Suggested Solutions to Problem Set 1

1 Multiple Choice.

1. d
2. a
3. a
4. b
5. c
6. c
7. d
8. d
9. c
10. a

2 Nominal Anchors in the Long Run.

See Section 5 Chapter 3 of the textbook (pay special attention to the section The Long Run: The Nominal Anchor). Try to understand the equations.

a ER target. The ER is the anchor variable. From relative PPP we know that $\frac{\Delta E}{E} = \pi_H - \pi_F$ so

$$\pi_H = \frac{\Delta E}{E} + \pi_F \tag{1}$$

Hence, if the ER if fixed then $\frac{\Delta E}{E} = 0$ and $\pi_H = \pi_F$. In this monetary regime domestic inflation in the LR is the same as the foreign inflation (home imports monetary policy and inflation from the foreign economy). PRO: This monetary regime is simple and transparent. CON: Have to be careful to which currency the domestic country pegs its ER (have to fix to a country with low inflation).

b Money Supply Target: When prices are flexible (i.e. in the Long run) we know from the money market that $P_H = \frac{M_H^s}{L(i_H)Y_H}$. Hence if the interest rate in the long run is constant, from the last equation we get that

$$\pi_H = \mu_H - g_H \tag{2}$$

where $\mu_H = \frac{\Delta M_H^S}{M_H^S}$ is the money supply growth in home, and g_H is the real output growth. In this monetary regime THE ANCHOR VARIABLE IS μ_H. If μ_H is stable and low then inflation at home might be stable and low. PRO: This is a mechanical monetary regime. There is little decision making for Central Bank. CO: Can achieve π target if g_H is known but the problem is that nobody knows future real income growth (not even central bankers).

c Inflation target plus interest rate policy. For a given world interest rate (r^*)we know from the Fisher equation that $i_H = r^* + \pi_H^e$. The anchor variable is i_H. If the world interest rate remains unchanged, then as long as the average home nominal interest rate is kept stable, inflation can also be kept stable. PRO: Flexibility for central bankers. In the SR the central bank has the freedom to let i_H to fluctuate temporarily, but in the long run promises to set $i_H = r^* + \pi_H^e$ on average.

