

## TW Notes on Doing Open Economy IS-LM Analysis

The classical, or monetary, model focuses on transmission through the effects of the flow of international reserves from payments imbalances on money supplies (there is assumed to be no sterilization). The traditional gold standard mechanism is an example. Under fixed rates, a disturbance that generates a payments imbalance generates a change in reserves that causes the money supply to fall in the deficit country and rise in the surplus country. With  $V$  and  $Y$  fixed, this  $\Delta M_s$  causes a  $\Delta P$  which corrects the payments imbalance by reducing the trade balance in the surplus country and increasing it in the deficit country. In this model a freely floating exchange rate would eliminate international transmission and create complete insulation since there would be no payments imbalances and hence no flows in international reserves.

In contrast to the classical model, the IS-LM model emphasizes international transmission through changes in trade flows (which are affected by changes in incomes and the exchange rate). For comparing the effects of fixed versus flexible exchange rates in this framework, the first step is to work out what could happen if the exchange rate were fixed. Then because of the assumption of static expectations we can go from surplus or deficit under fixed rates to appreciation or depreciation under flexible rates. The amount of exchange rate change under flexible rates would depend on the size of the payments imbalance under fixed rates and the factors emphasized in the elasticities approach, i.e. the volume of trade, the magnitude of the elasticities (Marshall-Lerner), and the extent of price feedback effects of changes in the nominal exchange rate on the price level. The higher is the latter, the greater would be the size of the

change in the nominal exchange rate necessary to bring about a given change in the real exchange rate – which is what the elasticities operate on.

For analyzing questions like the strength of monetary and fiscal policy, automatic stabilizer effects, and international transmission effects under fixed versus flexible rates, the best way to proceed is to analyze the effects of a shock on  $Y$  under fixed rates, and then see whether the exchange rate would appreciate or depreciate under flexible rates and analyze which way the exchange rate change would shift the IS curve. Then see whether this shift would lead to an increase or decrease in  $Y$  compared with what happened under fixed rates. (One can of course analyze how changes in the exchange rate would affect the LM curve, but unless explicitly notes we'll assume away this effect in any questions and tests to keep the curve shifting from getting too complicated.) Unless otherwise noted, also assume that payments imbalances are sterilized under fixed rates – unless perfect capital mobility is assumed, in which case sterilization wouldn't be possible. (Sterilization is the standard Keynesian assumption, while monetarists typically assume no sterilization – though of course monetarists prefer their own models to IS-LM.)

Remember the BP curve will be vertical with zero capital mobility, and horizontal at the world interest rate with perfect capital mobility. Foreign booms and recessions (changes in foreign  $Y$ ) and changes in the exchange rate will shift both the IS and BP curves. Under fixed rates, a foreign boom will shift the home IS curve out (since the home country's exports will increase via the foreign country's marginal propensity to import), and a foreign recession will shift the home IS curve in.

With low capital mobility (defined as a BP curve that is steeper than the LM curve), a foreign boom shifts the home BP curve to the right, generating a BoP surplus. Under flexible rates, the home currency would appreciate, shifting back the home IS curve and dampening the amount of international transmission, compared with fixed rates. This is the basis for the traditional argument that fixed rates tend to spread out demand disturbances over the world economy while flexible rates tend to keep them bottled up in the country of origin. Thus with a negative domestic demand disturbance it would be better to have fixed rates to reduce the domestic effect by spreading some of them abroad. In Keynesian terminology, this makes the multiplier smaller because of the effects of  $m$  in the multiplier formula. A flexible rate would depreciate, thereby reducing the effective magnitude of  $m$ . This would in turn increase the multiplier – and with it the impact of the disturbance on the domestic economy. Where the demand disturbance is abroad, it would be better to have flexible rates since they would reduce the amount of the disturbance that is imported.

With high capital mobility, however, these results on inflation and stabilization are reversed. Then a the foreign boom would generate a surplus abroad and a deficit at home. Thus under flexible rates the home currency would depreciate, shifting out the home IS even further than under fixed rates. With high capital mobility, there would be greater international transmissions of demand shocks under flexible rates than under fixed rates. The logic of such “super transmission” is the same as for that of a domestic fiscal expansion under flexible rates. The outward shift of the IS curve leads to currency appreciation, which shifts the IS curve back. The back-shift will be greater, the higher is the degree of capital mobility. With perfect capital mobility, the IS curve would shift all the way back to its original position; perfect capital mobility therefore completely neutralizes the ability of fiscal policy to affect domestic income

under flexible rates. Higher capital mobility makes fiscal policy more powerful under fixed rates since it dampens the effects of the IS shift on interest rates and hence increases the size of the multiplier.

Changes in the LM curve (monetary policy) will affect the balance of payments and exchange rate in the same direction regardless of the degree of capital mobility, because the effects of the induced changes in interest rates and income on capital flows and trade flows operate in the same direction. The degree of capital mobility just affects the size of the effects. Shifts in the IM curve, however, the effects of the changes in interest rates and income work in the opposite direction, which is why the net outcome depends on the degree of capital mobility.

#### Additional Notes on Mankiw

In Mankiw's model with perfect capital mobility the LM\* curve becomes vertical under fixed rates because domestic monetary policy is ineffective and domestic interest rates are determined by the world interest rate. Payments imbalances result in a shift of the LM\* curve (Fig. 12-7). Thus if the domestic monetary authorities try to shift the LM\* curve by changing monetary policy, international capital flows will fully offset the domestic changes in high-powered money and the LM\* curve will be forced back to its original position (Fig. 12-9).

With fiscal expansion under floating rates we get the full crowding out discussed above. The induced capital inflows shift the IS\* curve up along the vertical LM\* curve, resulting in exchange rate appreciation – but no change in  $Y$ , as the reduction in  $X-M$  will equal the increase in  $G-T$  (Fig. 12-4).

Fiscal expansion under a fixed rate causes a balance of payments surplus and shifts out the LM\* curve (Fig. 12-8). This results in the higher Keynesian multiplier associated with constant interest rates rather than the lower multiplier one expects if the money supply is held constant and interest rates adjust.