

Solutions (Detailed)

Final Test (Sample)

Macroeconomics

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Group A

1. In order to obtain the IS function we should just follow the usual steps. After the initial steps we should arrive at

$$\frac{Y_t}{\bar{Y}_t} - 1 = 0.7 + 0.15 + 0.05 - 0.06 + 0.16 - 1 - 2(R_t - \bar{r})$$

$$\tilde{Y}_t = 0\% - 2(R_t - \bar{r}). \quad \underline{\text{IS Function}}$$

If $\bar{r} = 4\%$ and $R_t = 3\%$

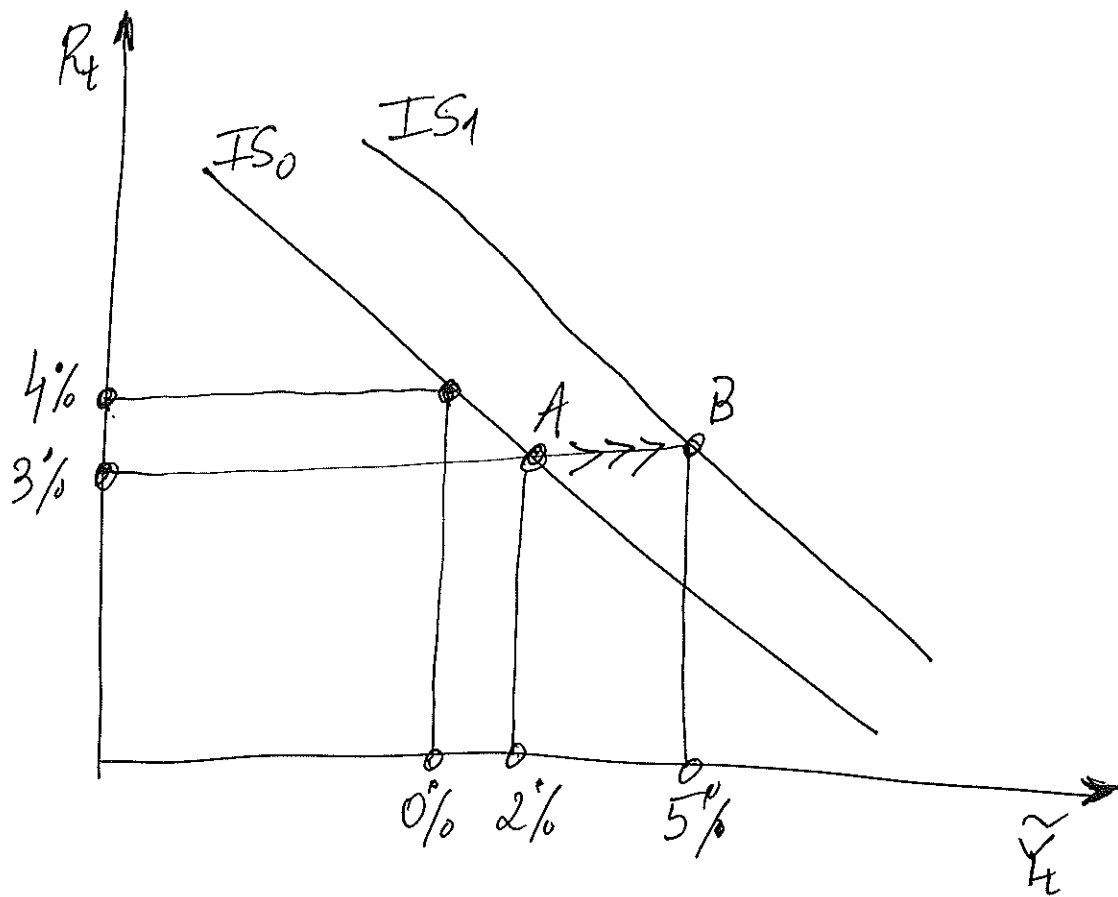
$$\tilde{Y}_t = -2(3\% - 4\%) = +2\% \quad \underline{\text{A small boom}}$$

2. If \bar{a}_g increases by 3 pp, then

$$\tilde{Y}_t = 3\% - 2(3\% - 4\%) = 5\% : \underline{\text{A large boom}}$$

see the graphical representation in the next page.

