Answer Key for Problem Set 4
(Chapters 18-19)

Instructor: Kanda Naknoi

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ANSWER 1

If investors expect the Fed to reduce interest rate, based on the uncovered interested parity (UIP) they will expect the dollar to depreciate. According to the UIP:

\[ i = i^* + \frac{E^e}{E} - 1, \]

where \( i \) is the domestic interest rate, \( i^* \) is the foreign interest rate, \( E \) is the current spot rate and \( E^e \) is expected future spot rate. If the domestic interest rate falls in the future, given that foreign interest rate is constant then the dollar will depreciate. However, this change in interest rate policy has not happened today. What happens today is that the expectation of future exchange rate or \( E^e \) rises, to reflect anticipation about depreciation of the US dollar.

As a result, the expected foreign return will increase and hence the FR schedule in Figure 1.ab shifts upward from \( FR_1 \) to \( FR_2 \). The depreciation from \( E_1 \) to \( E_2 \) increases trade balance (TB), since depreciation increases competitiveness of American exporters in the world market. The increase in TB causes the IS schedule in Figure 1.a to shift to the right from \( IS_1 \) to \( IS_2 \). Consequently, \( Y \) increases and so does \( C \). Also, since \( i \) rises, \( I \) falls. The other effect of the rise in interest rate is an increase in the domestic return in the foreign exchange market, or a shift of the
DR schedule from DR₁ to DR₂. Therefore, the exchange rate falls from E₂ to E₃. Note that E₃ still reflects depreciation comparing to E₁.

**ANSWER 2**

To stabilize output in Figure 1.a, the government must shift the IS curve from IS₂ back to IS₁ using contractionary fiscal policy. The fiscal contraction can be either a cut in government spending or a tax hike. As a result of this policy, output returns to Y₁, which is the same as the original level. Consumption will also return to its original level. At the same time, this fiscal contraction reduces the nominal interest rate from i₂ to i₁. Thus, investment returns to its original level too.

In the foreign exchange market, the fall in interest rate reduces the domestic. Therefore the exchange rate in Figure 2.b increases from E₃ to E₂, which indicates depreciation comparing to the exchange rate before fiscal contraction. The dollar depreciation increases competitiveness of American exporters in the world market, thus the US trade balance increases.

**ANSWER 3**

To stabilize the exchange rate at E₁, the European Central Bank (ECB) must reduce its euro interest rate such that the FR schedule in Figure 3.b shifts from FR₂ to FR₃. The goal of this policy is to remove depreciation pressure on the dollar. Then the exchange rate will change from E₃ to E₁. Note that there are no changes in Figure 3.a comparing to Figure 1.a in ANSWER 1, which depicts the IS-LM model for the US. The reason is that the interest rate cut here is implemented by the ECB, not the Fed in the US.
ANSWER 4

The N-1 problem describes the situation in which one country under a gold exchange standard can maintain monetary independence, although all other member countries must give up monetary independence. Such asymmetric positions arise because other member countries agree to intervene in foreign exchange market to maintain fixed exchange rates. But the center country does not need to intervene in foreign exchange market but intervene in the gold market instead. In the case of the Bretton Woods system, the center country is the US.

Under the gold standard or any metallic standard, the N-1 problem does not exist. This is because under a metallic standard all countries must intervene in the gold market. This requirement implies that all countries in this system must give up monetary independence in order to maintain fixed exchange rate.

ANSWER 5

The Trilemma states that any central bank cannot achieve the following 3 objectives at the same time:

1. Free capital mobility: \( i = i^* + \Delta E^e/E \)
2. Fixed exchange rate policy: \( i = i^* \)
3. Independent monetary policy: \( i \neq i^* \)

When the central bank adopts policy (1) and policy (2), the central bank must give up independent monetary policy or ability to create inflation. This is because inflationary policy can create expectations about future depreciation, i.e. \( \Delta E^e/E > 0 \), which essentially leads to (3) or violation of the Trilemma. This situation arises when the central bank extends credit to the government permanently. Hence, we can consider the following two policies as inconsistent policies: fixing exchange rate and permanent domestic credit expansion.

The breakdown of the Bretton Woods system followed a long period of money expansion in the US. As a result of money expansion in the US, in the beginning other countries also followed by implementing money expansion in order to keep the exchange rate fixed. Specifically, when the Fed expanded money supply and created depreciation pressure on the US dollar, other central banks intervened by purchasing U.S. government bonds. That resulted in an increase in foreign exchange reserves and money expansion around the world. But the fear of inflation eventually caused foreign central banks to sell US government bonds and that characterized the dollar crisis or the breakdown of the Bretton Woods system.