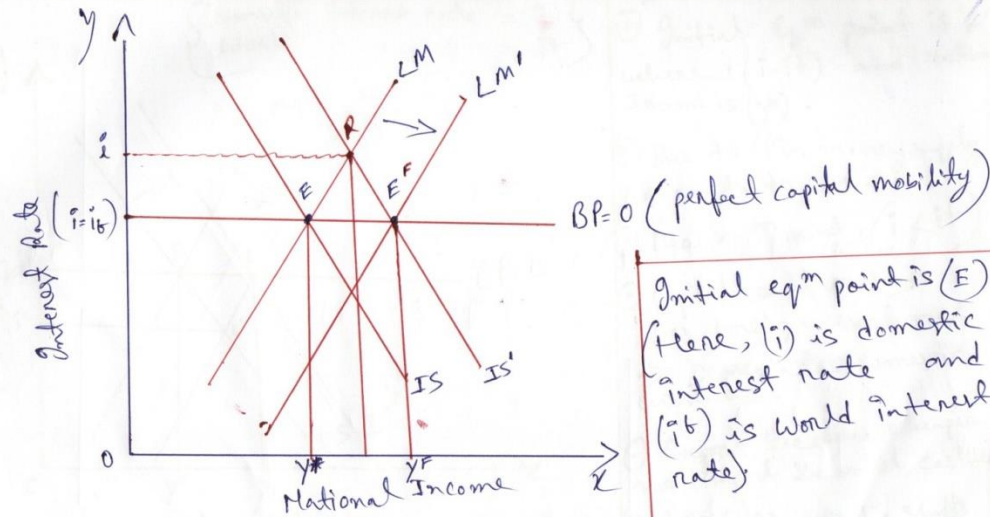
# Continue.....

- Under the fixed exchange rate, to maintain the exchange rate, the Central Bank of the country will intervene; it will sell foreign currency reserves in the foreign exchange market.

- Again the Central Bank will be forced to reduce domestic money supply and as a result LM curve shift back to its original position from LM' to LM.

- The original equilibrium position will be established again. Where, national income is Yf and interest rate is i= $i_f$.

- Therefore, under fixed exchange rate with perfect capital mobility monetary policy is ineffective to change national income.

# Expansionary Fiscal Policy

- While expansionary monetary policy under fixed rate regime is quite ineffective to affect national income and output, fiscal policy is highly effective, given the perfect mobility of capital.

- Suppose adopting expansionary fiscal policy Government increases its expenditure with money supply remaining unchanged.

# Expansionary Fiscal Policy (Fixed Exchange Rate)



$BP = 0$ (perfect capital mobility)

Initial eqm point is $(E)$
(Here, $(i)$ is domestic interest rate and $(i_b)$ is World interest rate)

# Continue…..

- The increase in government expenditure (Expansionary fiscal policy)causes shift in the IS curve to the right to the new position IS'. This raises both the domestic interest rate (i) and level of national income (output). The higher domestic rate of interest as compared to the world interest rate ($i_f$) will cause capital inflows into the economy.

- These capital inflows will bring about appreciation in exchange rate of domestic currency.

# Continue…..

- Under the fixed exchange rate, to maintain the exchange rate pegged the Central Bank will have to expand money supply which will cause a shift in LM curve to the right (i.e. to LM')and increase national income further.

- With the increased money supply the LM curve shifts to the new position LM' and domestic rate of interest falls back to the original level so that it is again equal to the world interest rate ($i = i_f$). But a new equilibrium is established at point EF. At the new equilibrium point, national income increases to YF but $i = i_f$.

- Fiscal expansion leads to increase in national income by $Y_* Y_F$, equal to the Keynesian multiplier effect.

# Continue…..

- The Central Bank under the fixed exchange rate system with perfect capital mobility cannot conduct an independent monetary policy to achieve domestic economic stability. Therefore, any monetary policy is ineffective.

- But under this condition, fiscal policy is effective to change national income.

- However, government can use expansionary fiscal policy to raise the level of national income and employment.

