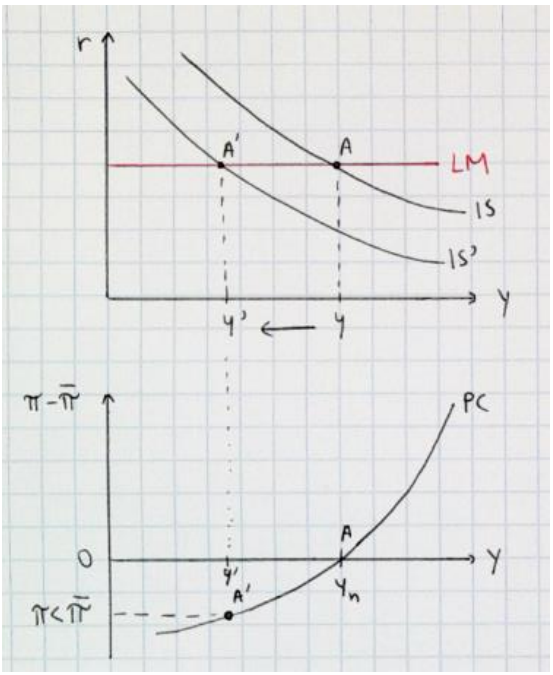
Multiple choice questions:

1	D
2	A
3	E
4	E
5	B
6	E

Exercise 1:

Fixed exchange rate regime in medium run

a)



Output decreases below potential, creating a negative output gap and thus bringing inflation below target. IS shifts leftward; we move along the LM curve and the PC curve down/to the left.

b)

Monetary policy cannot be implemented because of the fixed exchange rate regime. The currency is pegged to another currency at a fixed exchange rate and the interest parity condition must be respected. This implies that the interest rate is fixed, and the current exchange rate and future expected exchange rate are equal. The CB therefore cannot step in to stabilize inflation and monetary policy is ineffective.

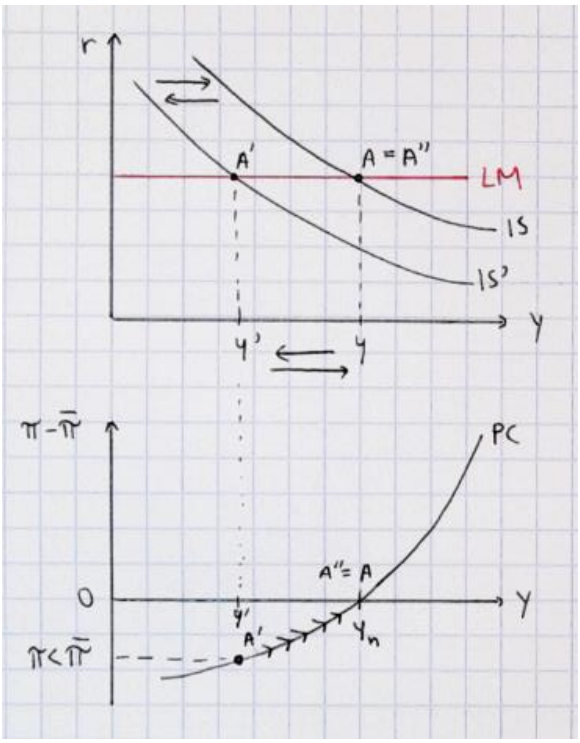
$$i = i^* - \frac{E^e - E}{E} \Leftrightarrow i = i^*$$

c)

This means that there has been downward pressure on the exchange rate, causing investors to demand higher interest rates – which is not viable in a fixed exchange rate regime. If the new peg is credible, the exchange rate and expected exchange rate will be equal after the devaluation. The domestic interest rate and foreign interest rate are the same/equal, due to the exchange rate being fixed at a new peg.

The new, lower fixed exchange rate makes domestic goods cheaper relative to foreign goods and increases demand for domestic goods. This increases net exports due to higher exports (all else equal), overall having a positive effect on the trade balance. This increases demand, which increases output, which through the multiplier effect increases consumption and capital investment whilst causing a slight decrease in net exports (but a smaller effect than the increase in NX) → meaning that **output increases**. This has the potential to shift output back to initial level, bringing the domestic economy back to potential and bringing inflation back up to target.

IS shifts to the right back to initial level; we move along the LM curve as interest rate is unaffected. Rightward/upward movement along the PC back to medium run equilibrium.



d)

The interest parity condition indicates that the returns on domestic bonds should be equal to returns from investing in foreign bonds. Essentially, this should make investors indifferent to investing in domestic versus foreign bonds – but in arbitrage opportunities, where the return on one currency is higher than the other, that makes it attractive for investors to invest where they would earn the highest return. Thereby increasing the demand for that currency until the interest parity condition self-corrects and once again holds.