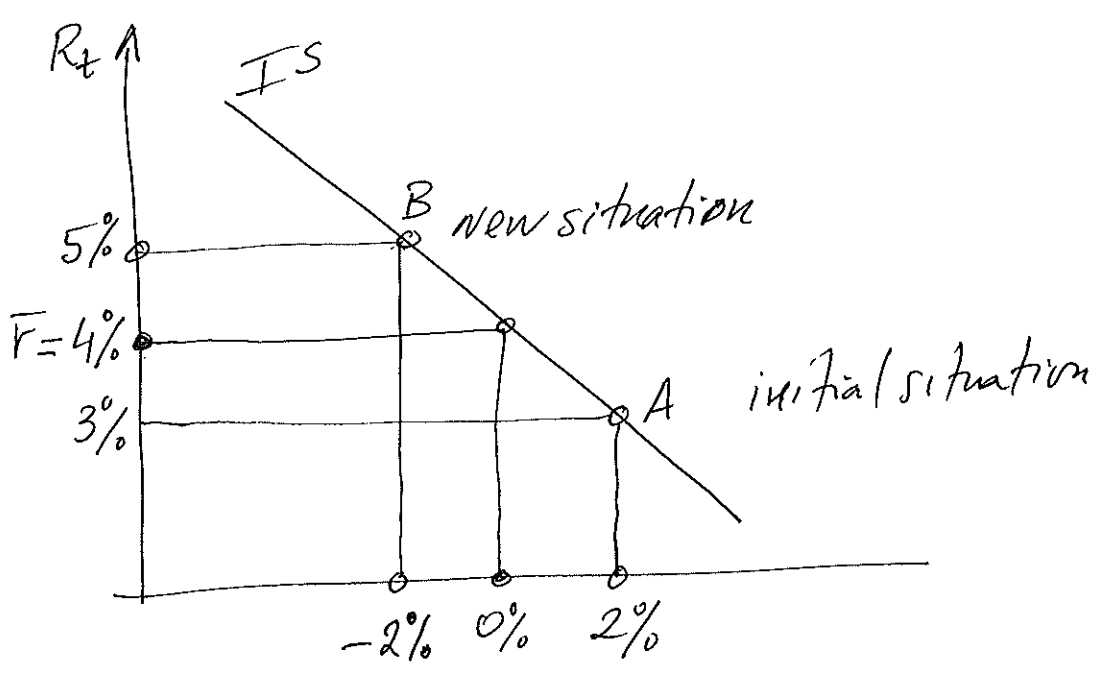
Graphically, this increase can be represented as



3. Taking the initial situation, and having the Central Bank increasing i_t by 2 pp we will have $R_t = i_t - \pi_t \Rightarrow \Delta R_t = \Delta i_t$

