

LECTURE NOTES

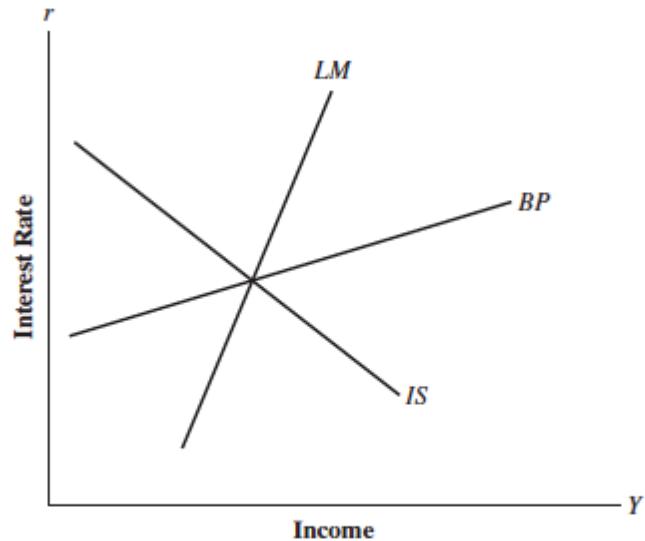
Chapter 15: Monetary and Fiscal Policy in the Open Economy

1. The Mundell-Fleming Model

- An open economy version of the IS-LM model
- Remember:
 - $LM: L(Y, r) \rightarrow r_{LM} = \frac{c_0 - M_0^s}{c_2} + \frac{c_1}{c_2} Y$
 - $IS: S(Y) + T = I(r) + G \rightarrow r_{IS} = \frac{a - b\bar{T} + \bar{I} + G}{d} - \frac{1-b}{d} Y$
- The *LM* function remains the same, the external sector is added to the *IS* schedule
 - $C + S + T \equiv Y = C + I + G + X - Z$
 - $S + T = I + G + X - Z$
 - Imports (Z) depend on income and the exchange rate
 - $Z = Z(Y, e), \frac{\partial Z}{\partial Y} > 0, \frac{\partial Z}{\partial e} < 0$, where e is USD *per* EUR
 - Exports (X) depend on foreign income and the exchange rate
 - $X = X(Y^f, e), \frac{\partial X}{\partial Y^f} > 0, \frac{\partial X}{\partial e} > 0$
- In addition to the *IS* and *LM* schedules, the model contains a *BP* (balance of payments) schedule (Figure 15-1)
 - *BP* schedule: All interest rate-income combinations that result in a balance of payment equilibrium
 - Equilibrium means: The ORT account is zero (which means that $CA + FA = 0$)
 - $BP: X(Y^f, e) - Z(Y, e) + F(r - r^f) = 0$
 - X and M represent the trade balance (net exports) (CA)
 - F represents capital flows (FA), which depends on the difference between domestic and foreign interest rates
 - If $(r - r^f)$ increases, then there are net capital inflows
 - If $(r - r^f)$ decreases, then there are net capital outflows
 - *BP* is upward sloping
 - If income increase, then Z increases but X remains the same
 - Then CA decreases and FA needs to rise to keep $CA + FA = 0$
 - For FA to increase, r needs to increase to attract capital flows
 - **Important: *BP* is upward sloping with imperfect capital mobility (domestic and foreign assets are substitutes, but not perfect)**

- Shifts of *BP*
 - USD depreciates
 - *BP* shifts (parallel) to the right. For a given r , a higher income is needed for Z to rise and the *BP* to be in equilibrium
 - USD appreciates
 - *BP* shifts (parallel) to the left. For a given r , a lower income is needed for Z to fall and the *BP* to be in equilibrium
- A (relative) fall in r^f
 - *BP* shifts (parallel) to the right. Capital inflows decrease and more imports are needed for *BP* to be in equilibrium
- A (relative) rise in r^f
 - *BP* shifts (parallel) to the left. Capital inflows increase and less imports are needed for *BP* to be in equilibrium
- Deficit in *BP*: Points below the *BP* schedule
- Surplus in *BP*: Points above the *BP* schedule