# Mundell-Fleming Model of the Small Open Economy (under Flexible Exchange Rate)

- Under flexible exchange rate regime, the Central Bank does not intervene in the market for foreign exchange.

- The exchange rate adjusts itself to bring the demand for and supply of foreign exchange in equilibrium. Therefore, under flexible exchange rate system and without the intervention of the Central Bank, balance of payments must always be in equilibrium, that is, there is neither any deficit nor any surplus.

- In Mundell-Fleming model the assumption of perfect capital mobility ensures that at only one interest rate which is equal to world interest rate ($i = i_f$) the balance of payments is zero, that is, in equilibrium (BP = 0).

# Expansionary Monetary Policy

# Continue…..

- Initially the economy is in equilibrium at E. where
$(i = i_{f.})$ and national income is Yo.

- Due to increase in money supply, LM shifts to LM' and a new equilibrium is established at E' where, $(i < i_{f.})$ . As a result capital outflows from the domestic country causing reduction in the stock of foreign exchange. Which depreciates the domestic currency.

- With the depreciation of domestic currency, export becomes cheaper and import becomes costlier and as a result net export increases.

- With the increase in net export, IS curve shifts towards right to IS' and a new equilibrium E'' is established.

- At E'', domestic interest rate (i) becomes equal to world interest rate ( $i_f$ ) but national income increases to Y1.

# Expansionary Fiscal Policy



Effect of Expansionary Fiscal Policy
(Flexible Exchange Rate)
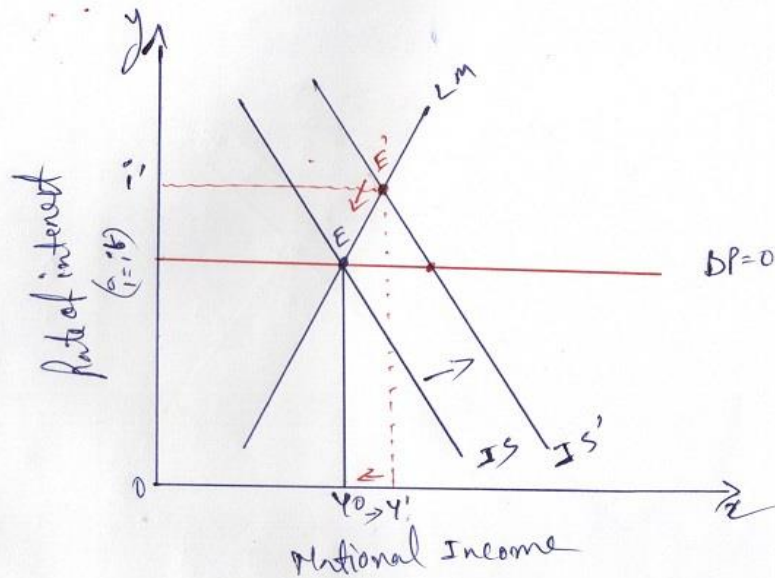
① With expansionary fiscal policy, IS curve shifts to IS' and new eqm is established at E'

⊙ At E', i > i̅
→ capital inflows
→ Supply of foreign exchange increases
→ Appreciates domestic currency
→ Export becomes costlier, NX declines
→ The 'IS' curve shifts back to IS from IS'

# Continue…..

- With the expansionary fiscal policy, the IS curve shifts towards right to IS' and a new equilibrium point E' is established.

- At E', domestic interest rate becomes greater than world interest rate i.e. $(i > i_{f.})$

- This results in inflow of capital from other countries and as a result supply of foreign exchange increases. Therefore, domestic currency appreciates.

- With the appreciation of domestic currency, export becomes costlier and import becomes cheaper and net export decreases.

# Continue…..

- As a result IS curve shifts leftward back to the original position from IS' to IS.

- The equilibrium point is also shifted back from E' to E . Where $(i = i_f.)$ and national income becomes Yo.

- Therefore in under flexible exchange rate with perfect capital mobility, monetary policy is effective but fiscal policy is ineffective.