$$\tilde{Y}_t = 0\% - 2(5\% - 4\%) = -2\%$$

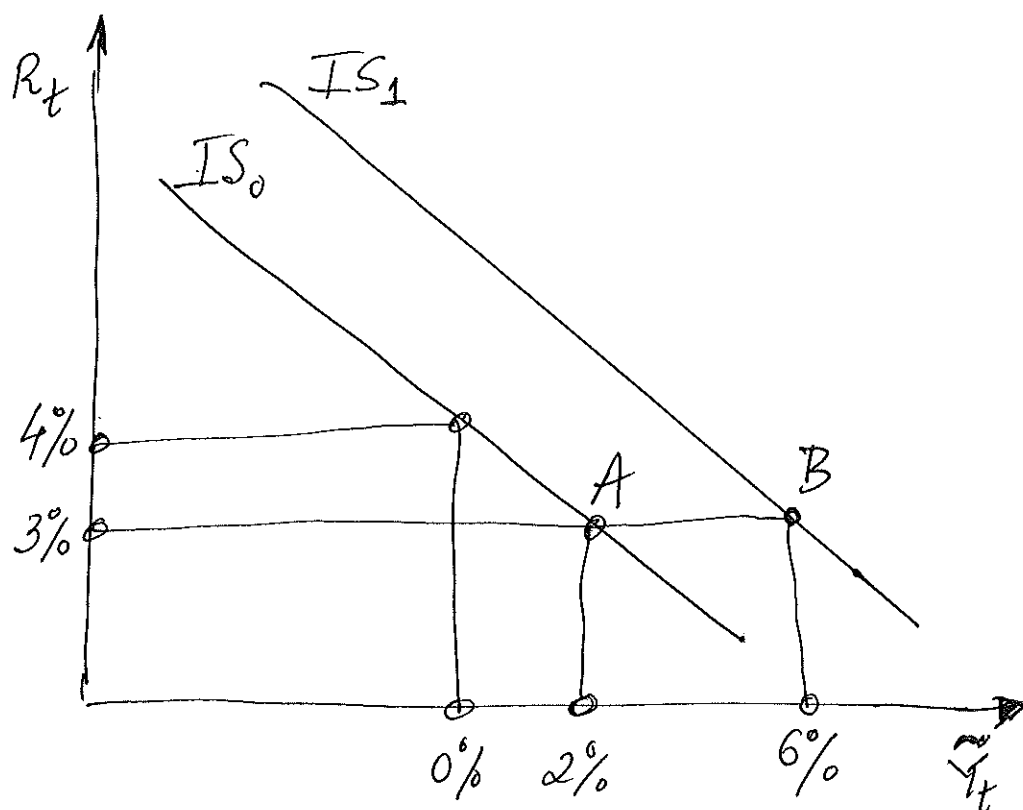
A small recession



4. Now we consider a sharp increase in the marginal productivity of capital: \bar{r} increases

$$4\% \rightarrow 6\%$$

$$\tilde{Y}_t = 0\% - 2(3\% - 6\%) = +6\% \quad \text{large boom}$$



5. With this new Consumption function, the IS function will be different. Following the same steps again, we will get

$$\tilde{Y}_t = \frac{1}{1-0.5} [0\% - 2(R_t - \bar{r})]$$

Considering that in the initial case we have

$$\bar{r} = 4\%, R_t = 3\% \text{ and now } \Delta \bar{a}_g = 3 \text{ pp}$$

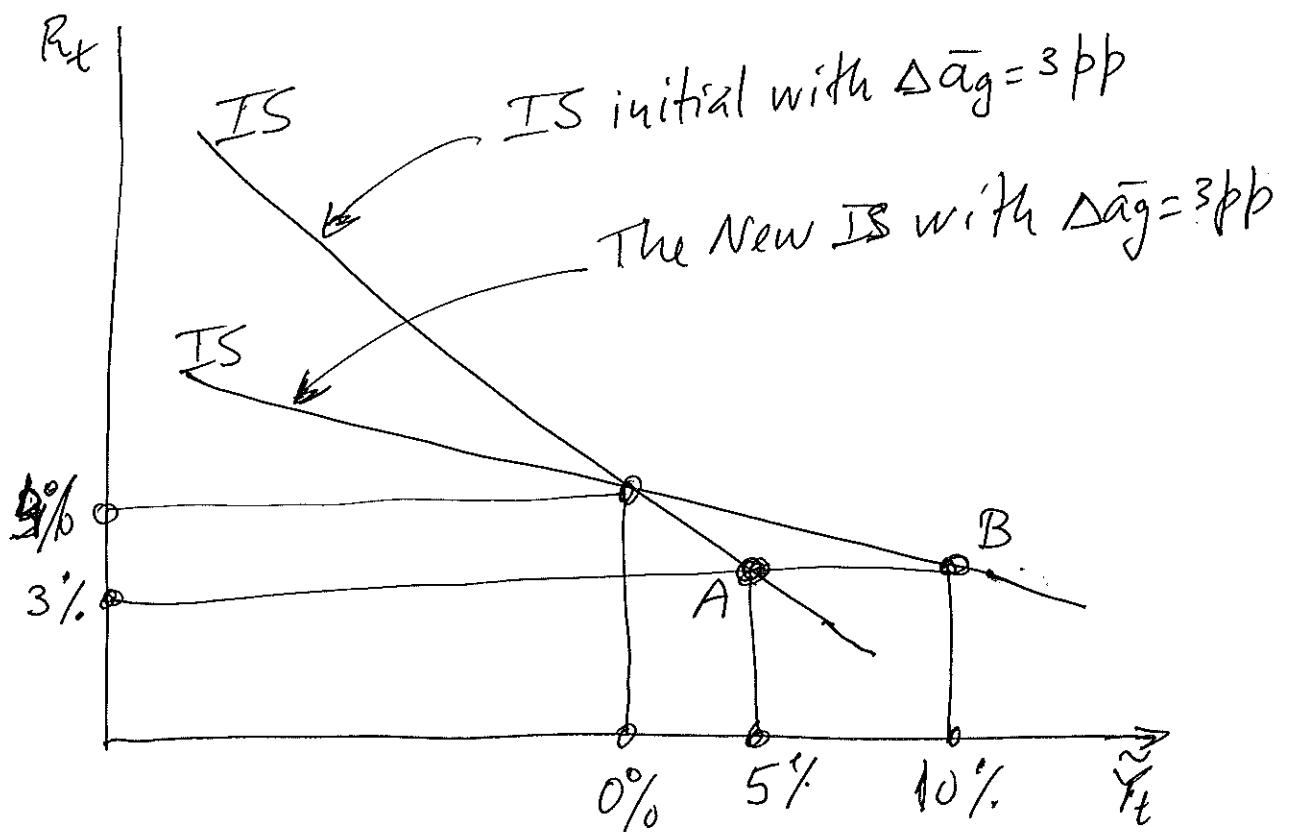
we will have

$$\tilde{Y}_t = \frac{1}{1-0.5} \left[3\% - 2(3\% - 4\%) \right]$$

$$= 10\% : \text{ a huge boom}$$

Because the multiplier is now equal to $\frac{1}{1-0.5} = 2$; while it was equal to 1 in our previous cases, the same increase in public spending will lead to a huge boom.

