Macroeconomics Exam

Multiple choice questions

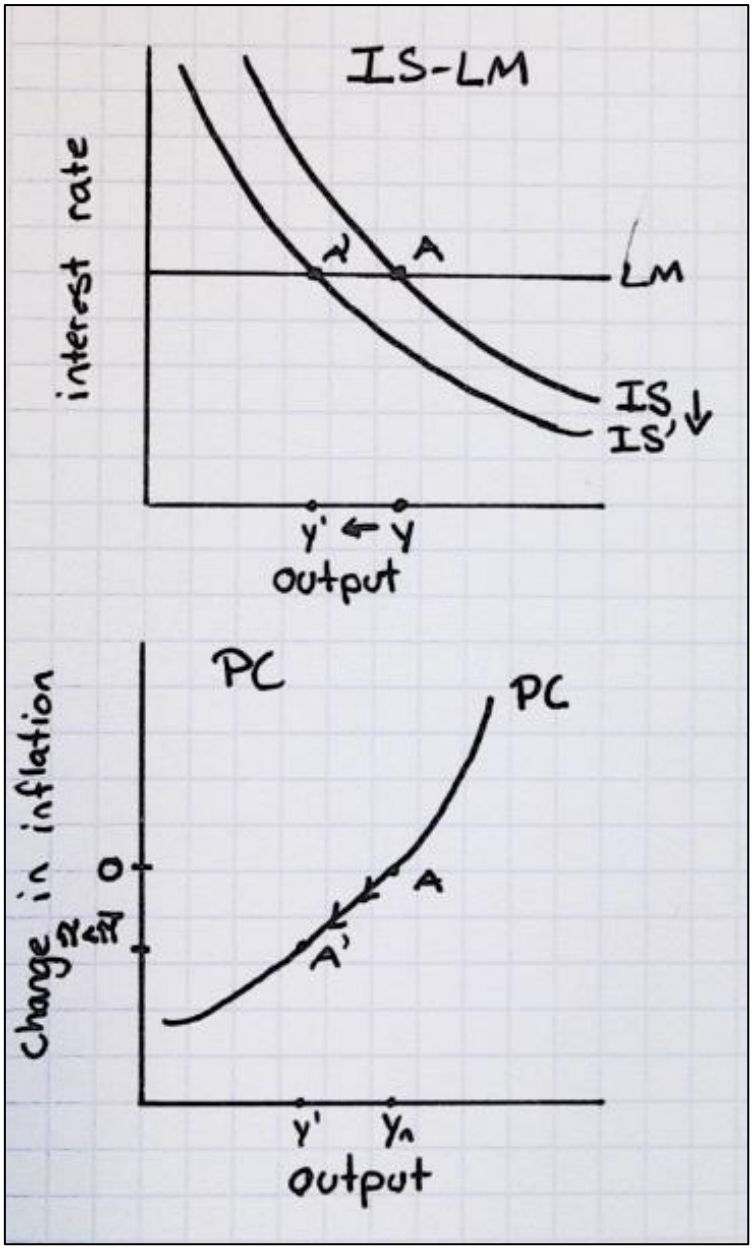
Question	Answer
1	d
2	a
3	e
4	e
5	b
6	e

Exercise 1 – Fixed exchange rate regime in the medium-run

a. In the medium run, the economy will be in equilibrium at the natural level of output, which is the initial equilibrium marked as point A.

Due to the decrease in output, the IS curve shifts leftwards from IS to IS' in the IS-LM model. The severe recission creates a new equilibrium in point A', where output moves from Y to Y'.

The change in equilibrium is shown on the PC graph, where the initial equilibrium is at point A, and after the recession, the equilibrium is at point A'. Due to lowered output, employment has decreased, and unemployment has increased. This decreases the nominal wages and prices, which decreases inflation, so inflation is under target, which creates a movement downwards along the PC curve to its output under potential. The output gap is therefore negative and is shown by the distance between Y_n and Y' on the PC curve.



b. Monetary policy cannot be implemented to bring output back to its natural level, because the economy is operating under a fixed exchange rate regime.