Figure 1: Argentine Peso USD ER 1990-2002

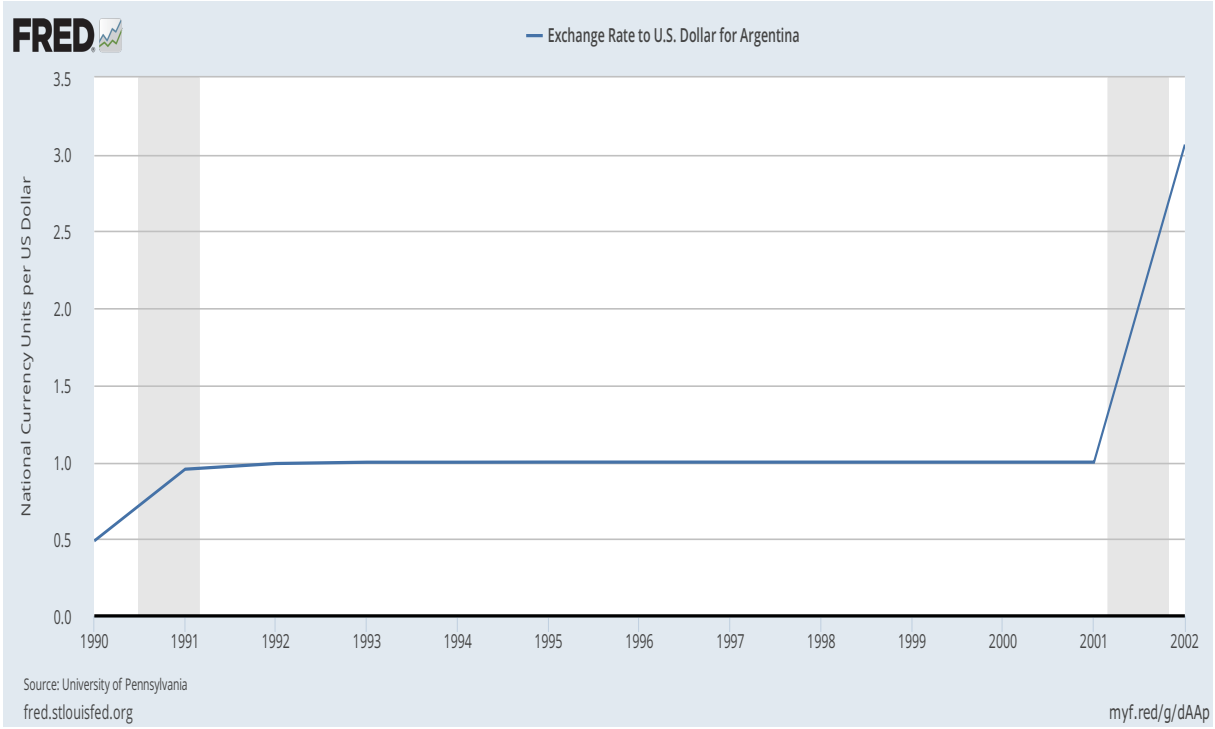
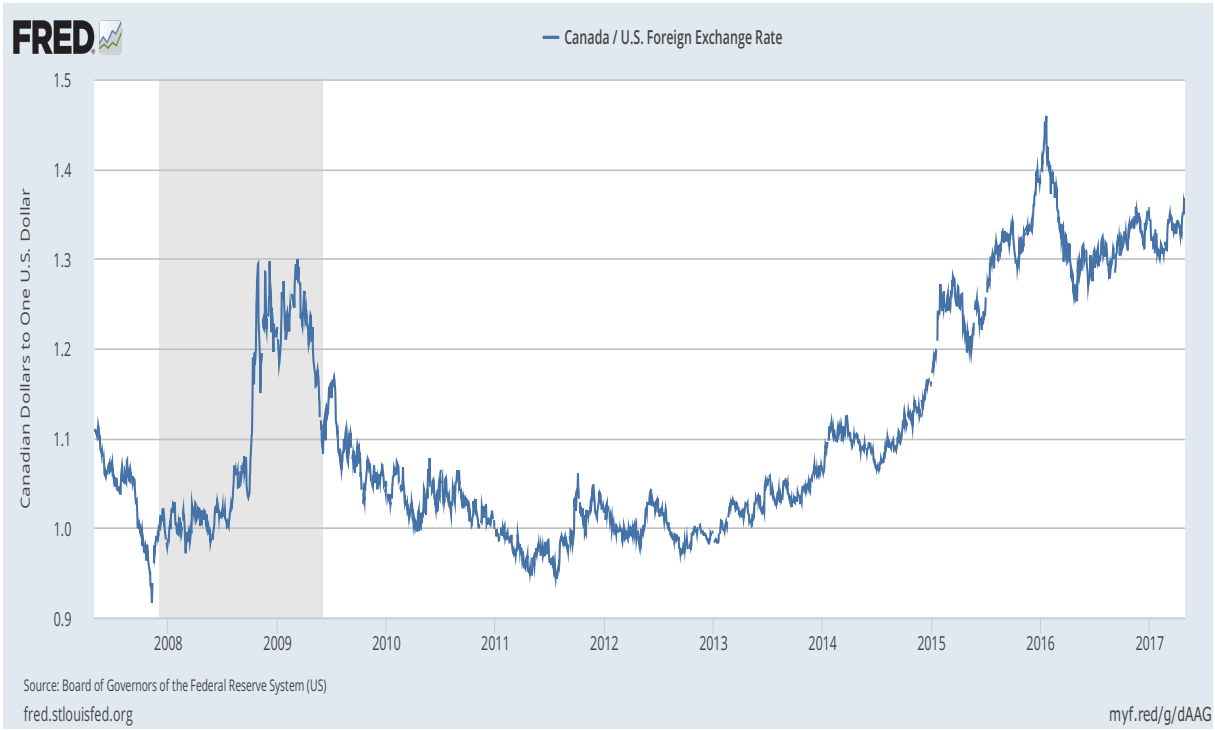


Figure 2: CAD USD ER



3 Exchange Rate Regimes

a Argentina. See Figure 1. Fixed Exchange Rate 1991-2001.

b Canada. See Figure 2. Float 2007-2016

c Indonesia. See Figure 3. Crawling peg 1986-1997.

