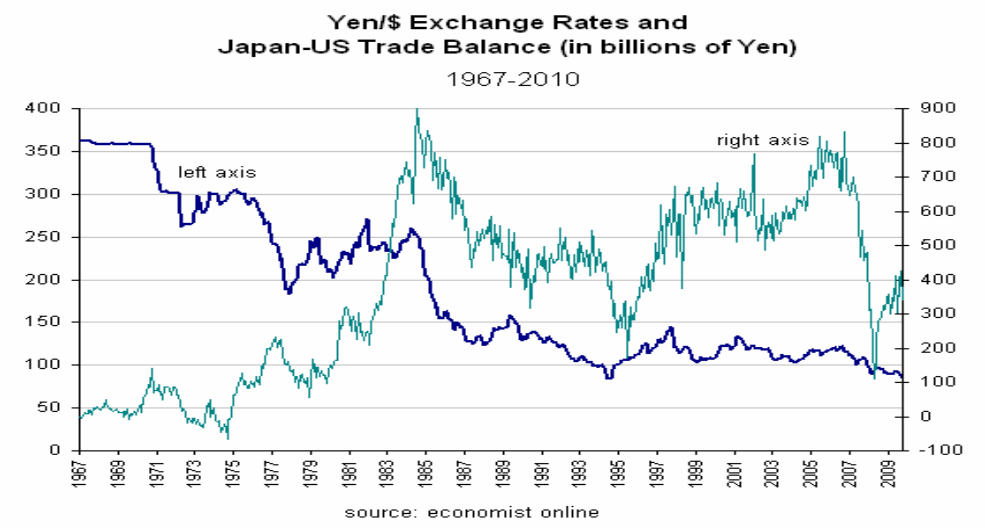
Suggested Answers

Problem 1
Exchange rate and trade balance



1) A: Japanese Yen has appreciated (360-90)/90=300% against US dollar, or US dollar has depreciated (360-90)/360=75% against Yen.

   From 1967 to early 1980s, Yen's appreciation was correlated with an increase of Japan's trade surplus with the US. Then from 1985 to 1995, Yen appreciated against US dollar sharply, from over 250 Yen/$ to below 100 Yen/$. During this period, Yen's sharp appreciation reduced Japan's trade surplus with the US. After 1995, Yen was traded within 100-150 range, and Japan's trade surplus again trended upward, until the global recession hit in 2007.

2) Is above observation contradictory to what you've leaned? Why or why not?

   A: No, it's not contradictory. The above described pattern between yen/$ exchange rate and Japan-US trade balance demonstrated the folly of simply relying on currency appreciation to cure trade deficit problem. According to the theory, Yen's appreciation will reduce its trade surplus with the US - this was certainly the case during 1985-95 period. However, US trade deficit is also driven by many other factors, with the most important being US' own pattern of consumption and production. We know CA deficit = (C+I+G) – Y, everything else being equal, when consumption exceeds production, the US will run trade deficit. So even when Yen appreciated, but if the US increased its consumption of Japanese goods, the US is still likely to run a trade deficit with Japan.

3) Finally, explain why Japanese Yen has risen so much against the US dollar over time. (Hint - you may find this formula useful: q = EP*/P)

   A: The reason was mainly because in the process of transforming Japan from a developing country to a developed country, its labor productivity had been rising fast. The rising labor productivity was a combination of higher capital intensity (or capital-labor ratio) and higher skill intensity of Japanese workers.

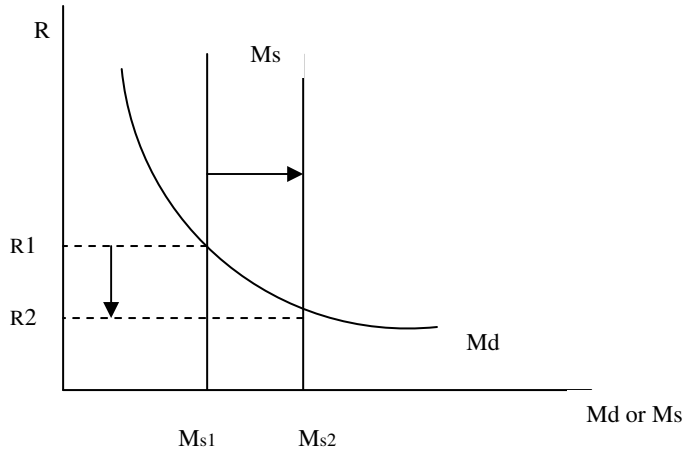
When labor productivity increases, wages in both tradable sectors and non-tradable sectors tend to rise. Higher wage over time pushes up the average price in Japan, $P_{J.}$, and the real purchasing power of Japanese consumers relative to other countries. According to real exchange rate, $q_{¥/\$} = E_{¥/\$} * P_{US}/P_{J.}$, when P_J rises, $q_{¥/\$}$ falls, indicating a real appreciation of Japanese Yen.

