

# Solutions

## Chapter 20 : "Exchange Rates and Internacional Finance"

Charles Jones (2013). *Macroeconomics*,  
3<sup>rd</sup> Edition.

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# Problem 1

$$EP = PW \Rightarrow E = \frac{PW}{P} = \frac{42.96}{4.37}$$

example Norway vs US

Country	Big Mac Price (local currency)	Exchange rate per dollar (\$)	Big Mac price in dollars	Exchange to equalize prices	% Change in exchange rate*	Adjustment
US	4.37	1	4.37	1.00	-44.28%	Depreciate
Norway	42.96	5.48	7.84	9.83	-10.42%	Depreciate
Euro area	3.61	0.74	4.88	0.83	24.50%	Appreciate
Japan	319.62	91.06	3.51	73.14	50.67%	Appreciate
Mexico	36.95	12.74	2.9	8.46	69.99%	Appreciate
China	15.99	6.22	2.57	3.66	79.84%	Appreciate
Russia	73.02	30.05	2.43	16.71	115.29%	Appreciate
South Africa	18.37	9.05	2.03	4.20	161.64%	Appreciate
India	89.19	33.4	1.67	20.41		Appreciate

\*For example, the appreciation in the Japanese yen is measured as:  $(1/91.06) / (1/91.06)$ .

(E)

$$\frac{\$ / \text{Norway}}{E} =$$

Norway vs US

## Problem 2

The IS function with NX dependent, upon the exchange rate is given by

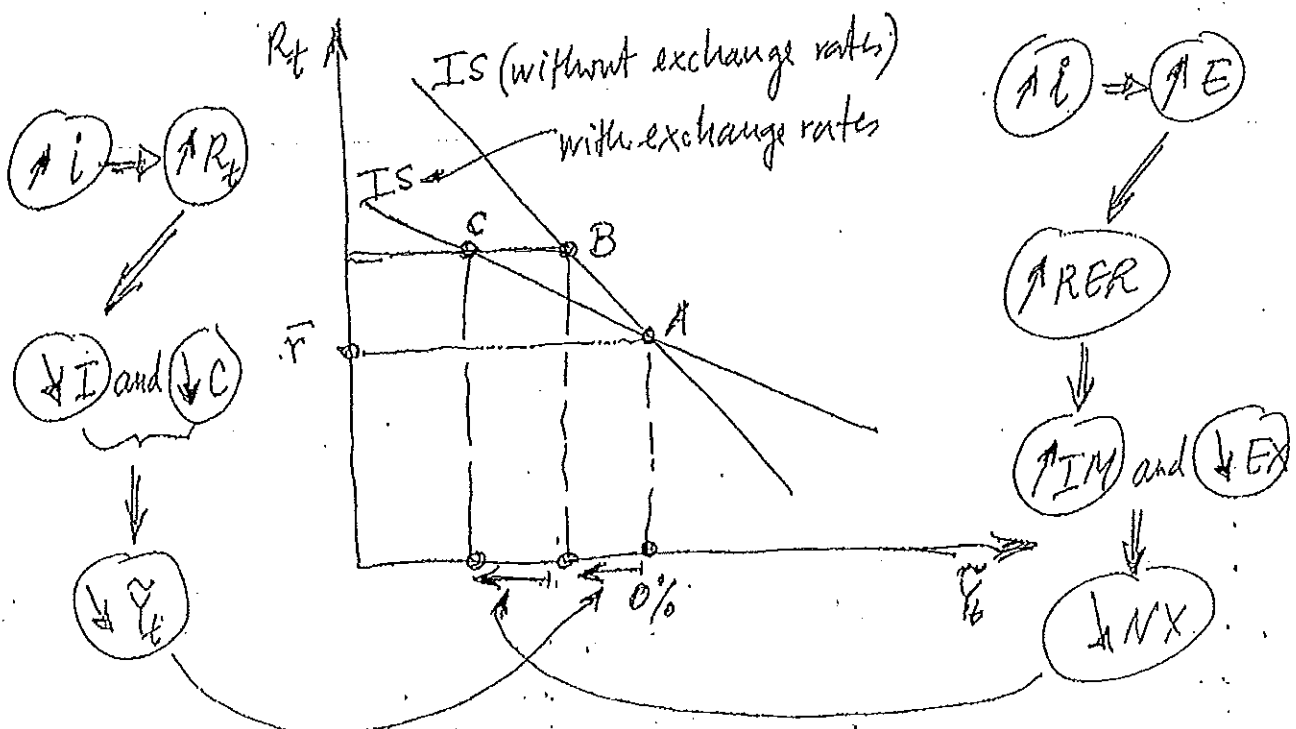
$$\bar{Y}_t = \bar{a} - \bar{b} (R_t - \bar{r})$$

with

$$\bar{a} = \bar{a}_c + \bar{a}_i + \bar{a}_g + \bar{a}_{nz} - 1 + \bar{b}_{nz} (\bar{R}^w - \bar{r})$$

$$\bar{b} = \bar{b}_i + \bar{b}_{nz}$$

From these results it is easy to explain that the IS function is flatter...