FIGURE 15-1 Open Economy *IS-LM* Model

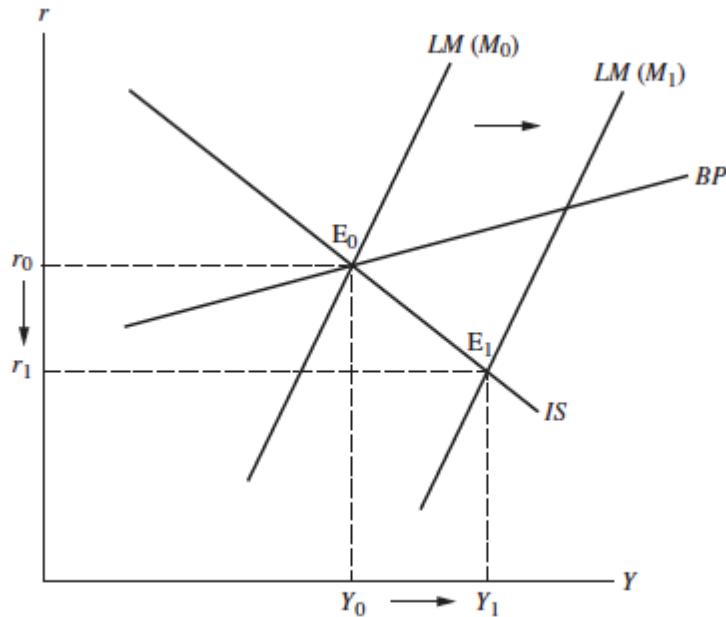


The *LM* schedule shows combinations of r and Y that are points of equilibrium for the money market, and the *IS* schedule shows combinations of r and Y that clear the goods market. The *BP* schedule shows the combinations of r and Y that will equate supply and demand in the foreign exchange market at a given exchange rate.

2. Imperfect Capital Mobility

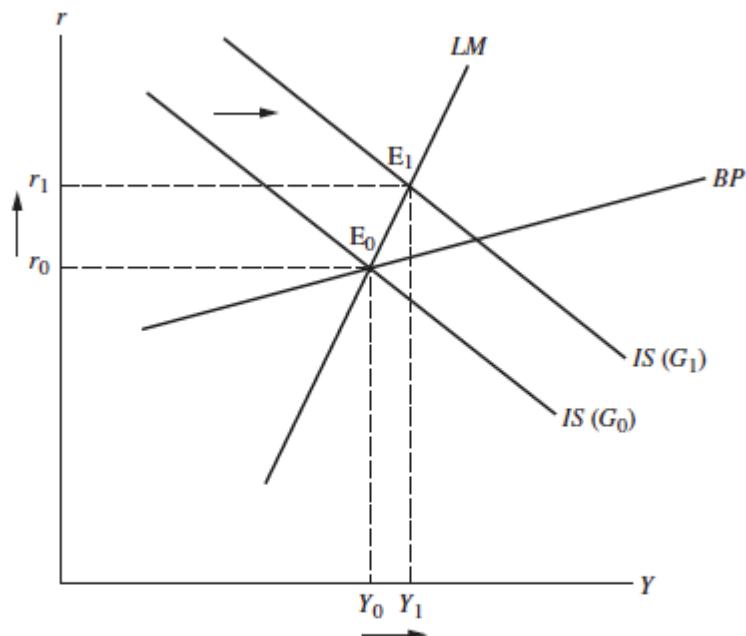
- Policy under fixed exchange rates
 - Monetary policy (Figure 15-2)
 - Assume an increase in the money supply from M_0 to M_1
 - Y increases -> Imports increase
 - BP moves towards a deficit
 - r falls -> Net capital flows decrease
 - BP moves towards a deficit
 - To move to a new equilibrium, fiscal policy needs to accommodate
 - Fiscal policy (Figures 15-3 and 15-4)
 - Assume an increase in government spending from G_0 to G_1
 - Y increases -> Imports increase
 - BP moves towards a deficit
 - r rises -> Net capital flows increase
 - BP moves towards a surplus
 - Is the net effect on BP surplus or deficit?
 - slope BP < slope LM -> expansionary fiscal policy produces a surplus in the BP
 - slope BP > slope LM -> expansionary fiscal policy produces a deficit in the BP
 - The less responsive the FA account is to changes in interest rates the more steep BP is
 - The larger the marginal propensity to import, the steeper BP is
 - To move to a new equilibrium, monetary policy needs to accommodate

