

## Multiple choice

Question	Answer
1	a
2	d
3	d
4	a
5	e
6	d

## Exercise 1 – Open economy in the short run

a:

The effect of economic contraction in foreign country on:

Domestic exports:

Domestic exports are affected by  $X(Y^*, \epsilon)$ . When the foreign country experiences a contraction in their economy through lower consumer confidence, this will decrease consumption. As consumption  $C^*$  decreases, demand  $Z^*$  will decrease and then output  $Y^*$  will decrease. When  $Y^*$  decreases, **domestic exports will decrease**.  $Y^* \downarrow \rightarrow X \downarrow$

Output Y:

When domestic exports decrease, the **output Y will decrease** because:  $Y = C + I + G + X - IM$

$\downarrow \rightarrow Y \downarrow$

Consumption and capital investments:

Through the multiplier, the decrease in Y will lead to a **decrease in consumption** and a **decrease in capital investments** because:

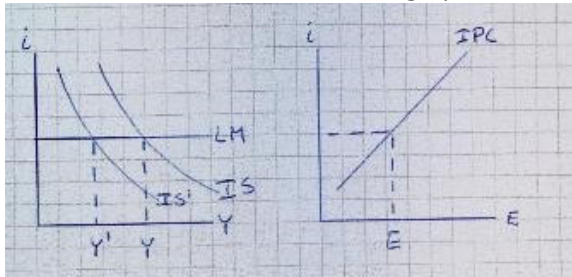
$C(Y - T)$  and  $I(Y, r + x)$

$Y \downarrow \rightarrow C \downarrow \rightarrow I \downarrow$

Interest rate and exchange rate:

Decrease in Y leads to a shift to the left of the IS curve, leaving **interest rate unaffected**. As the interest rate has not changed, the **exchange rate is unaffected**.

Effects shown with IS-LM and IPC graph, IS shifts to IS':



Prices are stable and interest rate does not change, therefore nothing impacts the IPC graph.

b:

Since  $Y^*$  decreased and led to a decrease in  $Y$ , domestic imports will also decrease because:  $IM(Y, \epsilon)$

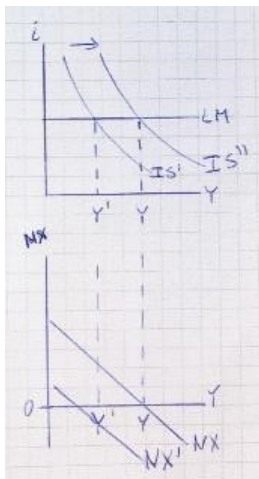
$$Y^* \downarrow \rightarrow Y \downarrow \rightarrow IM \downarrow$$

The decrease in domestic imports was an indirect effect of the decrease in  $Y^*$  and the decrease in domestic exports was a direct effect of the decrease in  $Y^*$ .

This will **affect the trade balance negatively**, as the decrease in domestic exports are higher than the decrease in domestic imports:

$$NX = X - IM$$

c:



The net exports line is downward sloping because:

$$NX = X - IM/\epsilon$$

This means that net exports are negatively correlated with imports, and the slope is also negative:  $-IM/\epsilon$

Since domestic imports decrease less than domestic exports decrease,  $NX$  shifts to the right to  $NX'$

d:

The domestic government could implement an **expansionary fiscal policy**. They could do this by increasing government spending or lowering taxes. This would lead to shift to the right of the IS curve. Bringing output back to its initial level.

Expansionary fiscal policy effect on:

Domestic output:

Increase in government spending or decrease in taxes (or both) leads to an **increase in domestic output**. Increase in government spending leads to a direct increase in  $Y$  and decrease in taxes leads to an indirect increase in  $Y$ :

$$Y = C(Y - T) + I + G$$

Consumption and capital investments:

**Consumption would increase** because taxes decrease, and through the multiplier, consumption would increase because  $Y$  increases:  $C(Y - T)$

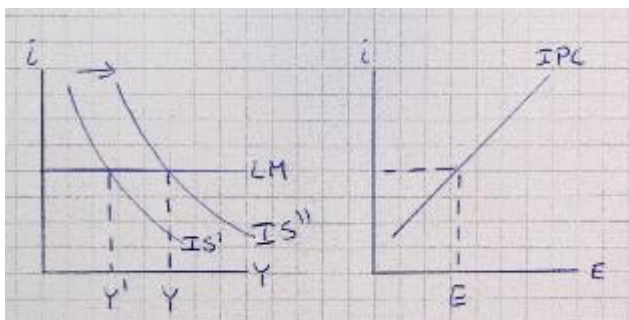
**Capital investments would increase** through the multiplier, because  $Y$  increases:  $I(Y, r + x)$

