1a. In the long run, the price level equals the ratio of money supply to money demand. A 25% larger increase in the Japanese money supply than in the US money supply implies that the Japanese price level should increase 25% more than the US price level. **Relative purchasing power** parity in turn implies that the Japanese yen should depreciate by 25% in relation to the dollar in the long run. Thus the exchange rate 10 years from now should be about \$1 = 150 yen. This theory applies in the long run because it requires prices to be flexible, and it is based on PPP, which holds best in the long run.

b. The higher output growth would make the value of the yen appreciate 30%, so combined with the 25% depreciation due to the money supply growth described above, this implies an appreciation on net (of 5%), that is, more dollars per yen.

2a. If **absolute PPP** holds, real exchange rate equals 1.

b. If **UIP** and **Covered Interest rate Parity (CIP) hold**, the forward exchange rate equals the expected future spot rate. Therefore, the forward exchange rate is 1.1.

UIP: (E_{R/P}^e - E_{R/P})/ E_{R/P} = R - F_p
Covered Interest Rate Parity: (FR/P - ER/P)/ ER/P = R - F_p

So E_{R/P}^e = FR/P = 1.1

c. Not enough information.

Using real interest rate parity, we know that the real interest rates are the same across the two countries, but we can’t compute the value

Note: Using real interest rate parity, we can find that:

so k_R - k_F = \Pi^e_{Br} - \Pi^e_{Ar}, i_R = 20\%, \Pi^e_{Br} - \Pi^e_{Ar} = 10\%. Therefore, i_F = 10\%

But this only tells us about the nominal interest rates in the countries, not the real interest rates.

d. According to UIP, i_R = i_F + (E_{R/P}^e - E_{R/P})/ E_{R/P}: 0.2 = 0.1 + 0.2 = 0.1 + \left(\frac{1.1 - x}{x}\right). Therefore x = 1.

3a. See diagram below.
d. Overshooting does not apply to the temporary case, that is, the exchange rate in the short run does not move more than in the long run. This is because there is no shift in expectations about the future exchange rate to amplify the movement in the current exchange rate. This only occurs in the permanent case.