Problem 2

Monetary policy during crisis

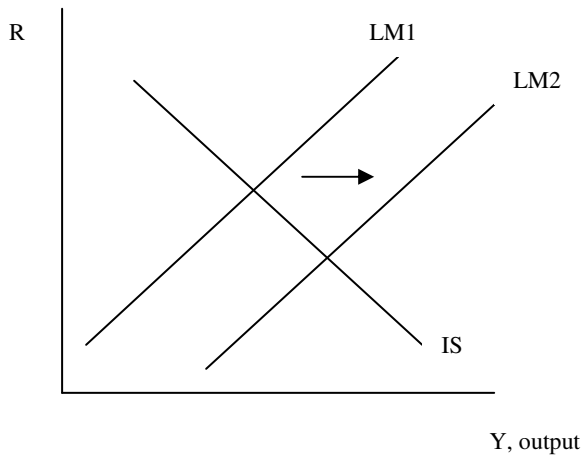
1) The money policy tool during normal times is interest rate, i.e., central banks, such as the Fed, control money supply through adjusting short term interest rates. Show and explain how interest rate and money supply are connected.

   A: The situation can be best illustrated using the money demand and money supply curves.



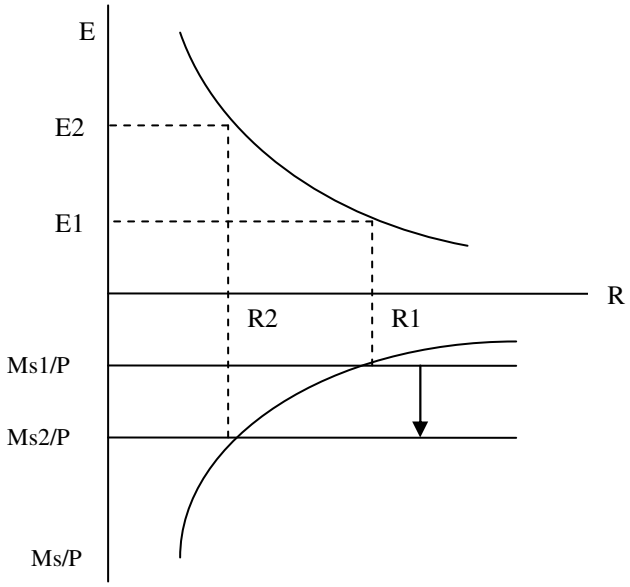
   Interest rate and money supply are negatively correlated. When the Fed lowers interest rate, money supply increases.

2) A: We can analyze the question within IS-LM framework, with both curves using R on vertical axis and Y on horizontal axis. To increase output, the Fed may choose to increase money supply. By doing so, LM curve shirts outward from LM1 to LM2.



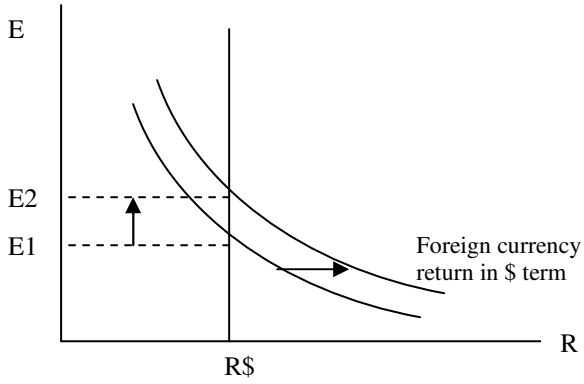
When this happens, an increase of output corresponds to a drop in interest rate. So to increase output, the Fed should lower interest rate.

3) A: This can be easily analyzed using the general equilibrium model we learned in class between the two markets: the FX market and money market.



Fed's QE operation essentially increases money supply. Using the graph above, it corresponds to a downward shift of Ms curve, so interest rate drops from R1 to R2, and exchange rate depreciates from E1 to E2.

4) A: US dollar depreciated even without actual QE operation because investors expected that the Fed will engage in QE operations in the future. From 3) above, QE increases money supply and depreciates $, so investors expect dollar to depreciate in the future.



According to UIP, R$ = R*+ (Ee-E)/E, when this happens, Ee increases, and the curve representing the foreign currency return in $ term (the right hand side of the UIP equation) shifts outward, resulting in an immediate depreciation of the US dollar, i.e., exchange rate moves from E1 to E2.