FIGURE 15-2 Monetary Policy with a Fixed Exchange Rate



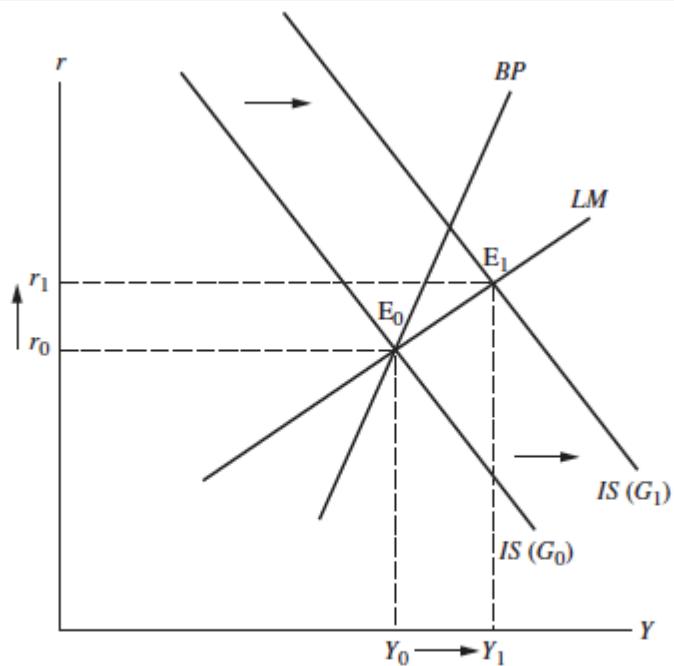
An increase in the quantity of money shifts the LM schedule from $LM(M_0)$ to $LM(M_1)$. The equilibrium point shifts from E_0 to E_1 . The rate of interest falls, and the level of income rises. The new equilibrium point is below the BP schedule, indicating a deficit in the balance of payments.

FIGURE 15-3 Fiscal Policy with a Fixed Exchange Rate



An increase in government spending shifts the IS schedule from $IS(G_0)$ to $IS(G_1)$. The equilibrium point shifts from E_0 to E_1 . Income and the interest rate rise. The new equilibrium point is above the BP schedule, indicating that, with a fixed exchange rate for the case in which the BP schedule is flatter than the LM schedule, the expansionary fiscal policy results in a surplus in the balance of payments.

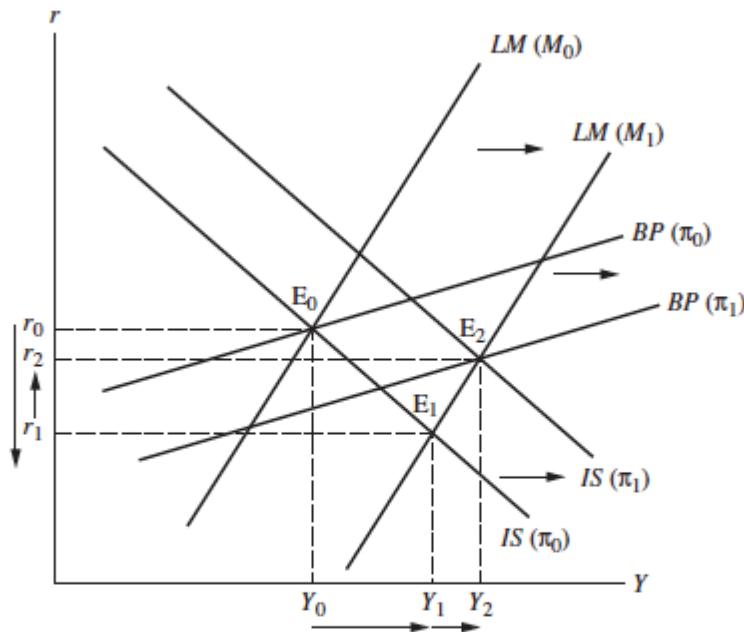
FIGURE 15-4 Fiscal Policy with a Fixed Exchange Rate: An Alternative Outcome



As in Figure 15-3, an increase in government spending shifts the *IS* schedule to the right, increasing both income and the rate of interest. In this case, where the *BP* schedule is steeper than the *LM* schedule, the new equilibrium point (E_1) is below the *BP* schedule. The expansionary fiscal policy results in a balance of payments deficit.

