

1. (20%) In July, 1985, the prime lending rate was 9.5% in the U.S., but only 8.1% in Germany, and the German Deutschemark (DM) traded at 2.91 DM per dollar.

1.1. The direct price of the DM =  $1/2.91 = \underline{\$0.3436}$ .

The one-year forward rate  $E^f = \$0.3436(1.095/1.081) = \underline{\$0.3481}$ .

If you use the simple formula,  $E^f = \$0.3436(1.014) = \$0.3485$ . Close enough.

1.2. The direct price of the DM in Francs is  $0.3436/0.113 = \underline{3.041}$  francs.

1.3. At 46.5 cents, the forward market correctly guessed the direction of the change, but vastly underestimated the amount.

1.4. Suppose that an American importer signed a contract in July 1985 to import 100 BMWs, at a price of 20,000 DM each due in one year's time. (That is 2 million DM.)

1.4.1. He could hedge by buying DM on the spot. He would need \$635,787 (or roughly \$636,000) to buy 1,850,139 DM now. At 8.1% interest, that turns into 2 million DM in a year.

1.4.2. He could hedge by buying DM with a forward contract at \$0.3481. In a year he would need \$696,186 to buy 2 million DM. At 9.5%, that is \$635,787 now.

1.4.3. If he really expected the dollar to appreciate by 5%, he might decide to speculate by waiting a year to buy DM on the spot. In that case, he would need \$930,000 in a year, which is worth \$849,315 now. He loses big, as this costs 34% more.

1.4.4. He could buy a call option in case the DM appreciates too much, and be the holder. Since the forward price is higher than the spot, a call at the forward price would be cheaper. Absolutely, he would strike when the DM rose to \$0.465.

2. (15%) U.S. international transactions in 1960:

2.1. The Balance on Current Account was \$2.824 billion, the sum of lines 2, 13, 9, 30, and 35.

2.2. The Statistical Discrepancy was -\$1.019 billion, the negative of the sum of all lines.

2.3. The Balance of Payments, not including the Statistical Discrepancy, was -\$2.599 billion, the sum of all lines except lines 41 and 56.

2.4. The Official Settlements Balance was \$3.618 billion, the sum of lines 41 and 56.

2.5. Because line 41 is a credit, the Federal Reserve decreased its foreign exchange reserve assets (by \$2.145 billion). Foreign central banks increased their dollar-denominated reserve assets (by \$1.473 billion).

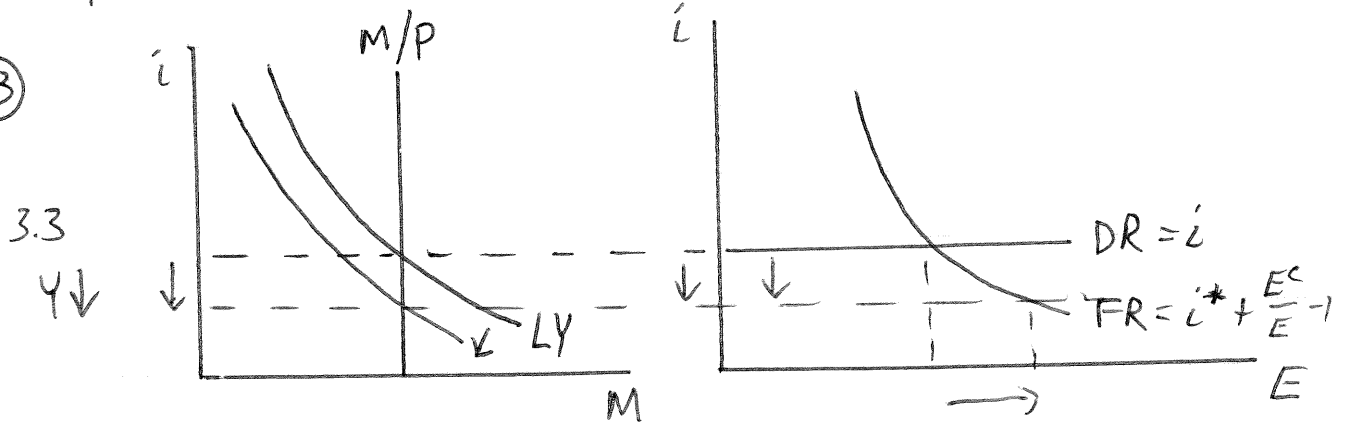
2.6.  $GNE = GDP - TB = \$526.4 - \$3.5 = \underline{\$522.9 \text{ billion}}$ .

$GNDI = GNE + CA = \$522.9 + \$2.8 = \underline{\$525.7 \text{ billion}}$ .

3. (20%) Show the side-by-side graphs for the money market and the forex markets.
  - 3.1.  $M/P = LY$ ;  $i = i^* + \Delta E/E$ , where  $\Delta E/E = (E^e/E - 1)$ .
  - 3.2.  $E = P/P^*$ ; or  $\Delta E/E = \pi - \pi^*$ . These apply in the long-run.
  - 3.3. If  $Y$  drops temporarily, then money demand declines,  $i$  falls, and  $E$  rises. Show graphs.
  - 3.4. If  $M$  increases,  $i$  falls, and  $E$  rises.  $P$  should rise in the long-run, so  $E^e$  rises, and this makes  $E$  rise again. It overshoots. Show graphs.
  - 3.5. The Fisher equation is  $i = r + \pi^e$ . If  $i = i^* + \Delta E/E$  and  $\Delta E/E = \pi - \pi^*$ , then  $(i - i^*) = (\pi - \pi^*)$  and  $(i - \pi) = (i^* - \pi^*)$ , so  $r = r^*$ .
  - 3.6. If  $\sigma^*$  increases suddenly,  $E$  should fall. As  $(i - \sigma) = (i^* - \sigma^*) + \Delta E/E$ , they cancel out.
  
