The IS-LM-BP=0 Model (aka “Mundell-Fleming”) with Expected Depreciation under Floating and Fixed Rates

In the IS-LM-BP=0 model (with floating exchange rates) presented earlier, capital flows respond only to the interest differential. However, it is more likely that capital flows respond to something more complicated. One alternative is to let it respond to uncovered interest differentials (i.e., uncovered interest parity does not hold). The general result under flexible exchange rates is the fiscal policy efficacy is even more circumscribed, while monetary policy efficacy is enhanced. Finally, we discuss the implications of elevated expectations of devaluation under fixed rates.

1. The Model, under Flexible Rates

Suppose the capital flow equation:

\[ KA = \bar{K}A + \kappa(i - i^*) \]

is rewritten as:

\[ KA = \bar{K}A + \kappa(i - i^* - \Delta s^e_{i_1}) \]

Retain the IS, LM schedules as in the previous set of notes, and re-solving the BP=0 schedule.

\[ Y = \alpha[A + EXP - IMP + (n + \nu)q - bi] \]

\[ i = \frac{\mu}{h} - \left( \frac{1}{h} \right) \left( \frac{M}{P} \right) + \left( \frac{k}{h} \right) Y \]

\[ i = \frac{1}{\kappa} \left[ (EXP - IMP + KA) + (n + \nu)q \right] + \tilde{r} + \Delta s^e_{i_1} + \left( \frac{m}{\kappa} \right) Y \]

Notice that the slope of the BP=0 curve is (still) positive \((m/\kappa)\), and that anything that changes the autonomous components of exports, imports and capital flows will change the position of the schedule. Also note that changes in \(q\) will shift the curve. The difference here is that expectations of exchange rate depreciation will also shift the BP=0 schedule in a manner analogous to the foreign interest rates.
2. Fiscal Policy under Floating Exchange Rates

Shifts in the IS and LM curves occur for the same reasons as before. Consider what happens if one increases government spending.

The IS curve shifts out (arrow [1]). Initially, output is at $Y_i$ and interest rates at $i_i$. However, the equilibrium interest rate is greater than that consistent with external equilibrium; this means capital is
flowing into the economy at a rate greater than that necessary to offset the trade balance. In the fixed exchange rate system, this would mean increases in official reserves. However, under the floating exchange rate system, the home currency experiences pressure to appreciate, i.e., \( q \) falls.

As \( q \) falls, this affects two curves: the IS and the BP=0. Inspect equation (2'); a fall in \( q \) reduces the vertical intercept in the IS curve, so the curve shifts in (arrow shift [3]). Now examine equation (4); a fall in \( q \) makes the vertical intercept larger, i.e., shifts up the BP=0 curve (arrow shift [1]). Note that when capital flows depend upon the uncovered interest differential, and the exchange rate is expected to appreciate, then the BP=0 schedule shifts down (arrow shift [2]). These two shifts are depicted in Figure 2. Notice then that equilibrium income falls to \( Y_2 \) and interest rates to \( i_2 \) (although both of these are higher relative to the initial starting values of \( Y_0 \) and \( i_0 \)).

3. Monetary Policy under Floating Exchange Rates

It is instructive to consider what happens if a monetary expansion is undertaken. Examine the high capital mobility case.

In the figure below, the resulting equilibrium interest rate \( i_1 \) is less than required for external equilibrium. As a consequence, there is an incipient balance of payments deficit and the exchange rate depreciates. The resulting increase in net exports means that the required interest rate for external equilibrium falls (the BP=0 curve shifts downward). The increase in net exports means that domestic aggregate demand rises, and the IS curve shifts out. The equilibrium settles at income level \( Y_2 \) and interest rate \( i_2 \).

![Figure 4: Expansionary monetary policy under floating exchange rates, high capital mobility](image)

Notice that monetary policy is quite powerful. The increase in the money supply shifts out the LM curve (arrow shift [1]) decreases interest rate and hence spurs investment, thereby increasing output. But the lower interest rates also puts negative pressure on the balance of payments, and under a free
float, this manifests itself in a depreciation of the home currency (arrow shift [2]). This depreciation spurs exports and discourages imports, so the expansionary monetary policy “crowds in” net exports (arrow shift [3]). But note that the expected depreciation shifts up the BP=0 line (arrow shift [3]), partially offsetting shift [2], and inducing an even greater exchange rate depreciation. Consequently the outward shift of the IS is even greater than in the case where capital flows depend only on the interest differential.

4. Increased Expectations of Devaluation under Fixed Exchange Rates

Suppose the country is on fixed exchange rates, but at some point the credibility of the exchange rate peg decreases. This results in a shift upward by the amount of the expected devaluation. (For instance, if there is a 50% probability of a 20% devaluation, and 50% probability of a 0% devaluation, then expected devaluation is 10%.)

When the BP=0 line shifts up, then if the government undertakes no action, the interest rate i0 will be less than the interest rate that equilibrates the balance of payments (i_{BP=0}|Y_0). ORT > 0 (foreign exchange reserves decline), and the central bank will have to sterilize the outflow in order to remain at income level Y0. Otherwise, the central bank could allow the LM to shift leftward by not intervening, or could immediately shift the LM back by undertaking contractionary monetary policy immediately.