If $\bar{E} = E^e$, then:

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

Meaning that if the new peg is credible, the domestic interest rate **cannot** differ from the foreign interest rate.

e)

If the expected exchange rate decreases below the new level of the fixed exchange rate, this creates a downward pressure on the exchange rate. This fear of devaluation causes investors to demand higher interest rates to compensate for the increased risk in investing in domestic bonds.

Looking at the interest parity condition:

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

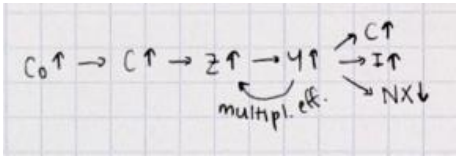
If $E^e \downarrow < E$, then the domestic interest must certainly increase for the interest parity condition to be respected. It is therefore possible for the domestic interest rate to differ from the foreign interest rate. Although this does not align with a fixed exchange rate regime, either the domestic economy must turn things around to convince investors to raise their expectations, or risk yet another devaluation.

Exercise 2:

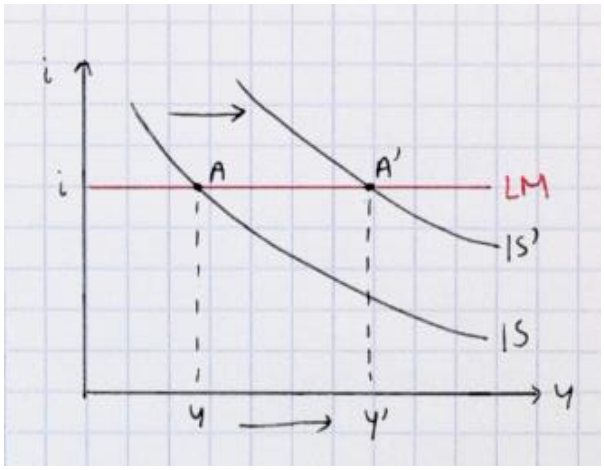
Open economy in short run

a)

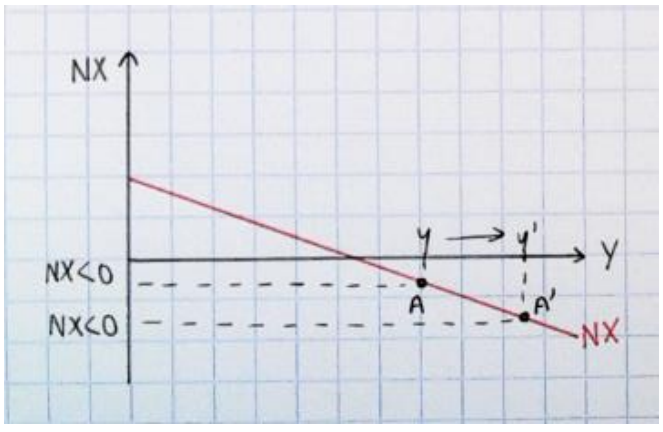
The increase in consumer confidence increases consumption, which increases demand, which increases output. Through the multiplier effect, this causes capital investments to increase, as well as further increases in consumption. The increase in output/income also causes imports to increase, further decreasing net exports – but overall, output increases.



The IS curve shifts to the right; we move along the LM curve. Output goes up.



b)

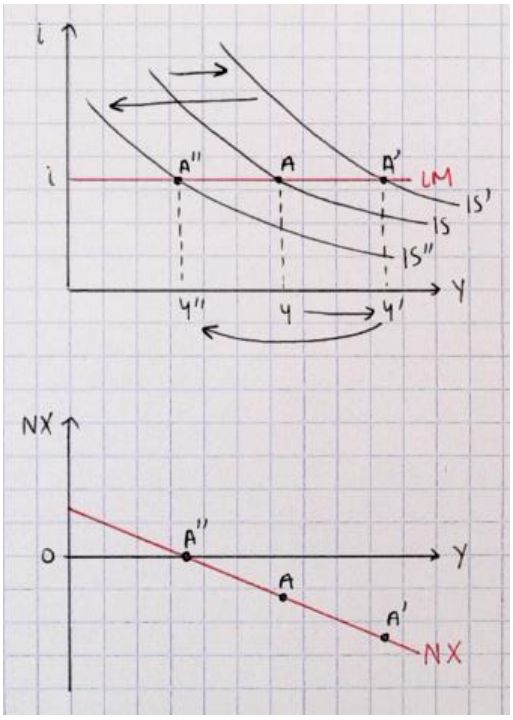


As seen in the graph, there is a negative relation between output/income and net exports. As consumer confidence increases, consumption increases, demand increases, output increases, etc. (as described in a)). As output increases, more of income "leaks" out and goes towards foreign goods, i.e. import increases. Exports do not increase (all else equal). Therefore, the increase in c_0 leads to a further deterioration of the trade balance – running an even bigger trade deficit.

c)

The government should implement a contractionary fiscal policy; that is, decrease public spending G (as taxes are not mentioned as a possibility here).