Graphically we get

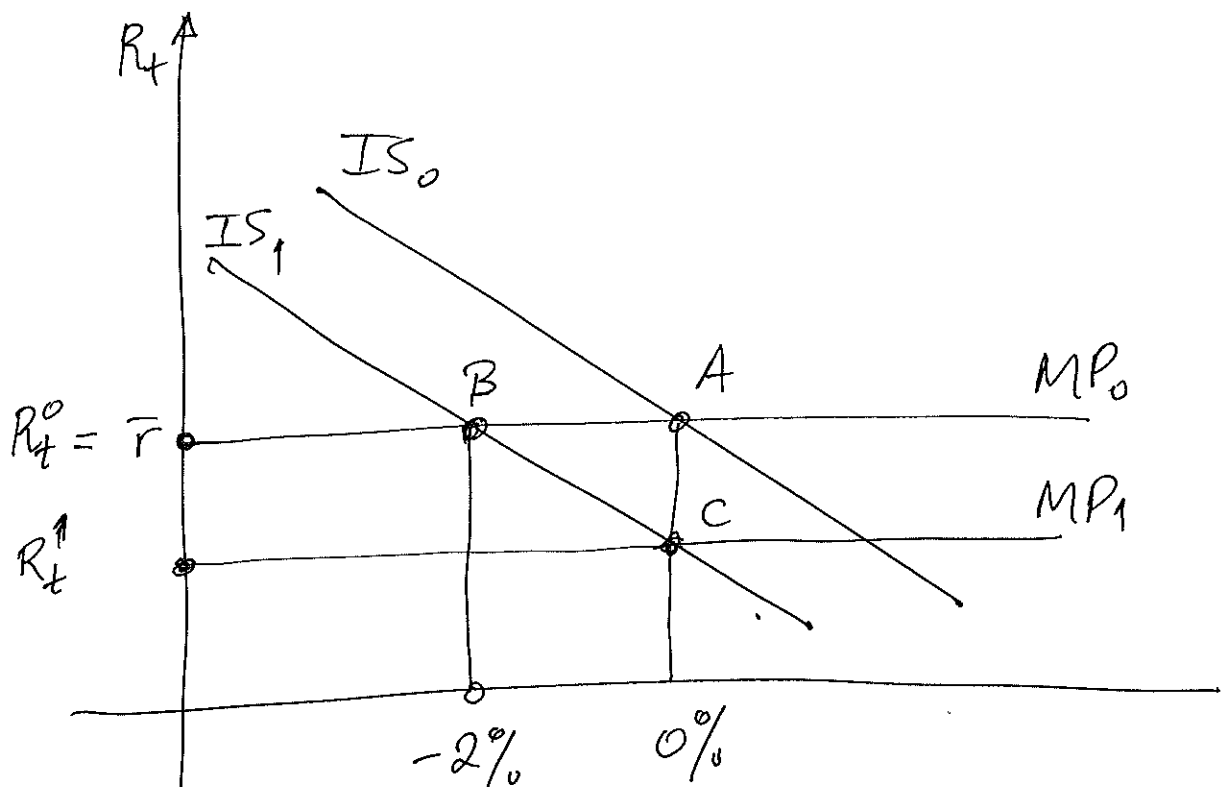


Group B

B1

1 A sharp decline in house prices leads to a sharp decline in AD because \bar{a}_i goes down.

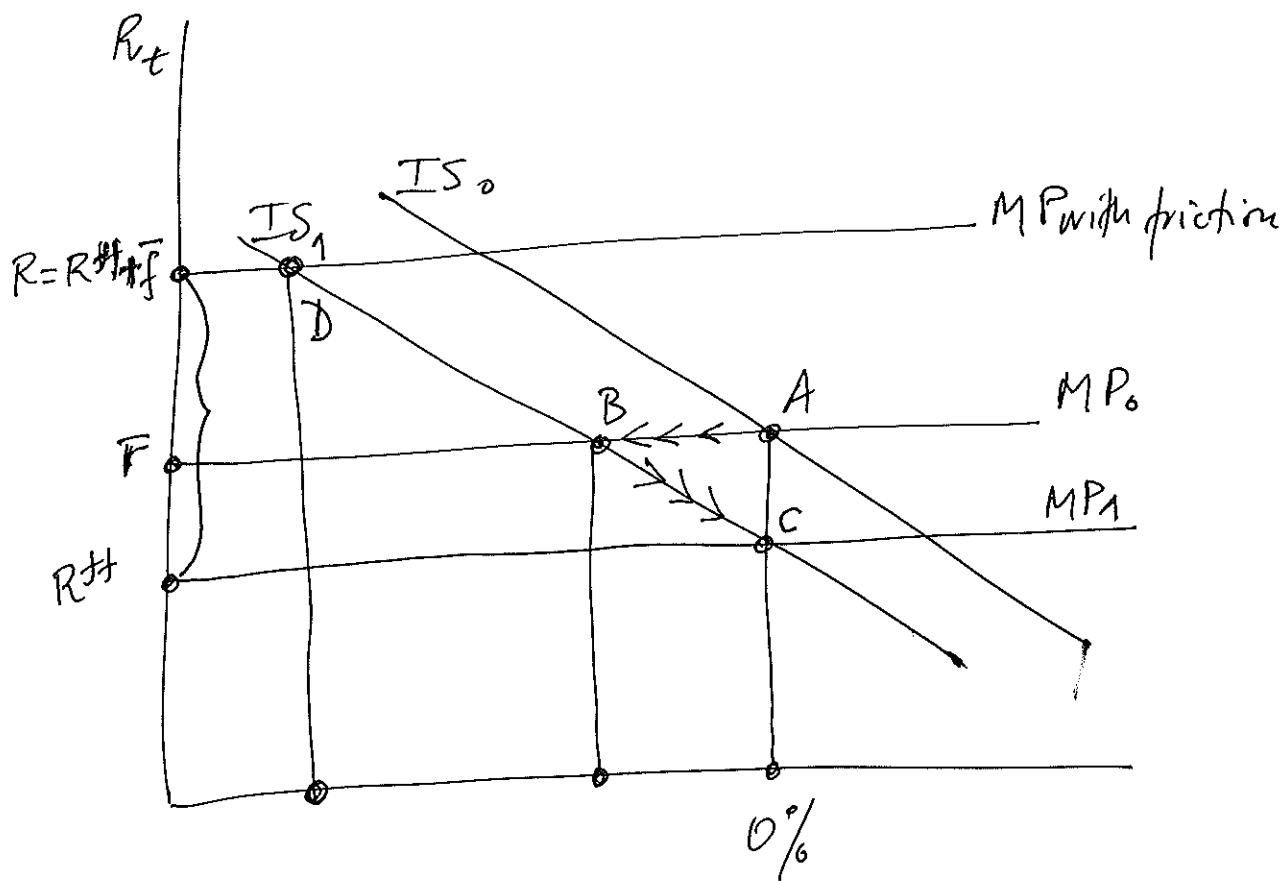
In order to avoid the recession, the Central Bank will reduce the interest rate (i_t) such that the MP curve will force the economy to go back to $\bar{Y}=0$ as in point C below



2. Financial frictions are an economic factor that distorts "normal" interest rates.

Usually, they lead to much higher market real interest rates than those that the central bank wants to see practiced in the money market. Because of high uncertainty and risk, spreads increase dramatically leading to much severe recessions.

3.



As in the question (1) the economy without frictions, would move from A to B, and then to C, when the Central Bank reduces its nominal interest rate. The Central Bank desires to have a real interest rate equal to R^H .

However, because of the large spread that is practiced in the Banking sector, the real interest rate ends up being equal to

$$R_t = R^H + \bar{f}$$

the spread
or the friction

So the Central Bank, if it wants to move the economy to point C, from D will have to reduce nominal interest rates by a large amount.

B₂

1. Total amount of liabilities = 19000
Equity = 1500

2. Reserve requirements = $5\% \times 13000 = 650$
Capital ratio = $10\% \times 20500 = 2050$

this Bank has liquidity problems because

$$650 > 500$$

and has also solvability problems because

$$2050 > 1500$$

3. The leverage ratio is given by

$$\frac{19000}{1500} = 12.66$$

The level of risk this bank has taken is very high, because with one dollar of equity it created liabilities equal to 12.66 dollars.

4. The New Balance Sheet will be

Assets		Liabilities	
Loans	9600	Deposits	13000
Fin. Invest.	8000	Short Run Debt	5000
Cash & Res.	500	Long Term Debt	1000
		Equity	-900
	<hr/> 18100		<hr/> 18100

The bank is bankrupt because it ends up with negative equity. If it does not find very quickly new investors to inject new capital to its balance sheet, it will definitely go bankrupt.

