

Quiz 3 Solution Set
14.02 Macroeconomics
May 23, 2006

I. Answer each as True, False, or Uncertain, and explain your choice.

1. If individuals are forward-looking, current money demand should depend on both current and expected future nominal interest rates.

Ans:

False. The opportunity cost of holding money today depends on only the current nominal interest rate. If nominal interest rates were to change in the future, there would be ample time to adjust money balance then, so expected changes in interest rate should not affect money balance today.

2. A monetary expansion always shifts up the LM curve and leaves the IS curve unchanged.

Ans:

False. A monetary expansion can also shift the IS curve if it leads financial investors, firms and consumers to revise their expectations of future interest rates and output.

3. A fiscal contraction always reduces output in the short run.

Ans:

False. A fiscal contraction improves the budget balance, and leads to a lower interest rate and a higher investment in the medium run. Hence, it may actually lead to an economic expansion in the short run, as firms and households update their expectations on future output and future interest rates.

4. Under fixed exchange rates, fiscal policy is more powerful in moving output than it is under flexible exchange rates.

Ans:

True. Under fixed exchange rates, the central bank must accommodate a fiscal expansion (contraction) by undertaking a simultaneous monetary expansion (contraction). Both policies move output in the same direction.

5. The effect of fiscal policy on output is stronger in an open economy with fixed exchange rates than in a closed economy.

Ans:

Uncertain. For the same argument provided in (4), this statement seems to be true. However, part of the effects on domestic demand falls on foreign goods in an open economy, while all the effects falls on domestic goods in a closed economy. The former makes fiscal policy stronger in an open economy with fixed exchange rates than in a closed economy, and the latter makes it weaker, so the comparison of the overall effect is ambiguous.

II. Long Questions:

1. Expectations:

Consider the following description of an economy:

$$\text{IS: } Y = A(Y, r, T, Y'^e, r'^e, T'^e) + G$$

$$\text{LM: } \frac{M}{P} = YL(r)$$

There are two periods: the current period (the short run) and the future period (the medium run). Primes denote future period values, and “e” denotes an expectation. For simplicity, assume that current and future inflation, actual and expected, are equal to zero, so the real and the nominal interest rates are equal. Assume initially that $Y = Y'^e = Y_n = Y'_n$, $r = r'^e = r_n$, $T = G = T'^e = \bar{T}$. In words, output, current and expected, is equal to the natural level of output, which is itself constant. The real interest rate, current and expected, is equal to the natural interest rate – the real interest rate associated with the natural level of output. Taxes, current and expected, are constant, and equal to government spending.

Now suppose that a major technological discovery is made, which leads people and firms to expect a higher natural level for output in the future: Y'_n increases, and so does Y'^e . Assume $r'^e = r'_n$ is unchanged, and so are taxes, current and expected.

- a. What will be the effect on output (Y) and the interest rate (r) in the current period (or in the short run)? Show the result graphically. Explain in words.

Ans:

See Figure 1.

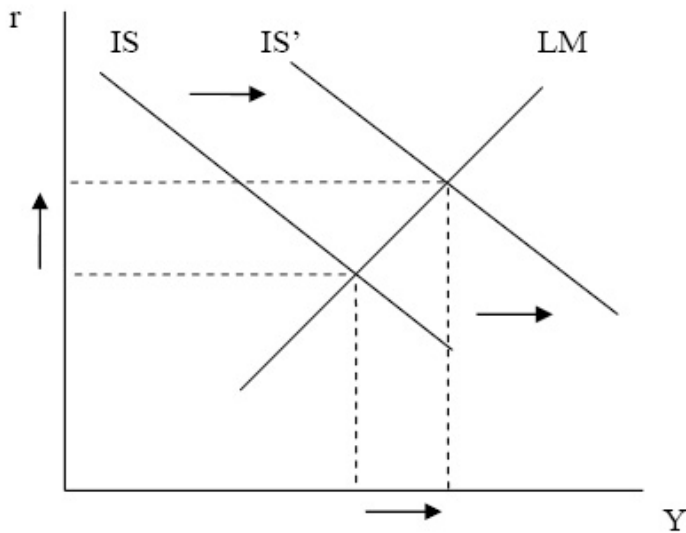


Figure 1:

An increase in expected future output boosts the aggregate demand today. Holding everything else constant, the IS curve shifts out, while the LM curve stays the same. As a result, both output and the interest rate increase in the short run.

- b. Suppose you are in charge of monetary policy. What should you do? (Hint: You want to increase the interest rate through a contractionary open market operation. Why?)

Ans:

The major technological discovery is expected to increase the natural level of output in the future but leaves the current Y_n unchanged. As current output Y increases and exceeds Y_n , inflation will accelerate according to the Phillips curve. To restrain inflation, the central bank should tighten the money supply. As a result, the LM curve shifts up, leading to a further increase in r while keeping Y at its natural level.

2. The Mundell-Fleming Model:

Consider the following description of an open economy in the short run:

$$\text{IS: } Y = C(Y - T) + I(i, Y) + G + NX(Y^*, Y, E)$$

$$\text{LM: } \frac{M}{P} = YL(i)$$

$$\text{UIP: } E = \frac{(1+i)}{(1+i^*)} \bar{E}^e$$

- a. Characterize graphically the equilibrium, and the equilibrium values of Y, i, E for given values of $T, G, Y^*, \frac{M}{P}, i^*, \bar{E}^e$.

Ans:

See Figure 2.