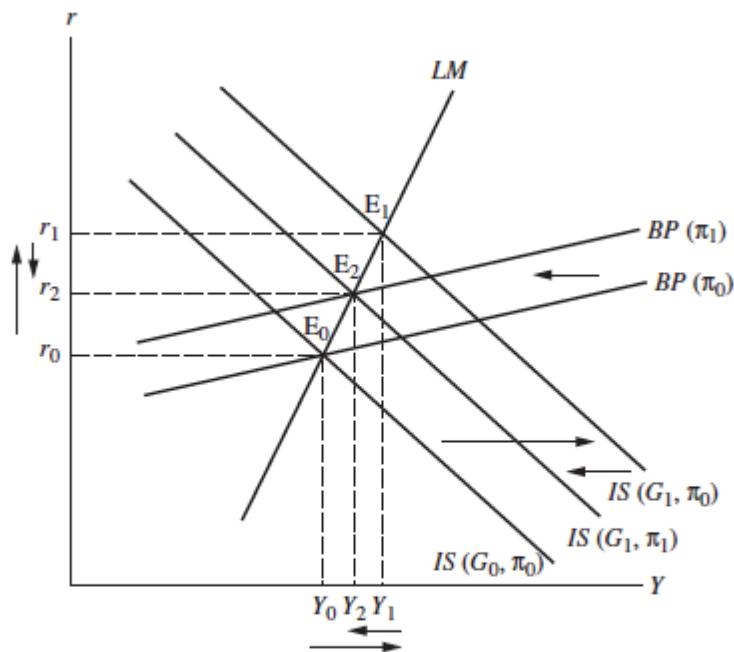
- Policy under flexible exchange rates
 - Monetary policy (Figure 15-5)
 - Assume an increase in the money supply from M_0 to M_1
 - Y increases -> Imports increase
 - BP moves towards a deficit
 - r falls -> Net capital flows decrease
 - BP moves towards a deficit
 - The USD depreciates
 - The BP shifts to the right
 - Exports increase and imports fall, therefore IS also shifts to the right
 - Fiscal policy (Figure 15-6)
 - Assume an increase in government spending from G_0 to G_1 and that slope $BP <$ slope IS
 - Y increases -> Imports increase
 - BP moves towards a deficit
 - r rises -> Net capital flows increase
 - BP moves towards a surplus
 - Net effect is BP in surplus
 - The USD appreciates
 - The BP shifts to the left
 - Imports increase and exports decrease, therefore IS also shifts to the left

FIGURE 15-5 Monetary Policy with a Flexible Exchange Rate



An increase in the money supply shifts the LM schedule to the right, moving the equilibrium point from E_0 to E_1 . The point E_1 is below the BP schedule, where there is an incipient balance of payments deficit. In the flexible exchange rate case, the exchange rate rises, causing the BP schedule to shift to the right from $BP(\pi_0)$ to $BP(\pi_1)$ and the IS schedule to shift to the right from $IS(\pi_0)$ to $IS(\pi_1)$. The final equilibrium point is at E_2 with an income level Y_2 , above Y_1 , the new equilibrium for a fixed exchange rate.