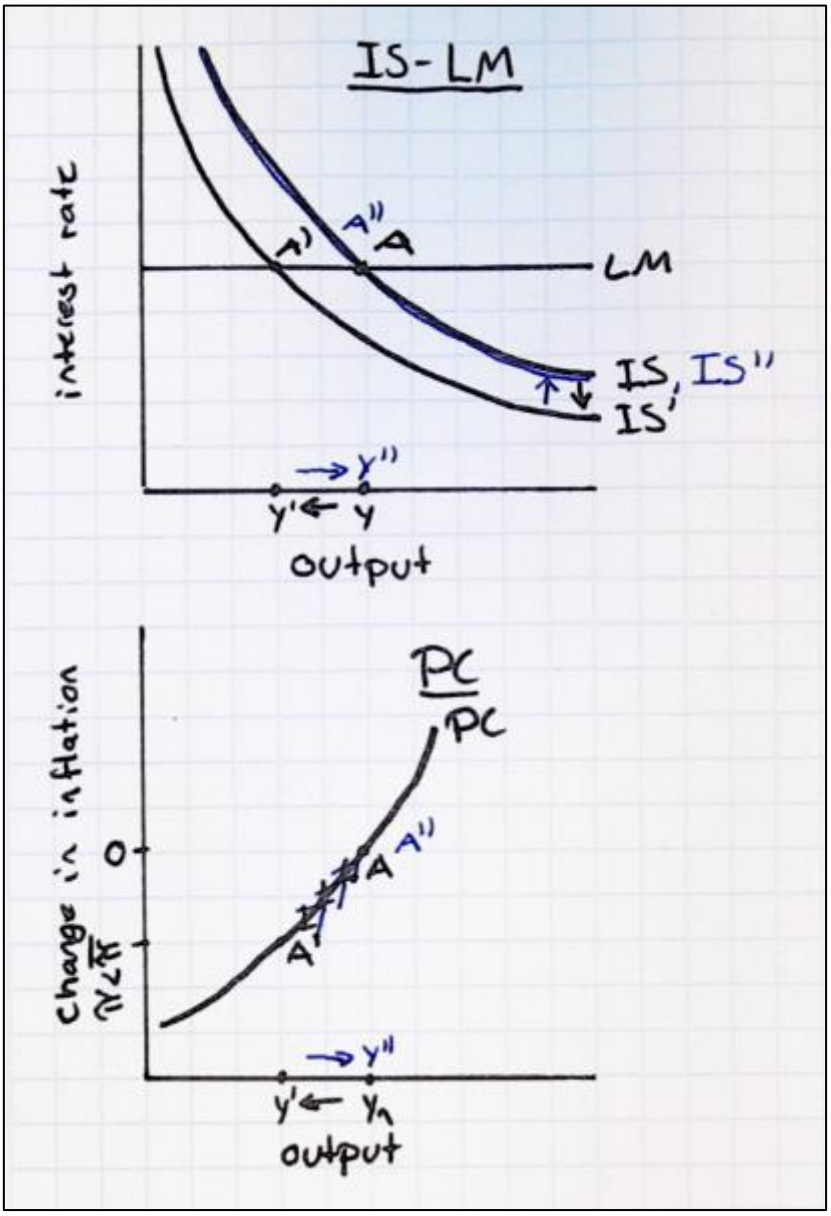
Under a flexible exchange rate regime, both expansionary monetary and fiscal policy can be implemented to fight back a recession, but in a fixed exchange rate regime, the interest rate is pegged at a level, which implies that monetary policy is not a tool the economy can use for adjusting output. The economy can still use expansionary fiscal policy, and in severe cases make a one-time devaluation.

c. Due to the severity of the recession, expansionary fiscal policy would result in unsustainable public debt, and the aim for a government is always to have as low a debt-to-GDP ratio as possible, because a high debt-to-GDP ratio can be a key indicator of increased default risk for

a country. The economy therefore chooses to make a one-time devaluation, which makes financial investors adjust their expectation about the future exchange rate to match the new level of the fixed exchange rate.