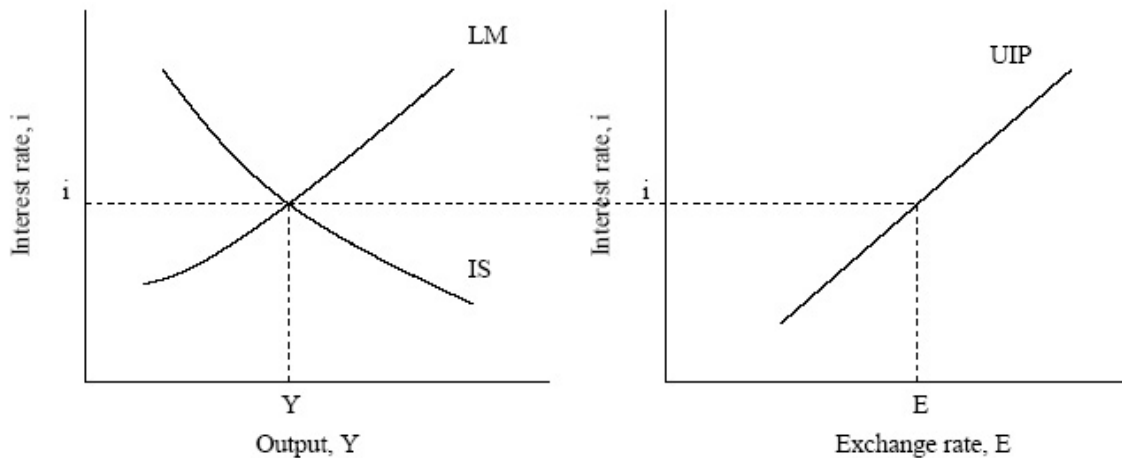


Figure 2:

Now suppose that investors in the foreign exchange market start expecting a large depreciation of the domestic currency (e.g., the US dollar) in the future.

- b. Characterize graphically the effects on Y, i and E . Explain in words.

Ans:

See Figure 3.

As investors change their expectations on future exchange rate, specifically $\bar{E}^{e'} < \bar{E}^e$, the UIP curve shifts up. Expecting a large depreciation of the

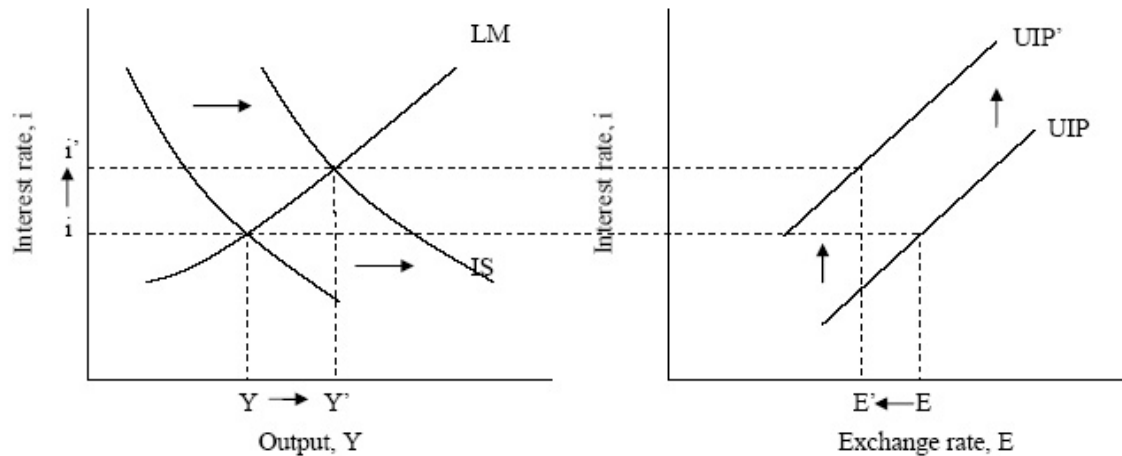


Figure 3:

domestic currency, investors must either require a higher interest rate on domestic bonds or start selling off domestic assets. An expected depreciation precipitates an immediate depreciation. The depreciation of the domestic currency shifts the IS curve to the right, leading to higher Y and higher i . The increase in interest rate prevents further selling of domestic assets and thus restrains the current depreciation. As a result, Y increases, i increases, and E decreases.

Assume that initially (before the change in expectations), output was equal to its natural level Y_n .

- c. How can you use monetary policy to keep output unchanged? What are the implications for the interest rate and for the exchange rate?

Ans:

Based on answers to part (b), the central bank should tighten money supply, which shifts up the LM curve and thus can keep output at its natural level Y_n . A monetary contraction further increases i , in other words, further reduces the interest rate differential, and thus reduces the initial depreciation (i.e., E still decreases but by less than in part (b)). However, no monetary policy can perfectly defend a currency (i.e., no change in E) while keeping output intact at the same time.

- d. How can you use fiscal policy to keep output unchanged? What are the implications for the interest rate and for the exchange rate?

Ans:

Based on answers to part (b), fiscal policy can be used to move the IS curve back to the left, so that the new IS curve and the LM curve intersect at the original equilibrium (Y_n, i) . As a result, output remains the same, and so does the interest rate. This implies that the expected depreciation will occur immediately, and the exchange rate will fall by more than in part (b).

- e. Suppose that there is initially a large trade deficit (e.g., the United States). Would you want to use fiscal or monetary policy in this case?

Ans:

Given a large trade deficit, part (c) and (d) suggest that fiscal policy should be more favorable, because a large depreciation of the domestic currency can help improve the trade balance.