

14.02 Introduction to Macroeconomics

Problem Set 9 Solutions

1. This is not a contradiction. An increase in the US interest rate, relative to the German interest rate, leads initially to an appreciation of the US dollar against the German DM. This is due to investors wanting to shift the composition of their portfolio of assets towards bonds with the higher rate of return (i.e., US bond). Investors thus sell German bonds, obtain DM, buy dollars and use these dollars to purchase US bonds. Eventually, however, the \$/DM exchange rate returns to the long term rate, which has remained constant; in other words, the \$/DM rate depreciates to the level of the long-term exchange rate.

2. Using the uncovered interest rate parity condition, the peso/dollar exchange rate is expected to depreciate by 21% over the coming year. This implies that the peso/dollar exchange rate is expected to be 9.075 pesos/dollar.

3. Because the multiplier is smaller for an open economy than for a closed one, fiscal policy is less effective when the economy opens up trade in goods, services and assets. Intuitively, an increase in government spending is directed towards domestically as well as foreign produced goods when the economy engages in free trade; thus openness dilutes the ability of fiscal policy to increase domestic income. However, the impact of openness on the ability of monetary policy to change income is uncertain. While the interest rate now impacts income through two channels (directly through investment and indirectly through net exports), the impact on the steepness of the IS curve is uncertain.

4. The trade sector, relative to GDP, of a small open economy is greater than that of a large (relatively more self-sufficient) open economy. The sensitivity of income to a change in the interest rate is greater for a small open economy than for a large open economy, because the channel from interest rates to exchange rates to net exports is more significant the larger the trade sector (the smaller the open economy). Thus the IS curve of a small open economy is flatter than that of a large open economy. The multiplier for a small open economy is smaller than that of a large open economy since an autonomous change in expenditure is directed proportionally more to foreign goods than if the country were large and relatively self-sufficient. As a result of a small open economy's flat IS curve and small multiplier (relative to the curvature of a large open economy's IS curve and multiplier, respectively), fiscal policy is less effective and monetary policy more effective at changing income for a small open economy.

5. In many of these developing countries, the rate of inflation was high, leading to a rapid overvaluation of the real exchange rate. This overvaluation leads to a decrease in net exports, and a decline in domestic output. Thus due to the overvalued real exchange rate, a fixed nominal exchange rate may have recessionary effects.

6. Expectations of a devaluation forces the country trying to maintain a fixed exchange rate to offer a higher rate of interest to compensate investors for the risk of a devaluation. This higher interest rate is undertaken using contractionary monetary policy. The high domestic interest rate depresses investment, which depresses domestic income.

7. The French domestic interest rate must be 5 percentage points higher than the German interest rate in order to compensate investors for the risk of devaluation. In order to maintain the exchange rate today, the French government must undertake contractionary monetary policy and offer higher interest rate.

8. A country suffering from an overvalued exchange rate can either immediately devalue the exchange rate, or wait for prices to fall. Assume first that we are at a short run equilibrium in which income is less than the natural level (the intersection of AS and AD is to the left of the vertical Y_n line). This is perfectly plausible since exchange rate overvaluation depresses domestic income by making domestic goods more expensive in comparison to foreign goods; moreover an overvalued exchange rate may generate fears of a devaluation which forces the government to increase the interest rate on its bonds. This high interest rate depresses investment. If the government devalues, this leads to an increase in NX (through Marshall-Lerner) and to a rightward shift of the AD curve to a new equilibrium at Y_n . Thus a devaluation leads to higher P in the LR equilibrium where $Y=Y_n$.

However, if the economy waits for price adjustments to bring the economy to LR equilibrium, at the LR equilibrium the price level will have decreased from the initial SR (recessionary) equilibrium. This transition to LR equilibrium, with gradual price adjustment may take much longer than the transition elicited by the devaluation. This is due to the fact that it takes time for prices to adjust, especially if the adjustment of prices and wages is downwards. Wage indexation tends to speed up this transition from the SR to the LR somewhat.

9. If the fixed exchange rate regime has an impact on the allocation of labor, the process of wage negotiation or the structural composition of industry, then switching from floating to fixed exchange rate regimes will have an impact on the natural level of output. This may actually be the case within the special case of a monetary union, which imposes a fixed rate of exchange among its members (i.e., via the common currency). However, if the switch in exchange rate regimes impacts only demand (i.e., increasing investment) this leads to a temporary increase in short-run income.