As stated in the Marshall-Lerner condition, a one-time devaluation will increase net exports, which will increase demand and output, which increases both consumption, capital investment, and net exports through the multiplier, which again increases output. This is a shift rightwards of the IS curve to IS'', which is placed at the initial IS curve, IS. Output is now back at its initial equilibrium, so the new equilibrium A'' is at point A. This also brings output back to its initial level, so Y'' is at the same level as Y.

With higher output, employment has increased, and unemployment has decreased. This implies higher nominal wages and prices, which increases inflation. This creates a movement upwards along the PC curve from A' to A'', so inflation is back at target, and output is back at its initial point, $Y'' = Y_n$.



d. The interest parity condition states:

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

This implies that the exchange rate, in flexible exchange rate economies, will adjust itself. If the exchange rate decreases, then there will be a higher pressure on the currency, which initially will bring the exchange rate back to its initial.

When rewritten as:

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

…the interest parity condition states that expected returns on domestic bonds is $1+i$ per unit, and on foreign bonds it is $\frac{E(1+i^*)}{E^e}$ per unit. This is important, because if expected returns were higher in one country, then nobody would buy bonds in the country with lower returns.

If the expected exchange rate is aligned with the new value of the fixed exchange rate, E and E^e would be equal to each other. In the first formula stated for the interest parity condition, it becomes clear that $\frac{1+i}{1+i^*}$ then must be equal to 1 for the condition to hold. It will only be equal to 1, if both foreign and domestic interest rate is equal to each other, and therefore the domestic interest rate cannot differ from the foreign interest rate, if the expected exchange rate is aligned with the fixed exchange rate.

e. If the expected exchange rate were to decrease below the new level of the fixed exchange rate, then $\frac{1+i}{1+i^*}$ must be bigger than 1 for the interest parity condition to hold. This forces the domestic interest rate to become higher than the foreign interest rate.

With an increased interest rate, capital investments will decrease, and as a result both demand and output will decrease. Through the multiplier, investment decreases further, consumption, and net exports also decreases, which results in an even bigger decrease in output. This is a leftwards shift of the IS curve, and the movement is similar to the one drawn in question a.

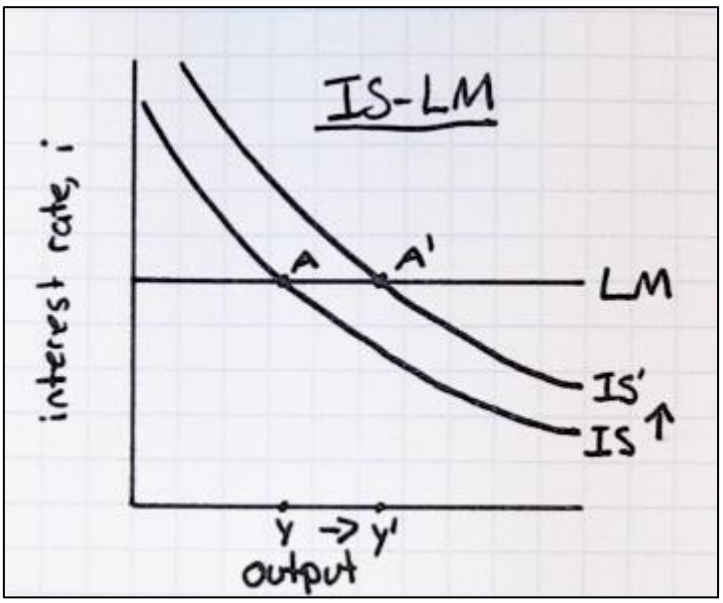
A decrease in output will lead to an increase in net exports, but the effect will be less than the effect of the increased interest rate, so this will again lead to a recession, because with lower output follows lower employment, and higher unemployment, which forces nominal wages and prices to decrease, which decreases inflation to under target. This is a movement downwards along the PC curve, so output is under its natural level. The movement is similar to the one drawn in question a.