As government spending decreases, demand decreases, hence decreasing output. This causes capital investments, consumption, and imports to decrease (multiplier effect), **increasing** net imports, thus further decreasing demand and output until net exports are brought to zero.



IS shifts left; more than initially, and outputs are lower than in initial equilibrium. We move along the LM curve and move upwards to the left along the NX line to zero, showing a decrease in imports and no change in exports (all else equal), causing an overall positive effect on the trade balance.

d)

The multiplier in an open economy is smaller than the multiplier in a closed economy. This is due to the introduction of cross-border trade, where a portion of domestic income will go towards a demand for foreign goods, thus increasing imports and decreasing net exports. As net exports is a determinant of GDP in open economy and is negatively correlated with GDP, any increase in NX would certainly lead to a decrease in output. In the multiplier, we now also have the marginal propensity to import, or m_1, which causes the multiplier to be smaller than in closed economy.

The logic behind this is intuitive: as income increases, the demand for foreign goods also increases, essentially “leaking” some of the income away from the domestic economy and into the foreign economy – subtracting away from GDP.

Therefore, the channels through which the multiplier on government spending operates in open economy include not only demand, output, and through the multiplier effect consumption and

investment, but also net exports. This is one more channel than in closed economy, which affects output negatively.

The impact of a change in government spending on output is therefore smaller, as a portion of this public spending will go towards foreign goods, causing imports to increase and net exports to decrease – thus decreasing output as opposed to the effect in closed economy (where government spending only affects the domestic economy, not any foreign economies).

Exercise 3:

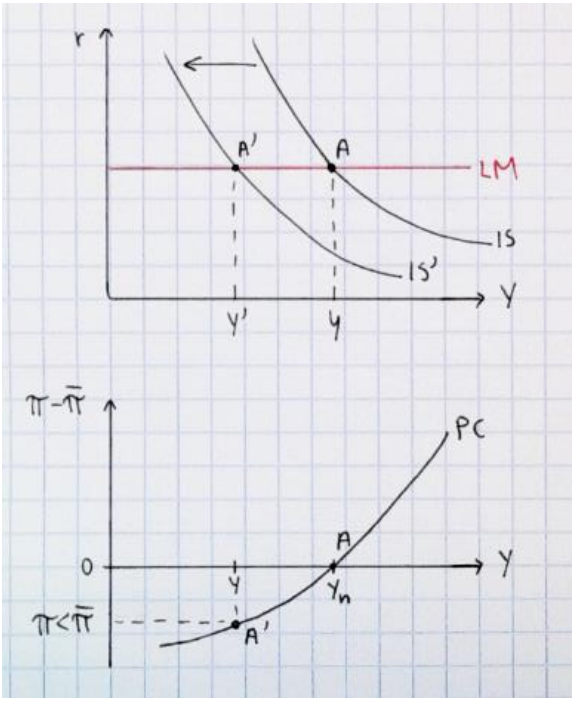
Risk premium and inflation

a)

$$r = i - \pi^e = 3\% - 2\% = 1\%, \qquad r + x = 2\%, \qquad r + x' = 3\%$$

The increase in the risk premium increases the borrowing rate from 2% to 3%, making it more expensive for firms to borrow. This decreases capital investments, which decreases demand and causes output to decrease. As output decreases, consumption goes down and capital investment decreases further (multiplier effect), decreasing demand and output. Output is now below potential, creating a negative output gap. This decreases employment, increasing unemployment (Okun's law), which causes workers to have less bargaining power, pushing wages and prices down, thus lowering inflation below target. Potential output is unaffected, and nominal policy rate is unaffected.

b)