FIGURE 15-6 Fiscal Policy with a Flexible Exchange Rate

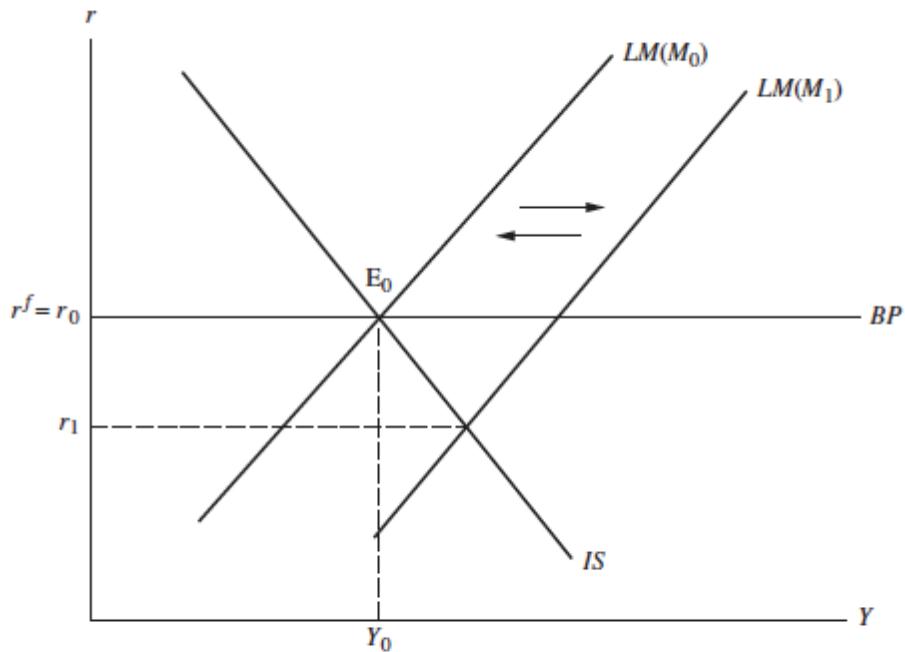


An increase in government spending shifts the *IS* schedule to the right from $IS(G_0, \pi_0)$ to $IS(G_1, \pi_0)$, moving the equilibrium point from E_0 to E_1 . With the *BP* schedule flatter than the *LM* schedule, E_1 is above the initial *BP* schedule, $BP(\pi_0)$. There is an incipient balance of payments surplus, and the exchange rate will fall, shifting the *BP* schedule to the left to $BP(\pi_1)$ and shifting the *IS* schedule to the left from $IS(G_1, \pi_0)$ to $IS(G_1, \pi_1)$. The final equilibrium is at E_2 with income level Y_2 , below Y_1 , the new equilibrium for a fixed exchange rate.

3. Perfect Capital Mobility

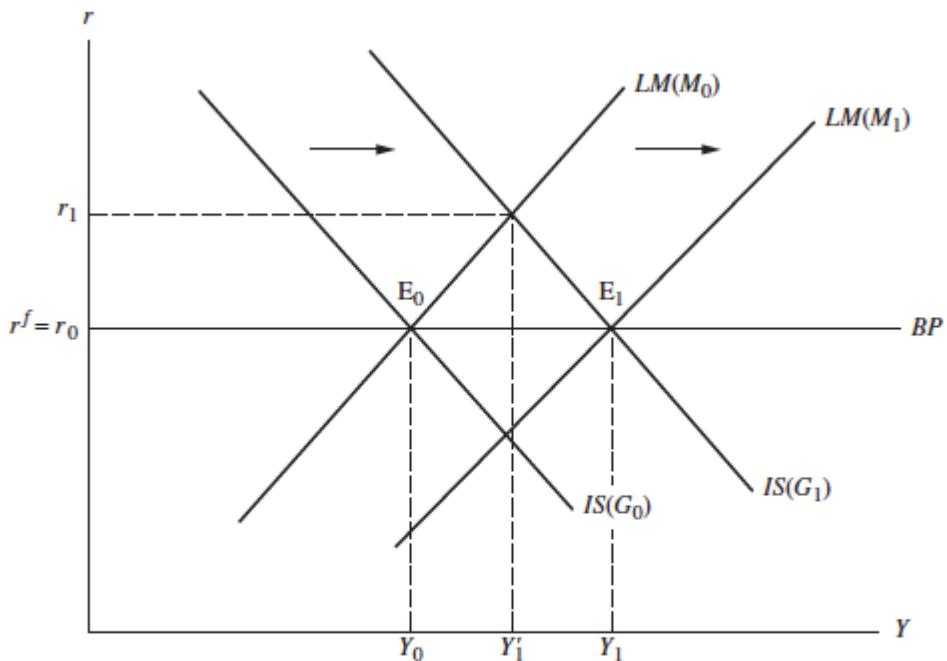
- Domestic and international assets are perfect substitutes
 - Assume no difference in risk and negligible transaction costs
- Then: $r = r^f$
- Any difference between r and r^f produces massive flows of capital. Therefore BP is horizontal
- With imperfect capital mobility domestic interest rates can deviate from international interest rates
 - The country is so small that has no effect on international credit markets
 - The country is big and domestic policy affects international markets but we assume this “second” effect away for simplicity
- Policy under fixed exchange rate
 - Monetary policy (Figure 15-7)
 - Assume an increase in the money supply from M_0 to M_1
 - r falls \rightarrow Net capital flows decrease
 - Demand for foreign exchange increases
 - The domestic central bank supplies the foreign exchange
 - Because of this, (domestic) money supply falls from M_1 to M_0
 - Monetary policy is ineffective
 - Fiscal policy (Figure 15-8)
 - Assume an increase in government spending from G_0 to G_1 and that slope $BP <$ slope IS
 - r rises \rightarrow Net capital flows increase
 - The central bank buys the inflow of capital at the fixed exchange rate
 - Money supply increases and r falls
 - Fiscal policy is effective