In conclusion, if a one-time devaluation must be successful, it is important that financial investors' expected exchange rate matches the fixed exchange rate, or else it would create a new recession.

Exercise 2 – Open economy in the short run

a. A rise in consumer confidence, c_0, implies that consumption is higher than the initial level, because consumers want to buy more with the same income as before. When consumption increases, demand and output increases, and through the multiplier, investment increases, and consumption increases further, which increases output even more.

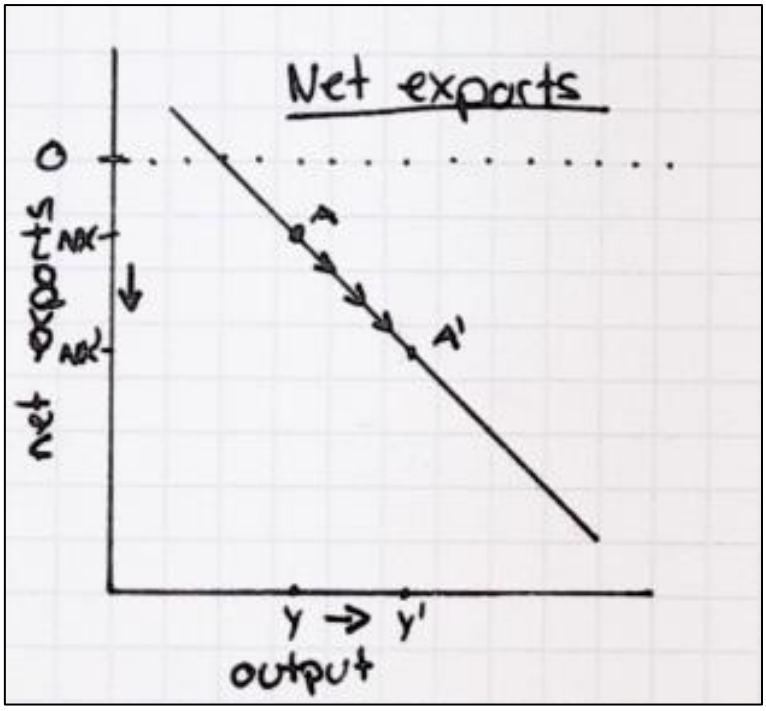
This is a rightwards shift of the IS curve from IS to IS' in the IS-LM diagram. The equilibrium moves from A to A', and output increases from Y to Y'.



b. The slope of net exports as a function of output is negative. This is because, when output increases, so does income, and with more income follows more consumption, which means that imports will increase. An increase in imports with no change in exports will decrease net exports.

The initial equilibrium is in point A with NX net export and Y output. After the increase in the consumer confidence, output increases which creates a movement downwards along the curve, so the new equilibrium is at point A' with NX' net export and Y' output.

The domestic economy was already in a trade deficit, and the decrease of the net export will have a negative effect on the trade balance and create an even bigger trade deficit than initially.