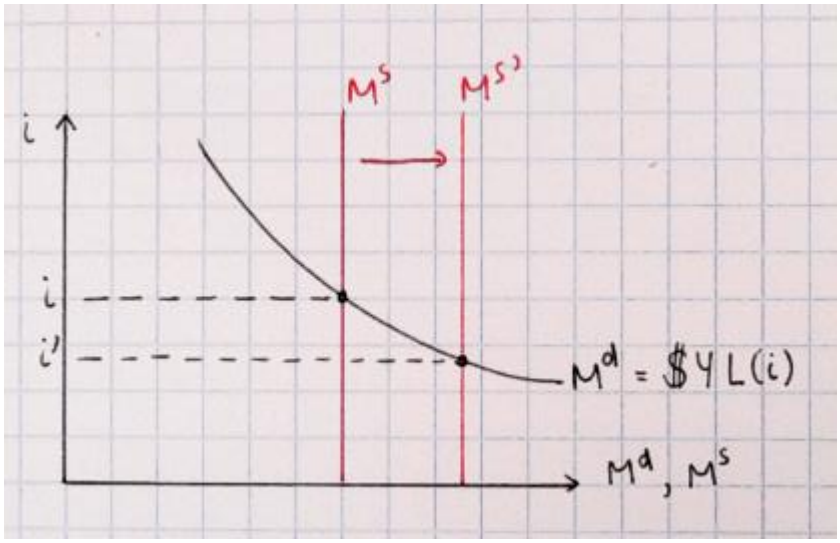


The IS curve shifts to the left; we move along the LM curve to the new level of output. We move along the PC curve downwards and to the left, with output below potential and inflation below target.

c)

The CB's main goal/one of its main goals is stabilizing inflation and bringing it back to target. We expect it to implement an expansionary monetary policy to bring output back to potential and return inflation to target. Nominal policy rates are lowered, thus lowering real interest rates, decreasing the borrowing rate. This increases capital investments, which increases demand and output. As output increases, consumption increases and investments increase further through the multiplier effect – increasing demand and output. This increases employment, decreasing unemployment, increasing workers' bargaining power, pushing nominal wages and prices up, hence increasing inflation (back to target).

The CB increases money supply by buying bonds, which decreases nominal interest rates. This is done to increase money demand and offset the effect of an increase in the risk premium decreasing capital investments.



d)

For $x = 1\%$:

$$i = 3\%, \qquad r = 1\%, \qquad r + x = 1\% + 1\% = 2\%$$

For $x = 2\%$:

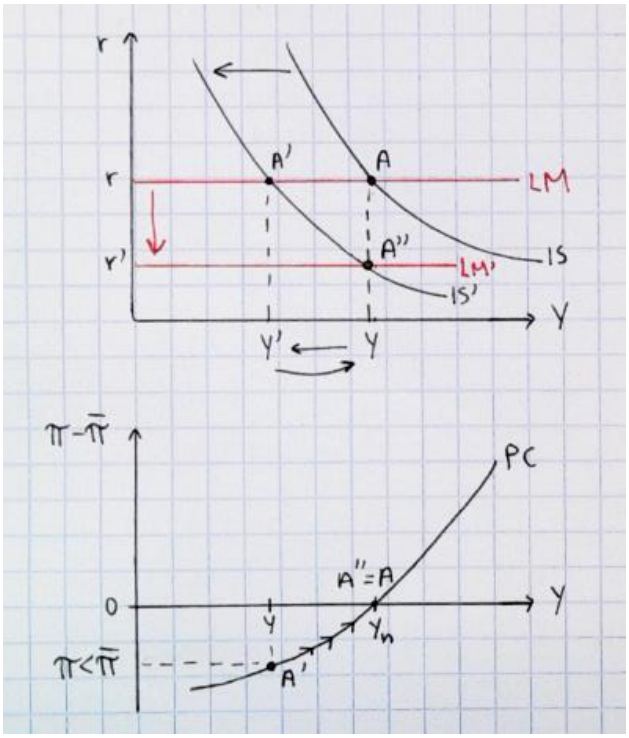
$$i = 3\%, \qquad r = 3\% - 2\% = 1\%, \qquad r + x = 1\% + 2\% = 3\%$$

Therefore, to get output back to potential, the borrowing rate must be reduced back to 2%. As the risk premium has increased to 2%, this means the real interest rate must fall to 0%. Thus, the new nominal policy rate is:

$$i = r + \pi^e = 0\% + 2\% = 2\%$$

The CB must lower the nominal policy rate from 3% to 2% in order to close the output gap and bring inflation up to target.

The decrease in policy rate decreases real interest rates, lowering borrowing rates and increasing capital investments, which increases demand and output. As output increases, investments and consumption increase (multiplier effect), further increasing demand and output – and closing the negative output gap. As output is brought back to potential, employment increases, decreasing unemployment, giving workers more bargaining power, pushing wages and prices up, and increasing inflation back to target. Potential output is unaffected.



The LM curve shifts down from 1% to 0% in real interest rate, and we move along the IS' curve down and to the right (A''). We move along the PC up and to the right, back to medium run equilibrium.

e)

Yes. The borrowing rate must be 2% for output to increase back to potential and for inflation to be brought back to target. The increase in the risk premium from 2% to 3% means that the real interest rate must decrease by 1: $r = -1\%$. The nominal policy rate is therefore also lowered to

$$i = -1\% + 2\% = 1\%$$

As the nominal policy rate is above zero, the CB experiences no problems with the zero lower bound and can manage to bring inflation to the targeted inflation rate.