4 Outsourcing.

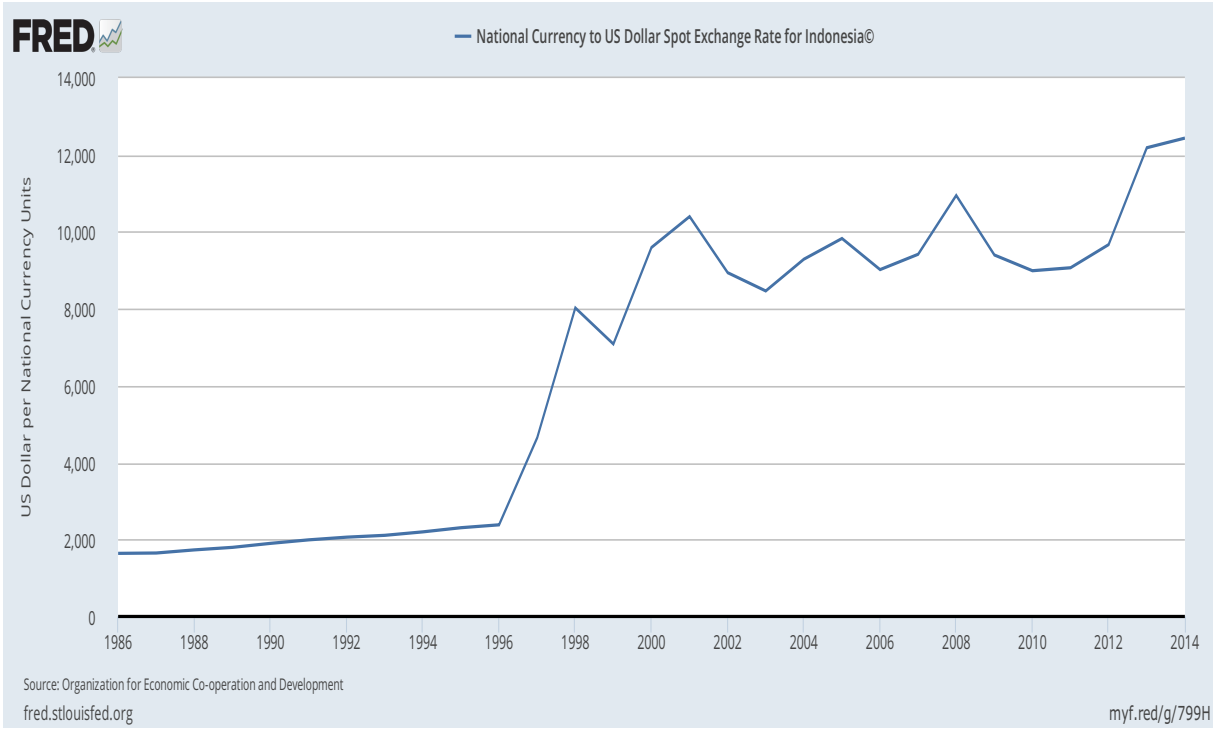
If the Chinese Renminbi appreciates, all else equal, we would expect outsourcing to diminish. If, as the problem states, much of the outsourcing is an attempt to move production to locations that are relatively cheaper, then USA becomes relatively cheap when the Chinese Renminbi appreciates (US dollar depreciates). While it may not be as cheap a destination as some other locations, at the margin, labor costs in US will have become relatively cheaper, making some firms choose to retain production at home.