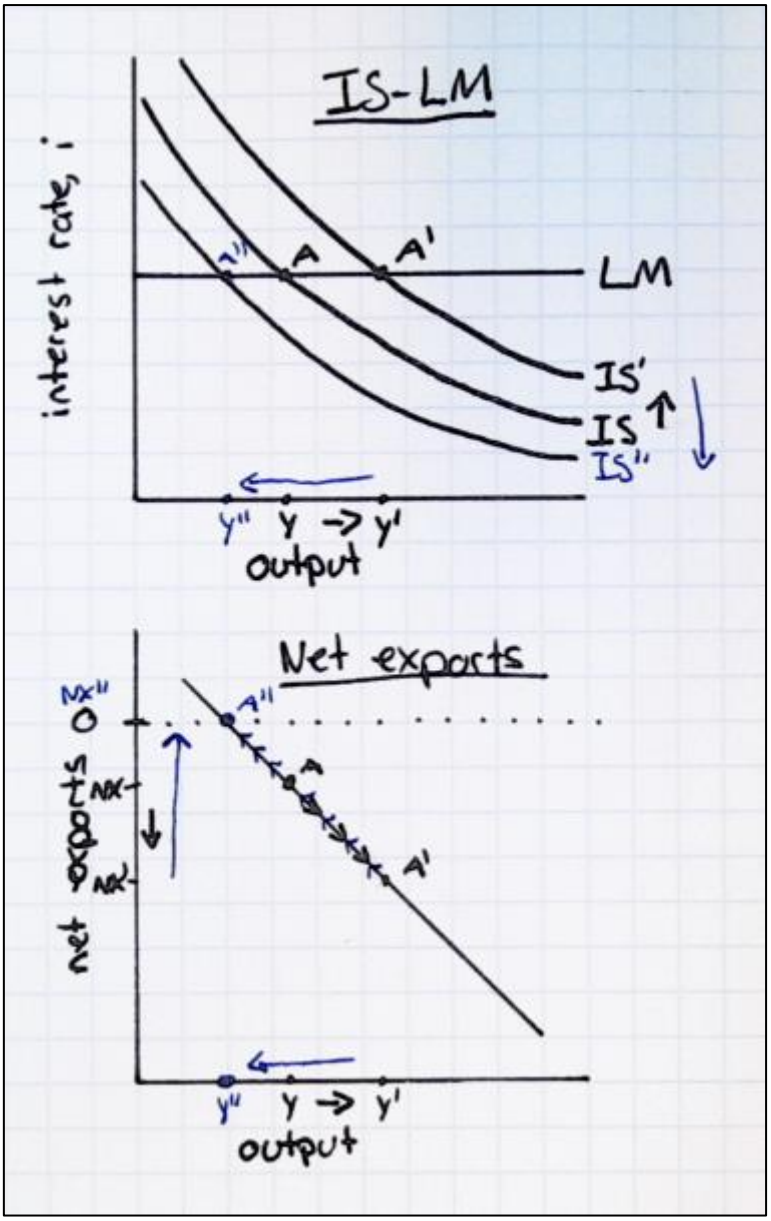


c. To reduce trade deficit to zero, government must use contractionary fiscal policy to decrease output, so net exports can be decreased to zero.

Government must either increase taxes or decrease government spending. An increase in taxes would decrease consumption and therefore demand and output. A decrease in government spending will also decrease demand and output. Through the multiplier, both contractionary fiscal instruments will decrease consumption, investment, and net exports which will decrease output further. This is a leftwards shift of the IS curve from IS' to IS''. The equilibrium moves from A' to A'', and output moves from Y' to Y''.

The economy was already running a trade deficit in its initial equilibrium (point A), so the effect of the contractionary fiscal policy must be bigger than the effect of the rise of consumer confidence. It the effects on output were equal (but still opposite → positive and negative), the new equilibrium point A'' would be at point A, and this correlates with point A on the net exports graph, which is still below zero, so this is not sufficient.

The decrease in output from Y' to Y'' creates a movement up along the net exports curve, and the new equilibrium is at point A'', with NX'' (= 0) net exports. The trade deficit is now neutral at zero.



[The trade deficit can also decrease if exports increase. This would create an upwards shift of the net export graph. But this relies on an increase in the foreign country's output, and the domestic country's government's policies does not have an impact on the foreign country's output.]

d. When the government uses government spending as a fiscal instrument, the increase or decrease in output will not be equal to the absolute value of the change in government spending. Both consumption, investment, and net exports is endogenous variables in an open economy, so the effect of the government spending is multiplied by the multiplier and affects the other channels.

Government spending itself does not affect other channels, but because it affects output, the endogenous variables are affected. A decrease in government spending will therefore, through the multiplier, decrease both consumption, investment, and net exports.

This is one more channel than in a closed economy. Because there is no trade in a closed economy, the multiplier does not affect net exports. In a closed economy, the multiplier only affects consumption and investment, which then affects output.

This also implies, that the impact of a change in government spending on output is larger in an open economy compared to a closed economy, because the multiplier affects more channels.