Group C

1. The AD function is obtained as follows:

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

$$R_t = \bar{r} + \bar{m} (\pi_t - \bar{\pi})$$

Therefore we get

$$\tilde{Y}_t = \bar{a} - \bar{b}\bar{m} (\pi_t - \bar{\pi}) . \quad \underline{\text{The AD function}}$$

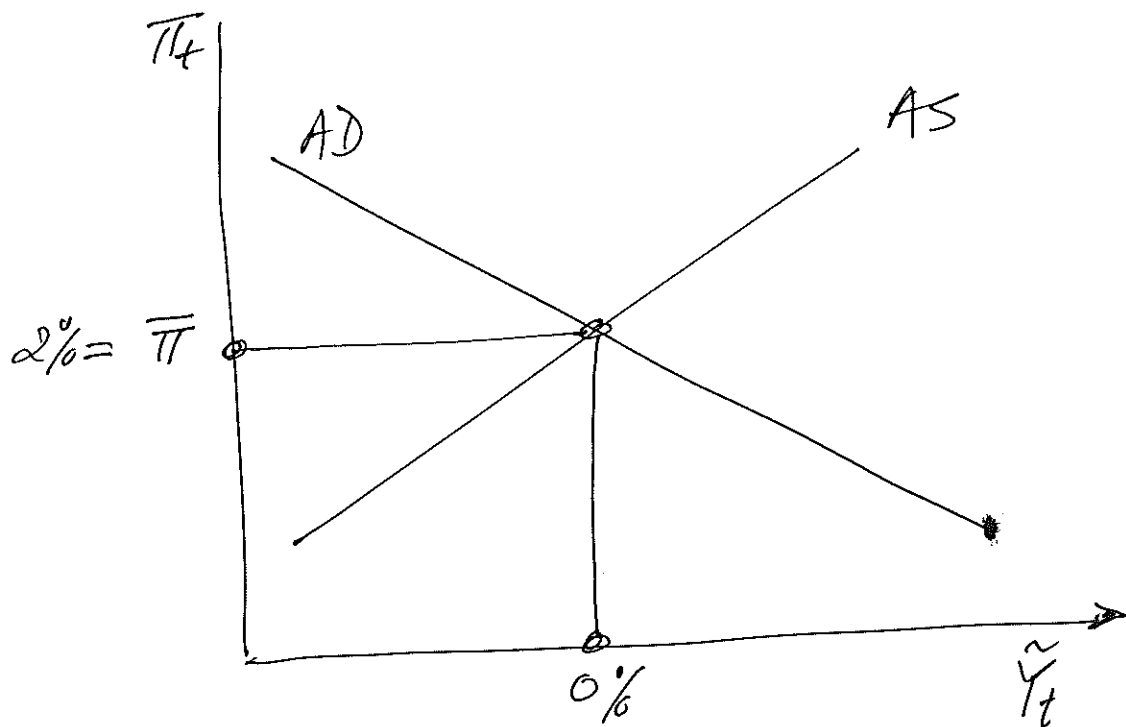
2. $\bar{a} = 0$, $\bar{r} = 3\%$, $\bar{\pi} = 2\%$, $\bar{b} = 0$