### Problem 3

$$(a) \quad g_E = g_{PW} - g_P$$

"g" for growth rate

-2.1%

$$(b) \quad g_E = 3.6\% - 5.7\% = -2.1\%$$

Price of the dollar goes down.

$$(c) \quad E_{75} \approx 300$$

$$E_{95} \approx 100$$

To calculate the average growth rate we do

$$E_{95} = E_{75}(1 + g_E)^{20}$$

$$\ln E_{95} = \ln E_{75} + 20 \times \ln(1 + g_E)$$

$$\frac{\ln E_{95} - \ln E_{75}}{20} \approx g_E$$

$$g_E = -5.5\%$$

(d)  $RER = E \cdot \frac{P}{PW}$ , therefore

$$g_{RER} = g_E + g_P - g_{PW}$$

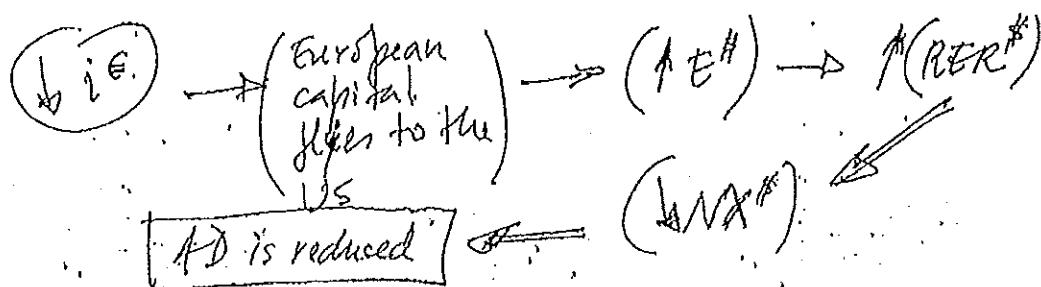
$$= -5.5\% + 5.7\% - 3.6\%$$

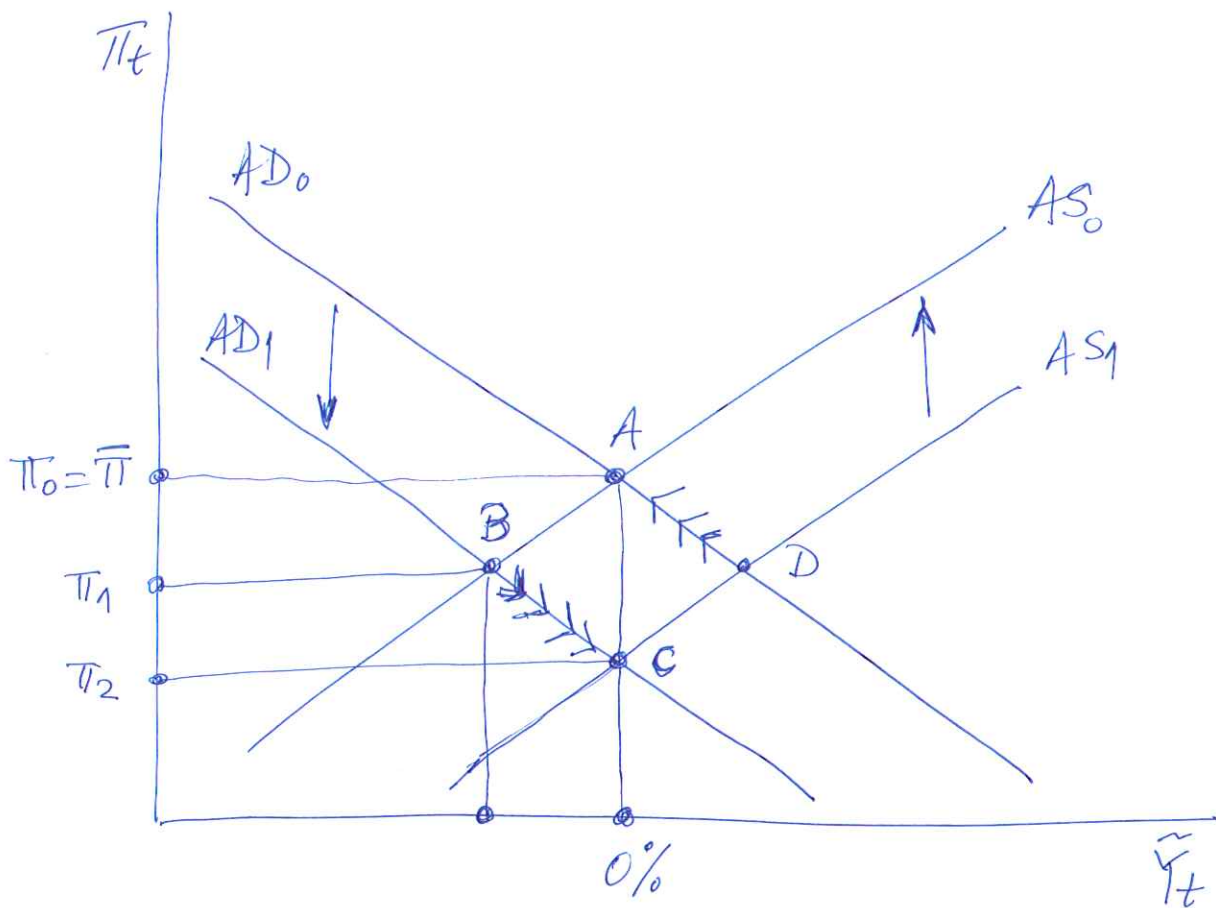
$$= -3.4\%$$

Problem 4 . Solved at the end of chapter 20.

Problem 5

If the ECB reduces short term interest rates, then, this will have an impact upon the US economy because this act will create a pressure for an appreciation of the dollar.





A: initial equilibrium point

B: the result of the impact of an increase in  $E$ . the price of the dollar goes up,  $NX$  goes down, the AD goes down, and the economy moves into B.

At B, the economy is in a recession, and if the Central Bank does not react, according to the AS function we know that inflation will have to come down: the economy moves to point C.

C: Is this point an equilibrium point?

Yes, and no!

Yes, if the Fed accepts  $\pi_2$  as the new target level of inflation. As  $\bar{\pi} = \pi_2$  and  $\tilde{Y}_t = 0\%$ , the economy is in equilibrium.

No, if the Fed does not accept  $\pi_2$  as the new target, and wants  $\pi$  back to  $\bar{\pi}_0$ . Notice that at C  $\pi_2 < \bar{\pi}$ , so in order to have higher inflation there must be some policy measure to expand AD back to  $AD_0$ . There are only two alternatives: (i) the Government increases public spending ( $G_t$ ), or (ii) the Fed reduces short term interest rates ( $i_t$ ). In this second case, lower  $i_t$  will lead to higher  $I_t$  and  $C_t$ , and it will lead also to a lower price of the dollar ( $\downarrow \text{\$}^{\text{US}}$ ) which will lead to higher NX. Therefore AD will increase and this is represented by the movement from  $AD_1$  to  $AD_0$ . The new point is **D**.

D: At point D, the economy is in a boom, and in this case we know that there are pressures to make inflation increasing, and this movement is represented by the arrows from D to A.