For example, imagine that the labor costs of producing a computer in China is $220 and the extra transport cost is $50, but the American costs is $300, then we would expect the firm to outsource because the cost of the Chinese computer would be only $270. On the other hand, if the dollar depreciated 20% against the Chinese Renminbi, the labor costs in China would now be $264 (that is, 20% higher in dollar terms, but unchanged in local currency). This, plus the transport costs makes production in China more expensive than in the US, making outsourcing a less attractive option.

5 Money Market and Foreign Exchange Market.

a In the short run (point B in Figure 4), the increase in real money demand will shift the real money demand schedule upwards, pushing up the domestic interest rate and appreciating the Swedish kronor (SK) relative to the Danish krone (DK). Since the increase in real demand of money in Sweden is temporary, then the real money demand schedule will go back to its original location as soon as the real money demands falls to its initial level. This will push down the interest rate to its original level and increase the exchange rate to its initial level as well. For that reason, points A and C are the same.

Figure 3: Indonesian Rupiah USD ER



b In the short run (point B in Figure 5), the increase in real money demand will shift the real money demand schedule upwards as in the previous part, pushing up the domestic interest rate and appreciating the Swedish kronor (SK) relative to the Danish krone (DK). Since the increase in real demand of money in Sweden is now permanent, then we expect a fall in the price level and the nominal exchange rate in the long run. This can be easily checked using the fundamental equation of the monetary model to the exchange rate:

$$E_{H/F} = \frac{P_H}{P_F} = \frac{\frac{M_H}{L_H(i_H)Y_H}}{\frac{M_F}{L_F(i_F)Y_F}} \tag{3}$$

The lower expected exchange rate shifts downwards the foreign return schedule (FR) and reduces even more the nominal exchange rate (relative to a temporary shock): point B. Now in the long run, when prices start to fall, the real money supply increases and this shifts the real money supply schedule to the right (from MS1 to MS2), this in turn reduces the domestic interest rate to its original level (point C). The fall in the domestic interest rate raises the nominal exchange rate from E^2 to E^3. We observe this depreciation of the Swedish kronor (SK) relative to the Danish krone (DK) due to the lower returns of the Swedish assets when the domestic interest rate falls.

6 Money Supply Shocks and the Nominal Exchange Rate.

a A temporary decrease in the U.S. money supply (shift of MS to the left) raises the US interest rate (the DR schedule shifts up). The higher domestic interest rate makes more attractive the domestic assets so there is higher demand for US dollars relative to the British Pound and an appreciation of the USD relative to the pound. After the shock the economy moves from point A to point B in Figure 6.

b The U.S. interest rate increases, the British interest rate does not change, $E_{\$/£}$ decreases. Since this is a temporary shock then neither $E^e_{\$/£}$ nor the U.S. price level change. Since this a domestic temporary shock the British price level does not change.

c In the long run the economy is at point C in Figure 6. All of the variables return to their initial values in the long run. This is because the shock is temporary, implying the central bank will increase the money supply from M2 to M1 in the long run. Since this a domestic temporary shock the British price level does not change.

Figure 4: Swedish kronor (SK) and Danish krone (DK) and Money Market: Temporary Shock