The economy will be equilibrium only when

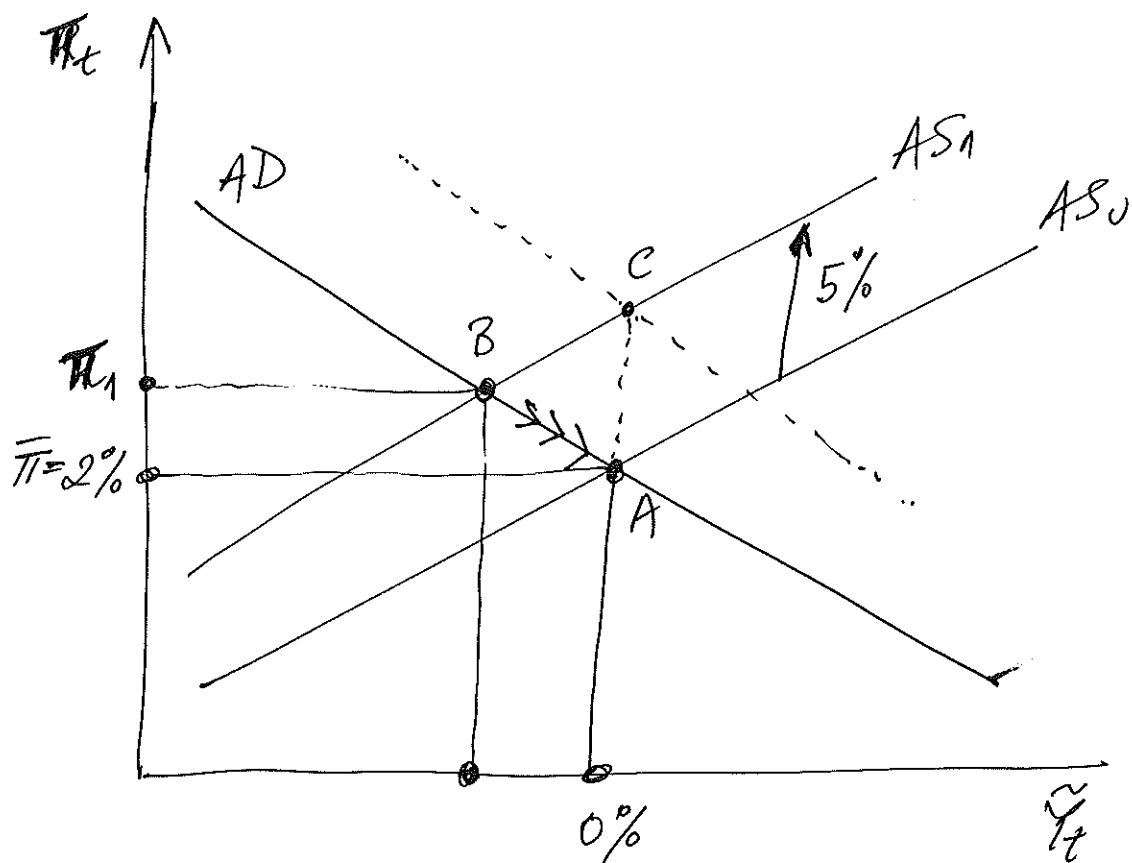
$$\pi_t = \bar{\pi} \Rightarrow \pi_t = 2\%$$

and $\tilde{Y}_t = 0 \Rightarrow R_t = \bar{r} = 3\%$

3. Graphically, the equilibrium will be



4. We will not be able to give a precise value of inflation next period, because we do not have the values for \bar{m} and \bar{b} . We can surely say that the increase in inflation in the next period will be lower than 5%, because the Aggregate Demand is negatively sloped. See next figure for a more clear view of the problem.



Notice that the economy will not move to C (due to a positive shock of 5% in the AS), instead it moves to B. We can not quantify the value of π_1 , because we do not know the values of \bar{m} and \bar{b} (despite knowing \bar{v}).

Nevertheless, point B will not be an equilibrium point because the economy is in recession. The central bank will not react by lowering interest rates, as this move would create even more inflation (think as if lower interest rates would lead to dashed AD curve) at point C.

As the Central Bank does not react, at B the economy is in recession and then inflation will start gradually to go down (the AS curve will shift downwards) until it reaches the initial level of $\pi_t = \bar{\pi} = 2\%$. This process is emphasised by the arrows from B to A.

Group D

D1 . The law of one Price is ~~.....~~ (see slides)

$$E \times P = P^w$$

This law would imply that the nominal exchange rate would be given by the ratio of prices

$$E = \frac{P^w}{P}$$

The nominal exchange rate determined in this way would give us (all against US)

Norway	: 9.8
Euro Area	: 0.826
Japan	: 73.139
Mexico	: 8.455
China	: 3.65
Russia	: 16.7

As we can see from the third column in Table 20.1, these values above differ a lot from those in such column. No empirical

support for this theory.