Point A is the final equilibrium after the Eurozone having reduced its short term interest rate, and forced the Fed to do the same, in order to fight inflation below its target level.



## Problem 6

Remember the steps we followed when we derived the IS function for the first time.

In this particular case we have to apply a trick, as it is done on page 552 (chapter 20) of the textbook.

If Net Exports is written as

$$\frac{NX_t}{\bar{Y}_t} = \bar{a}_{nx} - \bar{b}_{nx} (R_t - R^w)$$

this can be written in a more useful way just by adding and subtracting  $\bar{r}$  as follows

$$\frac{NX_t}{\bar{Y}_t} = \bar{a}_{nx} - \bar{b}_{nx} (R_t - \bar{r}) + \bar{b}_{nx} (R^w - \bar{r})$$

In this particular exercise we have something extra:  $(-\bar{n} \tilde{Y}_t)$

$$\frac{NX_t}{\tilde{Y}_t} = \bar{a}nx + \bar{b}nx (R_t - \bar{r}) + \bar{b}nx (R^w - \bar{r}) - \bar{n} \tilde{Y}_t$$

So, following the usual steps, we will arrive at the following result

$$\tilde{Y}_t = \bar{a} - \bar{b} (R_t - \bar{r}) - \bar{n} \tilde{Y}_t \quad (1)$$

$$\text{with } \bar{a} = a_c + a_g + a_i + a_{ne} - 1 + \bar{b}nx (R^w - \bar{r})$$
$$\bar{b} = (\bar{b}_i + \bar{b}nx)$$

Solving ~~the~~ equation (1) for  $\tilde{Y}_t$  we get

$$\tilde{Y}_t = \frac{1}{1+n} [\bar{a} - \bar{b} (R_t - \bar{r})]$$

Now the multiplier is lower than 1:  $\frac{1}{1+n} < 1$ .

### Problem 7

Because of the international currency crisis, lots of people are demanding dollars in the exchange markets.

The price of the dollar goes up:  $\uparrow E$

$$\textcircled{\uparrow E^*} \rightarrow \textcircled{\uparrow RER^*} \rightarrow \textcircled{\downarrow NX^*} \rightarrow \textcircled{AD \downarrow}$$

This is very similar to Problem 5. See the figure in that problem.

### Problem 8

Solved at the end of Chapter 20.

### Problem 9

The Triffin dilemma is applied to a small or medium scale economy. The US is a very large economy, and an economy that uses its main currency as one of the most relevant currencies in the world.

## Problem 10

Students are asked to work with some data. Not to be solved in the classroom.

## Problem 11

A very general question with too many possible answers. It depends upon the tastes of each one.