4. (15%) Consider a simple two-period intertemporal PPF for the United States in 1960.
  - 4.1. Show graph for the optimal choice  $C$  for current and future consumption without international financial flows, plus domestic savings  $S_D = Y_0 - C_0$ , investment  $I$ , both current and future production  $(Y_0, Y_1)$ , both current and future consumption  $(C_0, C_1)$ , and the marginal rate of return on investment  $(1 + r)$ .
  - 4.2. The U.S. has saving outflows ( $S_F < 0$ ), domestic investment falls, future U.S. output falls, the marginal rate of return on investment rises, the trade balance is in surplus in the present, and the trade balance in the future will be in deficit. Show graph.
  - 4.3. With no initial external wealth, the long-run budget constraint for a two-period model is  $TB_0 + TB_1/(1 + r) = 0$ .
  
5. (10%) A transfer of savings from the U.S. to the foreign country increases demand for forex, and increases  $E$ . Show graph. If the foreign central bank is committed to maintaining a fixed exchange rate, this would cause excess demand for forex, which is a BOP surplus for them (and a deficit for the U.S.). The foreign central bank would have to buy dollar-denominated reserve assets, which would increase its money supply.
  
6. (10%) Consider two countries, Home and Foreign.
  - 6.1. If Foreign's return on investment is higher, this should increase  $E$ .
  - 6.2. If Foreign's return on investment is negatively correlated with Home's, this should lead investors in both countries to want to diversify their assets by also investing in the other country. This increases both supply and demand, leading to a greater forex volume.
  - 6.3. Even if there was no difference in average returns, no correlation between them, and no difference in domestic savings rates, there would still be reduced overall risk from pooling uncorrelated assets, by buying both foreign and domestic assets.
  
7. (10%) Show the graph for the PPF and the free-trade equilibrium. Trade is balanced, as  $\Delta HG/\Delta LG = (Q_{HG} - C_{HG})/(Q_{LG} - C_{LG}) = -(P_{LG}/P_{HG})$ , which can be rearranged to show that  $P_{LG}(Q_{LG} - C_{LG}) = P_{HG}(C_{HG} - Q_{HG})$ , or exports = imports. A net outflow means  $S_F < 0$ , and this reduces both  $C_{LG}$  and  $C_{HG}$ , assuming both goods are normal. So exports rise, imports fall, and  $P_{LG}(Q_{LG} - C_{LG}) - P_{HG}(C_{HG} - Q_{HG}) + S_F = 0$ .

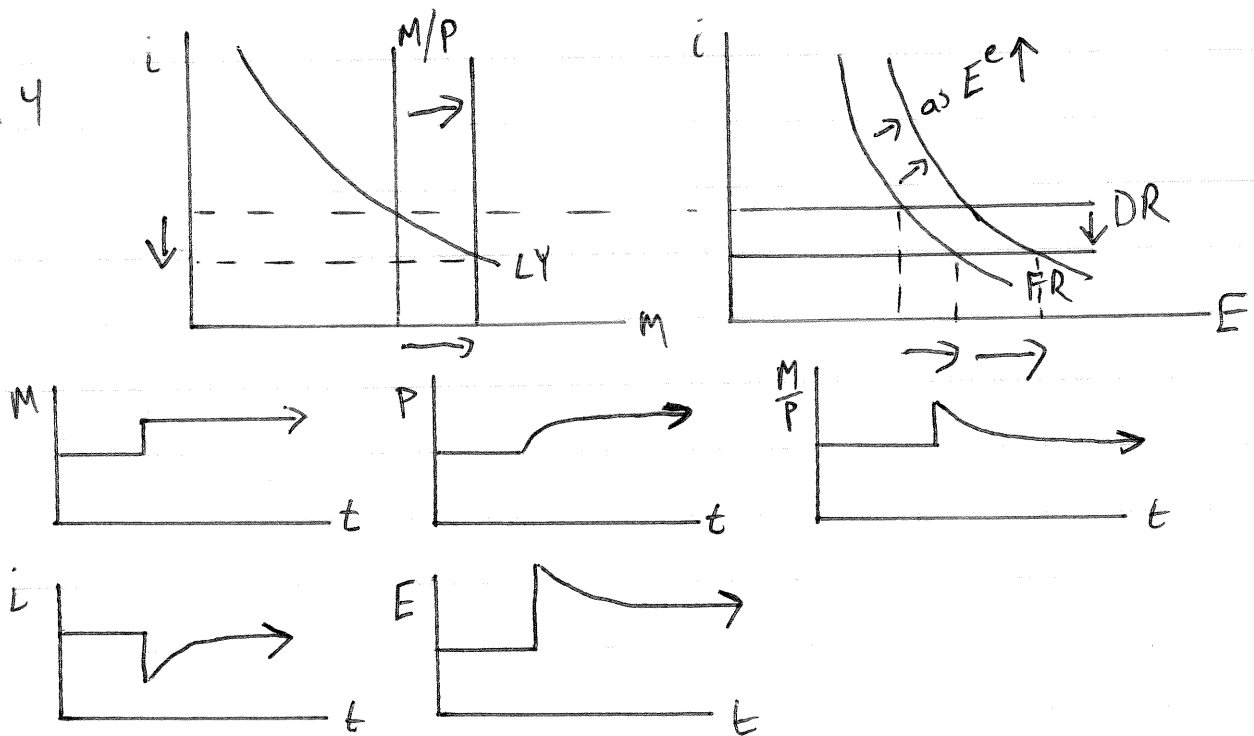
# Graphs

③



$i \downarrow E \uparrow$  temporarily - and then return to normal.

3.4



3.6