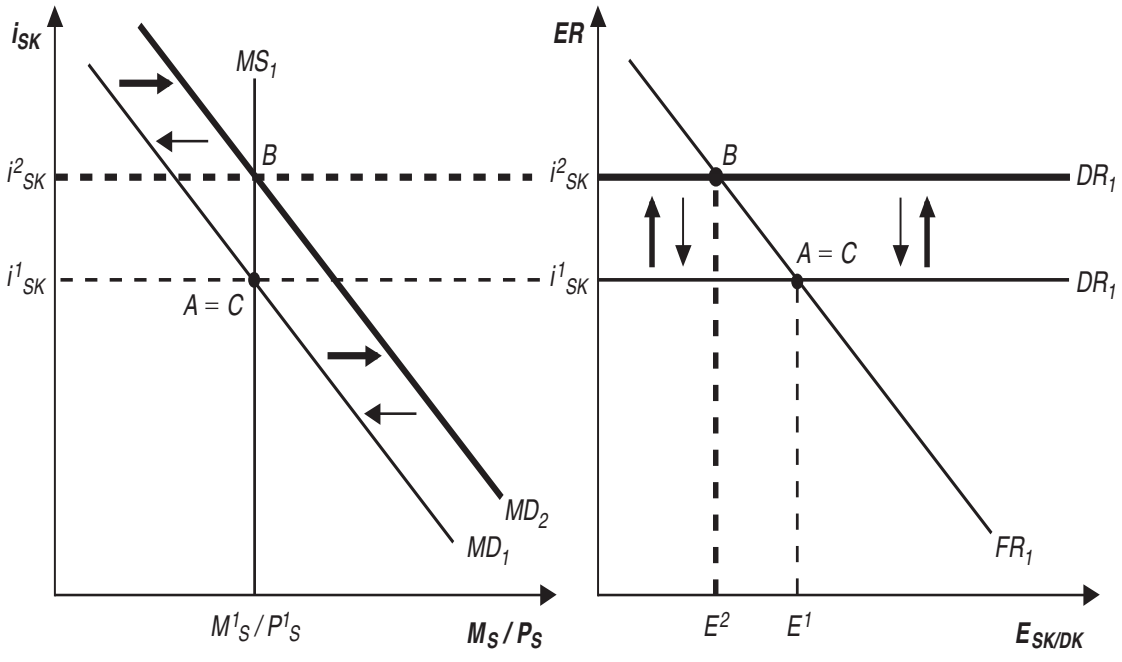


Figure 5: Swedish kronor (SK) and Danish krone (DK) and Money Market: Permanent Shock

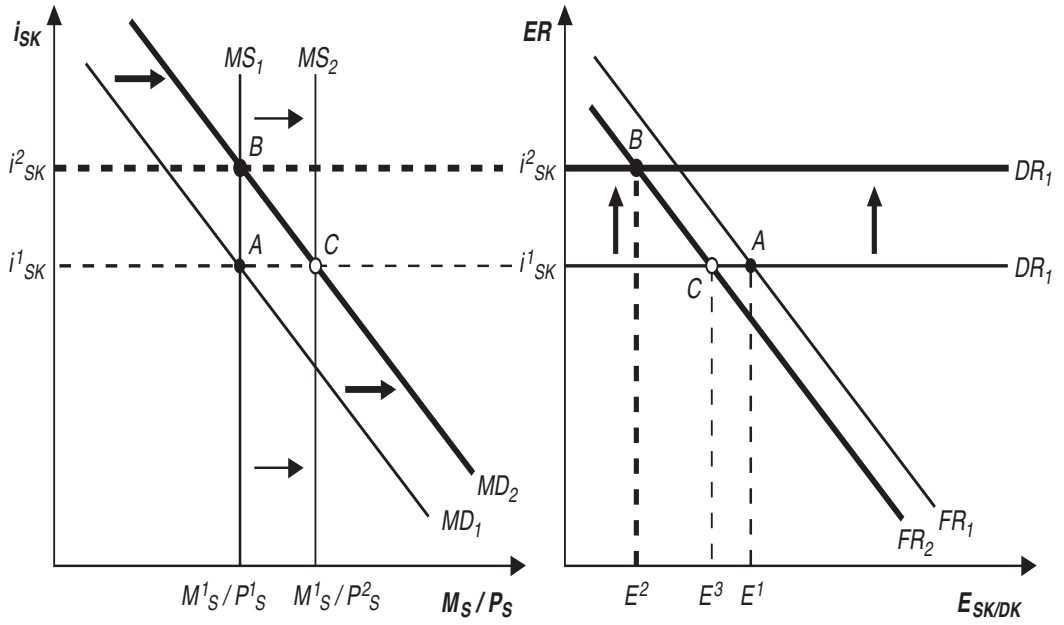
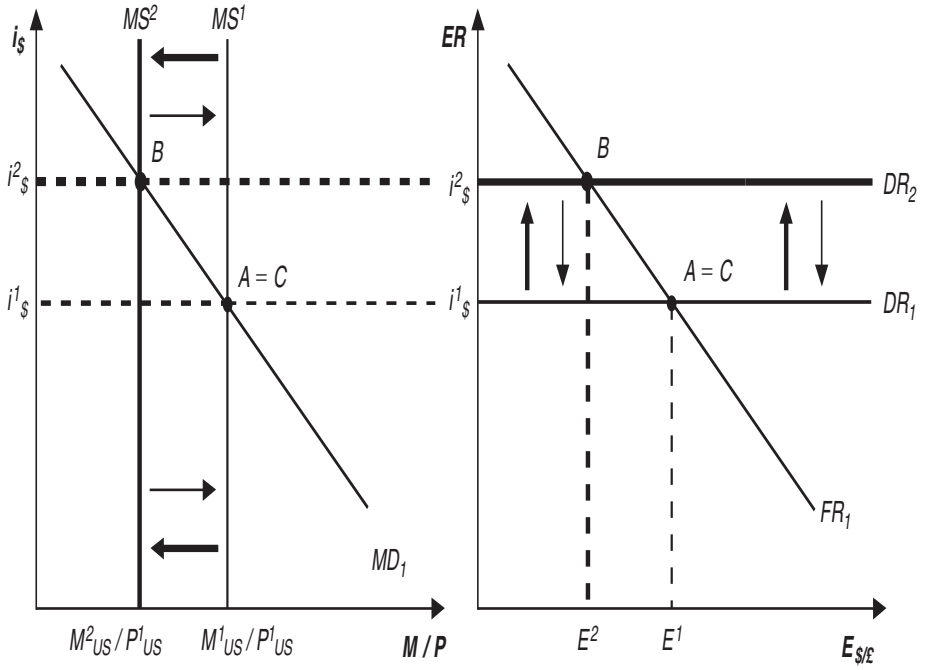