Interest rate and exchange rate:

**Interest rate would be unaffected**, as it was fiscal policies that was implemented.

**Exchange rate would be unaffected**, as interest rate has not changed and prices are unaffected.

Fiscal policy shifts the IS' curve to IS'' from  $Y'$  to  $Y$  (initial level):



e:

**My answer would not change** if the domestic economy was operating under a fixed exchange rate regime. Because it was the government that should implement policies to get  $Y$  back to initial level, fiscal policies were being used. Under a fixed exchange rate regime this is also allowed. Had the questions however asked me to state what the central bank should implement as policies, my answer would have changed, as monetary policies have different objectives in fixed (maintain  $E$ ) and flexible exchange rate regimes (often primarily maintain  $\pi$ ).

## Exercise 2 – Interest parity condition

a:

The interest parity condition is:

$$1 + i = \frac{E(1 + i^*)}{E^e}$$

If the condition above is respected, it states that the interest you would get as a financial investor in domestic country is equal to the relationship between the interest you would get on foreign currency in relation to what you would expect the exchange rate to be.

1 unit of domestic currency in domestic bond:

$$1 + i$$

1 unit of domestic currency in foreign bond:

$$i^* - \frac{E^e - E}{E}$$

b:

$$1 + i = \frac{E(1 + i^*)}{E^e} \Leftrightarrow 1 + 0.01 = \frac{100(1 + 0.01)}{100}$$

After the change in the domestic interest rate, the interest parity condition will not be respected. Financial investors will have the chance to engage in arbitrage by investing where the interest rate is high in order to receive highest interest at payout. When the nominal exchange rate is lower the financial investors can exploit this and engage in arbitrage in order to make their money worth more. This leads to a decrease in the nominal exchange rate, because a low interest rate is not good for financial investors, they will invest where the interest rate is higher. (But a low interest rate is good for capital investments). Therefore, the financial investors engage in arbitrage to utilize the now lower nominal exchange rate and get more from their money by investing it in the foreign country where it is worth more.

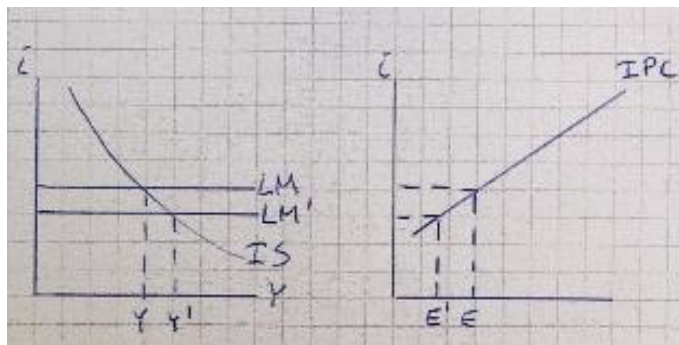
It is important to note that since  $E^e$  remains the same, this factor will not help to get the interest parity condition back to being respected. Normally, expected exchange rate would change over time if financial investors engage in arbitrage.

**There is a change in the nominal exchange rate:**

$$E = \frac{(1 + i)}{(1 + i^*)} * E^e \Leftrightarrow E = \frac{(1 + 0.008)}{(1 + 0.01)} * \overline{100} \Leftrightarrow E = \mathbf{99.802}$$

c:

**Expansionary monetary policy** shifts LM down to LM' and thereby E to E':



The expansionary monetary policy also shows on the IPC graph that **E will decrease**.

The IPC graph is upward sloping because:

$$i = \frac{E(1 + i^*)}{E^e} - 1$$

This tells us that there is a positive correlation between the interest rate and the exchange rate.

Specifically, the slope of the IPC is:

$$\frac{E(1 + i^*)}{E^e}$$

Meaning the relationship between the exchange rate with foreign interest in relation to expected exchange rate is positive.

d:

The interest parity condition can be respected even though the interest rates differ, because E and  $E^e$  is also in the equation. In this example, the Home country could choose to revalue its currency to bring E back to initial level and thereby respect the interest parity condition again.