FIGURE 15-7 Monetary Policy with a Fixed Exchange Rate



An increase in the money supply shifts the LM schedule from $LM(M_0)$ to $LM(M_1)$. The domestic interest rate falls below the foreign interest rate, triggering a massive capital outflow. Central bank intervention to maintain the fixed exchange rate causes the money supply to fall back to the initial level, M_0 . The domestic interest rate is restored to equality with the foreign interest rate, and income is back at its initial level.

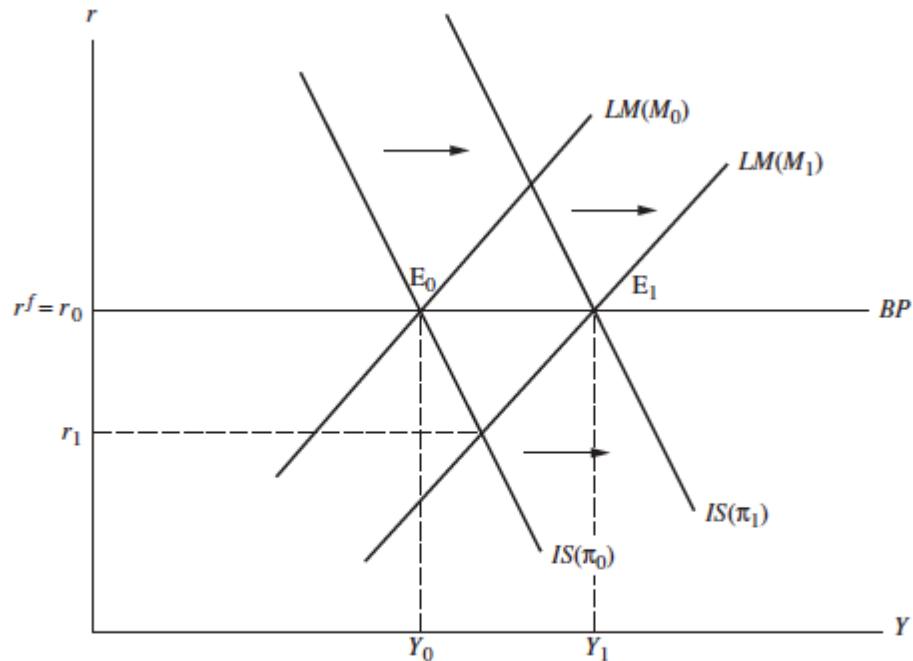
FIGURE 15-8 Fiscal Policy with a Fixed Exchange Rate



An increase in government spending shifts the *IS* schedule from $IS(G_0)$ to $IS(G_1)$. The domestic interest rate is pushed above the foreign interest rate, resulting in a massive capital inflow. Central bank intervention to maintain the fixed exchange rate causes the money supply to rise. The *LM* schedule shifts from $LM(M_0)$ to $LM(M_1)$. The domestic interest rate is brought back into equality with the foreign rate, and the increase in the money supply reinforces the expansionary effect of the increase in government spending.