An increase in government spending will increase output more in an open economy than in a closed economy, and a decrease in government spending will decrease output more in an open economy than in a closed economy.

Exercise 3 – Risk premium and inflation

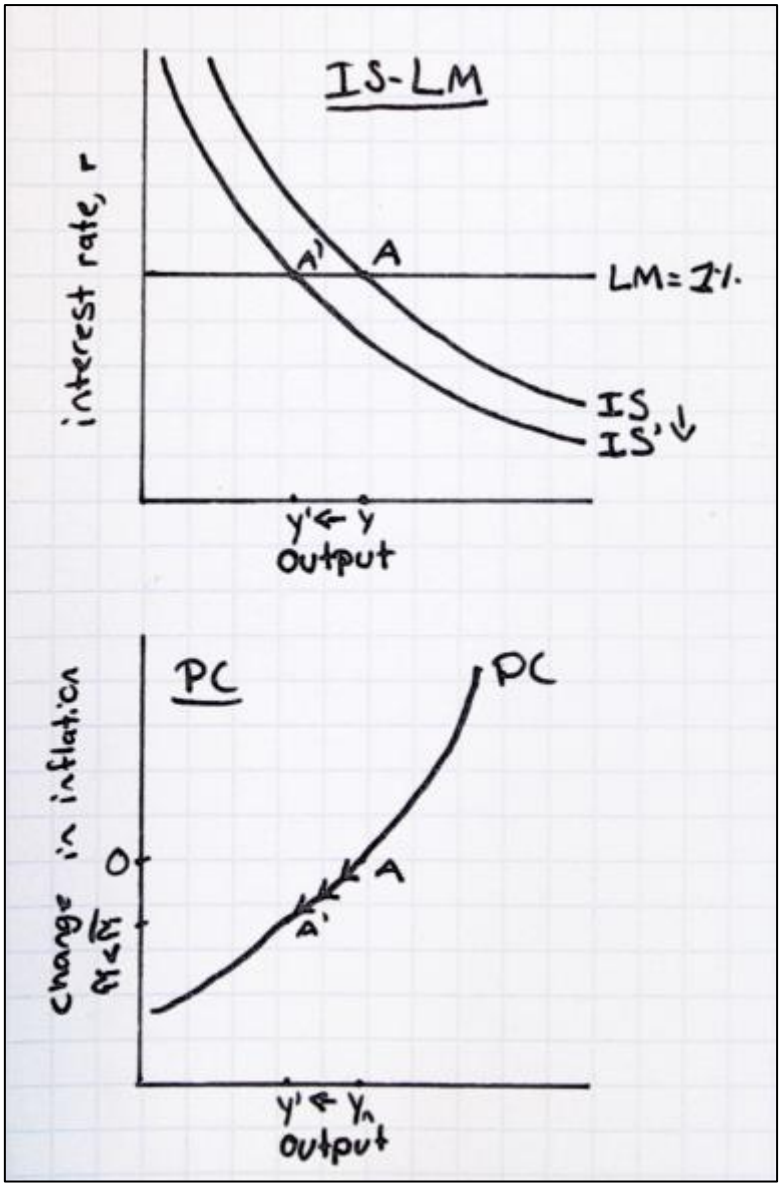
a. The increase in the risk premium increases the borrowing rate, which decreases investment. A decrease in investment decreases demand and output, and, through the multiplier, consumption and investment is decreased, which decreases output further.

When output is decreased, employment decreases, and unemployment increases. This decreases the bargaining power of workers, so nominal wages are lower, which also means that nominal prices are lower. This yields that the inflation rate decreases, and because the economy was at potential initially, the inflation rate is now under target. Therefore, output is under potential, and the output gap is negative.

Potential output is unchanged, and so is the nominal policy rate.