D2

1 Let's start with the case of R_t .

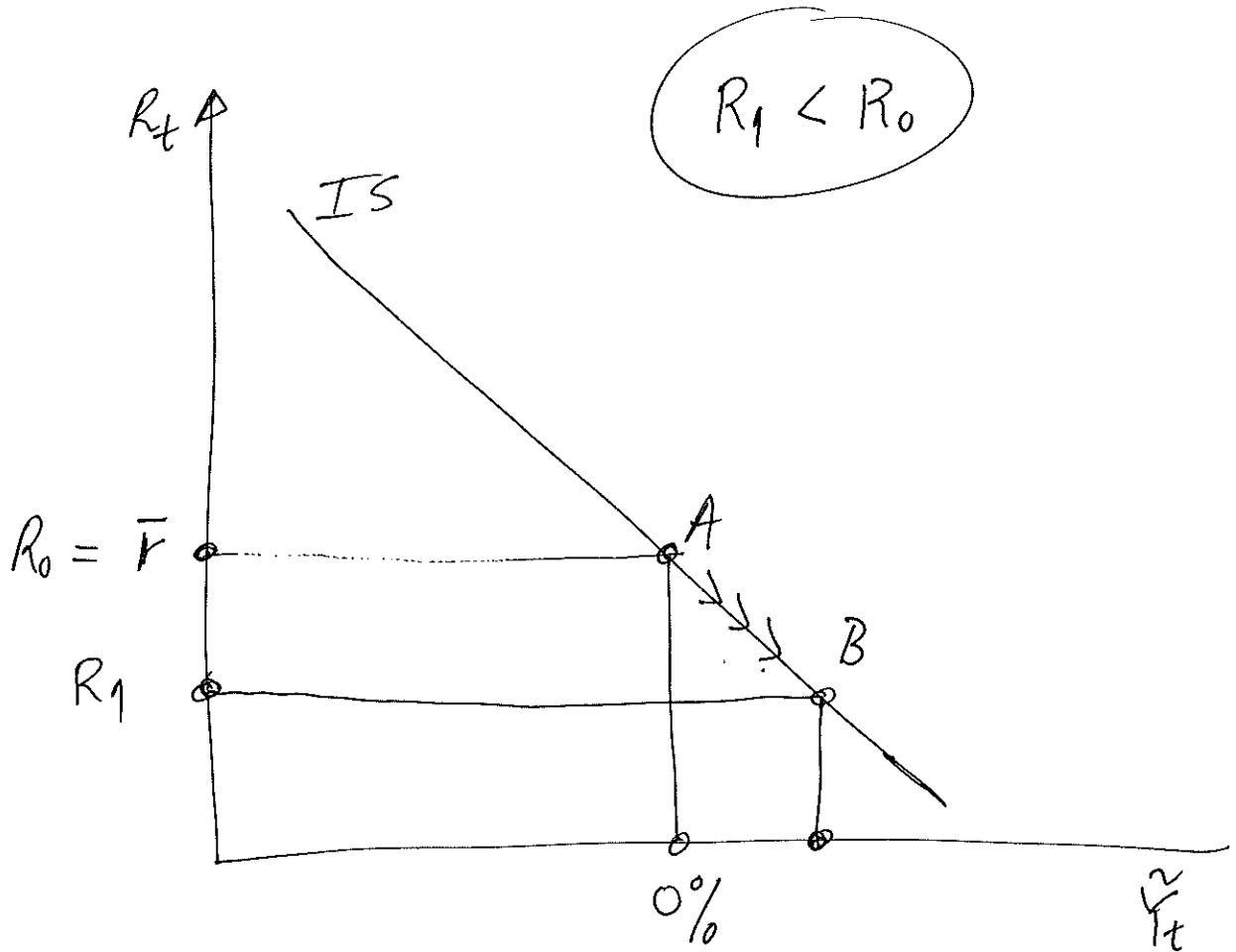
If R_t increases, there will be a large inflow of capital from abroad, leading to an appreciation of the dollar. In turn, this appreciation will lead to higher Real Exchange Rates, which means that US goods and services will become relatively more expensive internationally. The final result will be a decrease in net exports of US goods & services.

Not, let's turn to the case of R^w .

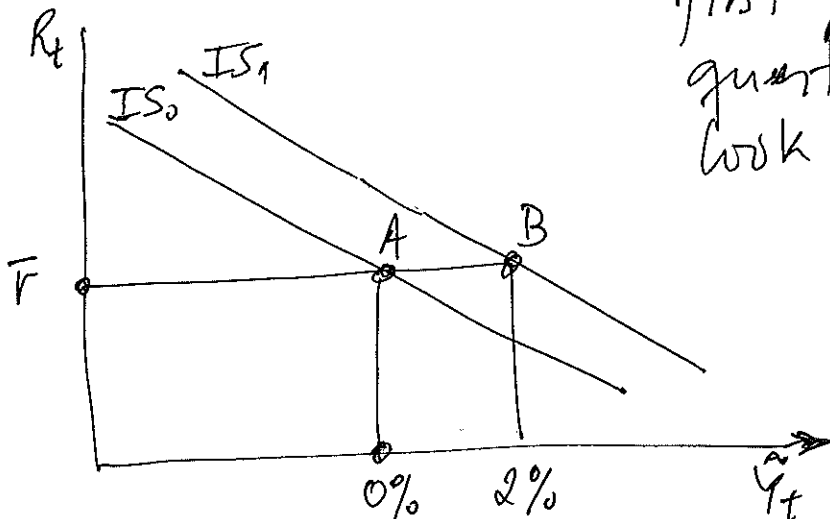
The reasoning is precisely the opposite.

If R^w increases, will be an outflow of US capital, leading to a dollar depreciation, which

2. If the Fed reduces it then



3. The answer is simple, at least in the first part of the question. It will look like this.



The second part of the question is more complicated because we know that the IS curve is flatter when NX depend upon the Exchange Rate. However, because the increase in \bar{a}_g is the same (+2pp) the result will be the same, what changes is the slope of the curves. See below