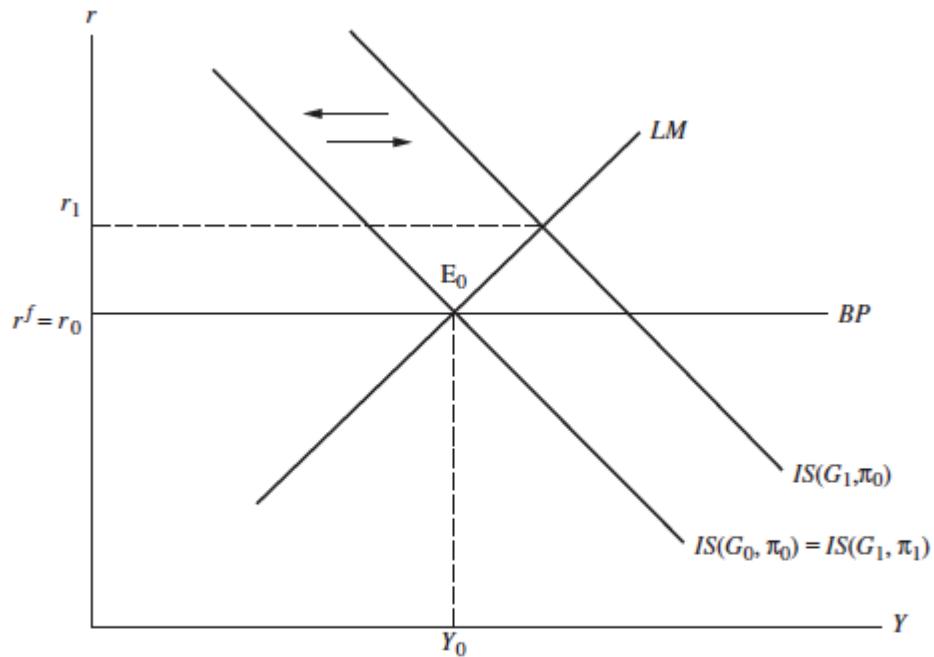
- Policy under flexible exchange rate
 - Monetary policy (Figure 15-9)
 - Assume an increase in the money supply from M_0 to M_1
 - r falls -> Net capital flows decrease
 - Demand for foreign exchange increases
 - USD depreciates
 - Imports decrease, exports increase and therefore the IS also shifts to the right
 - Monetary policy is effective
 - Fiscal policy (Figure 15-10)
 - Assume an increase in government spending from G_0 to G_1 and that slope $BP < \text{slope } IS$
 - r rises -> Net capital flows increase
 - USD appreciates
 - Imports increase, exports decrease and therefore the IS shifts to the left
 - Fiscal policy is ineffective

FIGURE 15-9 Monetary Policy with a Flexible Exchange Rate



An increase in the money supply causes the LM schedule to shift from $LM(M_0)$ to $LM(M_1)$. The domestic interest rate falls below the foreign interest rate, triggering a massive outflow of capital. The capital outflow causes the exchange rate to rise, shifting the IS schedule from $IS(\pi_0)$ to $IS(\pi_1)$. The domestic interest rate is brought back into equality with the foreign interest rate, and income rises to Y_1 .

FIGURE 15-10 Fiscal Policy with a Flexible Exchange Rate



An increase in government spending causes the IS schedule to shift from $IS(G_0, \pi_0)$ to $IS(G_1, \pi_0)$. The domestic interest rate rises above the foreign interest rate, with a resulting massive inflow of capital. The capital inflow causes the exchange rate to fall. The fall in the exchange rate shifts the IS schedule back to $IS(G_0, \pi_0) = IS(G_1, \pi_1)$. The domestic interest rate is reequated with the foreign interest rate, and income returns to its initial level.