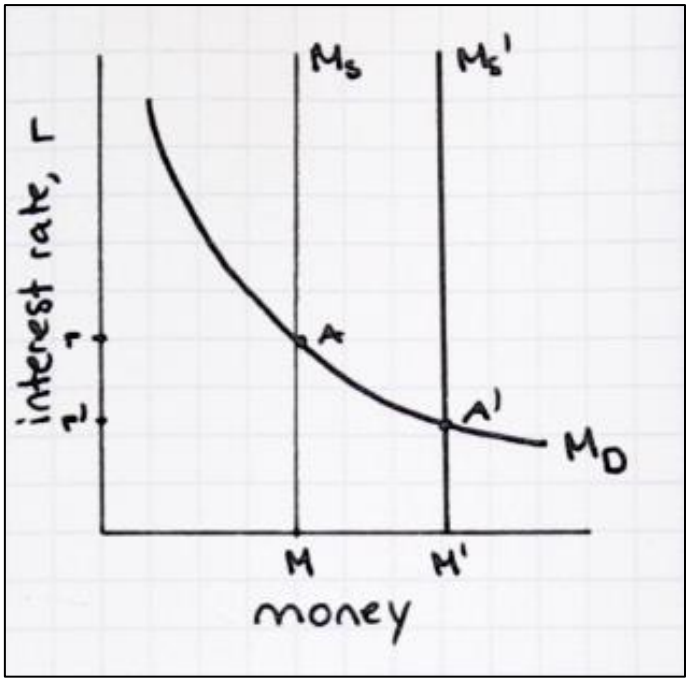
b. Output is decreased, as described in question a, and this creates a leftwards shift of the IS curve from IS to IS'. The LM curve is unchanged due to no change in the real policy rate. The central bank sets the real policy rate at: $r = \bar{r} = i - \pi^e$, so the real policy rate is: $r = \bar{r} = 3\% - 2\% = 1\%$. Equilibrium moves from A to A', and output from Y to Y'.

The effects on inflation, as described in question a, leads to a downwards movement along the PC curve from point A to A'. This clearly illustrates that the inflation rate is under target, and that output is under potential, which is shown by the output gap between Y_n and Y'.



c. The aim of the central bank is always to keep the inflation rate at target, so it is expected that the central bank will react with an expansionary monetary policy to decrease the policy rate, which increases output and therefore also the inflation rate (mechanisms explained further in question d).

The central bank can change the policy rate by changing its money supply. When the policy rate must be decreased, the central bank must increase their money supply. It can increase its money supply by buying bonds in the open market. This will shift the money supply curve rightwards and create a movement along the money demand curve, which brings the equilibrium from A to A', with a change in the policy rate from r to r', and the money from M to M'.