Figure 6: USD and British Pound Exchange Rate and Money Market: Temporary Shock



7 Fundamental Equation to the Exchange Rate (General Model).

a The fundamental equation of the monetary model of the exchange rate is:

$$E_{H/F} = \frac{P_H}{P_F} = \frac{\frac{M_H}{L_H(i_H)Y_H}}{\frac{M_F}{L_F(i_F)Y_F}} \tag{4}$$

An increase in M_F pushes foreign prices P_f up and $E_{H/F}$ down so the domestic currency appreciates relative to the foreign currency. There is no effect on the domestic price level. Domestic and foreign real money balances do not change. Check equation 4.

b An increase in M_H pushes domestic prices up and $E_{H/F}$ so the domestic currency depreciates relative to the foreign currency. There is no effect on the foreign price level. Real money balances do not change because M and P rise by the same amount so the ratio $\frac{M}{P}$ does not change. Check equation 4.

8 Answer True or False.

a **True**. Let P and P^* be the domestic and foreign price level, respectively. Then, according to PPP $E = \frac{P}{P^*}$. Taking percentage changes of both sides gives us,

$$\frac{\Delta E}{E} = \pi - \pi^* \tag{5}$$

In other words, the rate of domestic currency depreciation equals the domestic rate of inflation minus the foreign rate of inflation. Hence, if $\pi > \pi^*$ then $\frac{\Delta E}{E} > 0$ which implies a DEPRECIATION.

b **False**. Without loss of generality assume that Canada is the domestic economy and U.S. is the foreign economy. Hence, from the the Uncovered Interest Parity condition we know that

$$R_{CAD} = R_{US} + \frac{E^e_{H/F} - E_{H/F}}{E_{H/F}} \tag{6}$$

When the domestic currency depreciates (i.e. higher $E_{H/F}$), the initial cost of investing in foreign currency deposits increases, thereby **decreasing** the expected rate of return of foreign currency deposits (you need more CAD to invest the same amount of USD).