Another example is if the expected nominal exchange rate differs from the nominal exchange rate, then a difference between the interest rates could actually be used as stabilizers and thereby respecting the interest parity condition.

$$1 + i = \frac{E(1 + i^*)}{E^e}$$

e:

Under a fixed exchange rate regime, the central bank is only allowed to use monetary policy in order to keep the nominal exchange rate at the fixed level. Since the central bank in Home country implemented expansionary monetary policy that resulted in the nominal exchange rate to change, this **would not be allowed** under a fixed exchange rate regime.

However, if the Foreign country had changed  $i^*$ , then Home country would be allowed to use monetary policy to change  $i$  because the purpose would be to maintain  $E$ .

### Exercise 3 – High inflation

a:

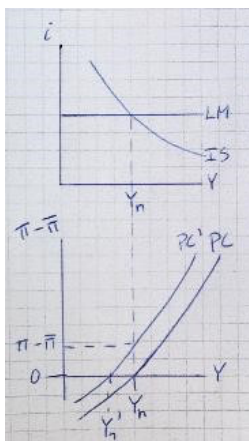
An increase in energy prices captured by an increase in  $m$  will lead to a shift down of the price setting curve. This increases level of natural rate of unemployment, but **the unemployment rate does NOT change**. No change in the actual unemployment rate, means there is **no change in output  $Y$**  because demand  $Z$  is the same.

No change in  $Y$  has led to an **increase in output gap**, because output is higher than natural level of output:  $Y > Y_n$

An increase in  $m$  means higher marginal costs for the firms which leads to an increase in prices. An increase in prices leads to **increase in inflation rate**.

The **interest rate has not changed**.

b:



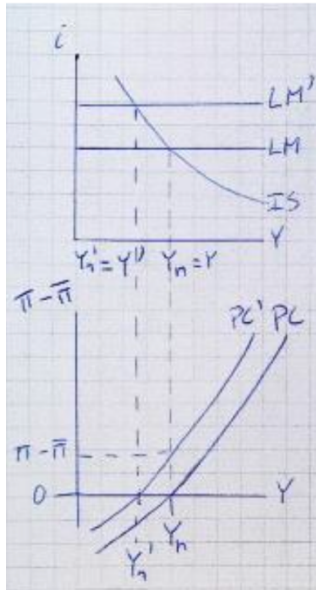
Increase in energy prices =  $m \uparrow$

PS shifts up and creates new natural level of output.

c:

The central bank is expected to implement a **contractionary monetary policy** and **increasing the interest rate**. Increase in interest rate will increase borrowing rate which will decrease capital investments. A decrease in investments will lead to a decrease in demand  $Z$  and thereby a **decrease in output  $Y$** . Now  $Y' = Y_n'$  and there is **no output gap**. No output gap leads to **decrease in the inflation rate** that is now equal to target  $\pi = \pi^e = \bar{\pi}$ . The decrease in  $Y$  will lead to an **increase in the unemployment rate (Okun's law)**.

d:



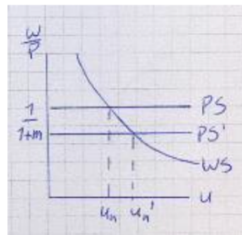
LM shifts up to LM' ( $i$  increases)

$Y$  decreases to  $Y'$

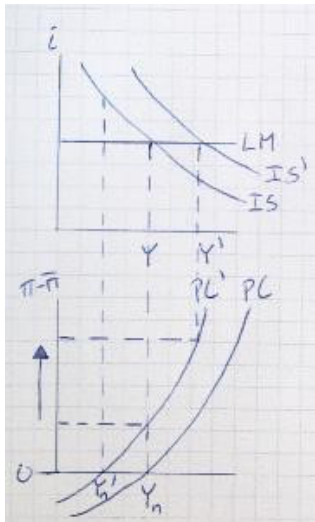
$Y' = Y_n'$

$\pi = \bar{\pi} = \pi^e$

$u' = u_n'$  ( $u_n' > u_n$ ) – this can be seen in the price- and wage setting relation:



e:



Expansionary fiscal policy would lead to a shift to the right of the IS curve to  $IS'$ . **Y would increase** to  $Y'$ .

$Y' > Y_n$  and the output gap would **increase the inflation rate** even more.

The **interest rate would not change** in expansionary fiscal policy.

The ECB says that expansionary fiscal policies should not happen because it would only lead to higher inflation. Instead, a contractionary fiscal policy could help bring the inflation rate down.