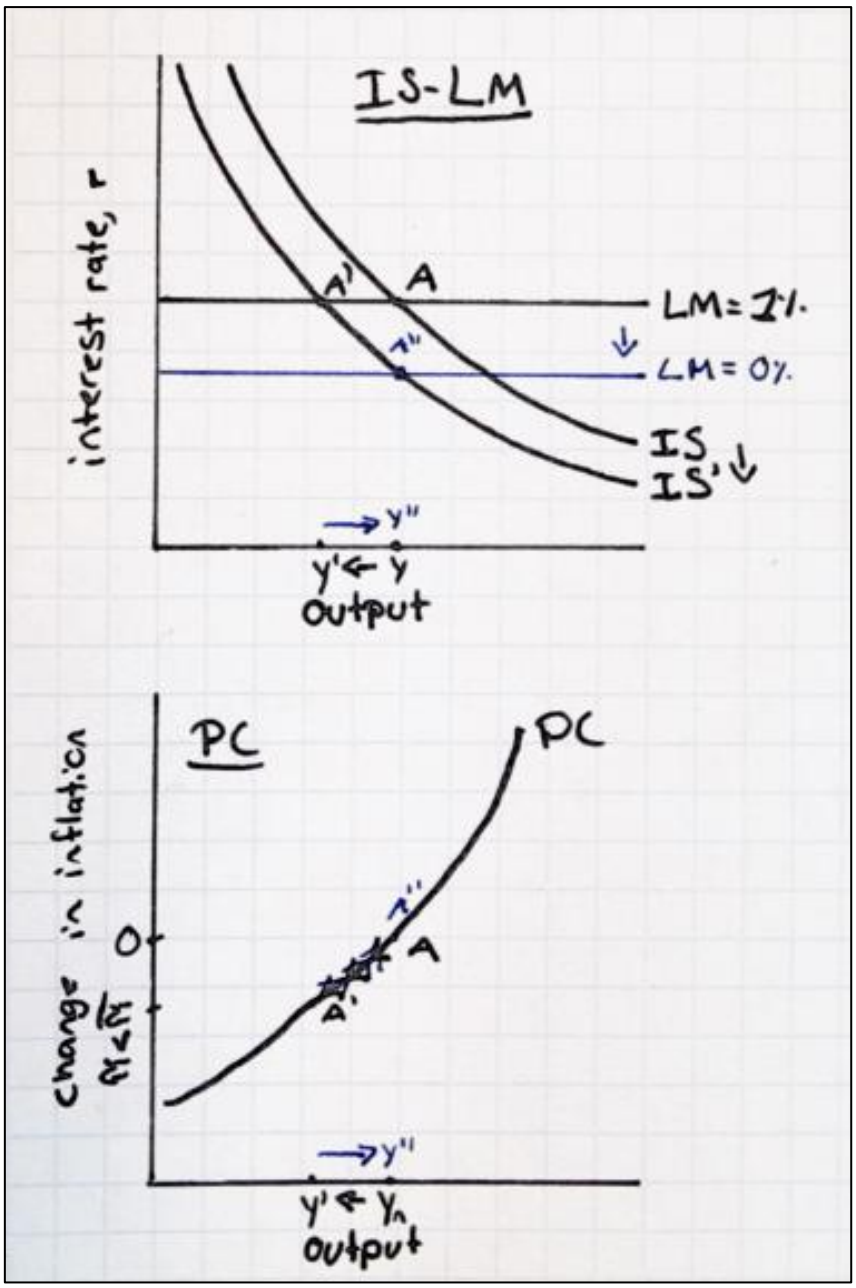


d. To get output back at its initial level, the borrowing rate must be the same as it initially was. Before the increase in the risk premium, the borrowing rate was $(i + x) = (3\% + 1\%) = 4\%$. With the increase in the risk premium from 1% to 2%, the new borrowing rate is $(3\% + 2\%) = 5\%$.

To bring output back to potential, and the inflation rate back to target, the nominal policy rate must then decrease to 2%, so the borrowing rate is still 4%. The new policy rate, that will bring inflation back to target, must then be: $r = \bar{r} = i - \pi^e \rightarrow r = \bar{r} = 2\% - 2\% = 0\%$.

The expansionary monetary policy will decrease the policy rate, which will increase capital investment and therefore demand and output. Through the multiplier, investment and consumption is increased, which will increase output further. This will shift the IS curve from IS' to IS'', which is placed on top of IS. The equilibrium will shift from A' to A'', which is also at the initial equilibrium at point A. Output will shift from Y' to Y'', which is back at Y.

With an increase in output, employment is increased, and unemployment is decreased. With higher bargaining power, more job possibilities, and an incentive to hire the best, nominal wages and prices increase, which increases the inflation rate. This is a movement along the PC curve from A' to A'', which shifts output back to its potential (Y'' = Y_n), so the output gap is 0, and the inflation rate is back at its target. There is no change in potential output.



e. If the risk premium increases from 2% to 3%, the borrowing rate is again 5%, and to keep output at its initial level, the nominal policy rate must be decreased further to 1%, so the borrowing rate can be kept at 4%. In order for the nominal policy rate to be 1%, the real interest rate must be -1%. This is possible, as long as the nominal policy rate is not under 0%, which is known as the zero-lower bound.

By increasing its money supply further, it would decrease the real policy rate to -1%, which corresponds to a nominal policy rate of 1% due to expected inflation of 2%. This would keep the borrowing rate, output, and inflation at its initial point.