

Economics – Basic Concepts (Practice)

Question 1

Consider the following model of an open economy:

- $C = 250 + 0.5(Y - T)$
- $I = 100 + 0.2Y - 2000i$
- $NX = 0.01 Y^* - 0.1Y + 100 \epsilon$
- $T = 200$
- $G = 200$
- $Y^* = 1500$
- $M_s = 800$
- $M_d = PY - 4000i$
- $i^* = 5\%$

where i is the interest, ϵ the real exchange rate, and the other variables have the usual meaning.

Suppose that $P = P^* = 1$. Assume that the country has a **fixed** exchange rate regime.

1) Compute the equilibrium Y , real exchange rate ϵ and ,trade balance NX . (Hints: Use LM relation to find Y , use IS relation to find ϵ)

In the equilibrium we have for the IS condition that

$$Y = C + I + G + NX,$$

$$\text{Now for the NX we have } NX = 0.01 * 1500 - 0.1Y + 100 \epsilon = NX \rightarrow 15 - 0.1Y + 100 \epsilon$$

Now for the original equation we have

$$Y = 250 + 0.5Y - 100 + 100 + 0.2Y - 100 + 200 + 15 - 0.1Y + 100 \epsilon + 200$$

$$0.4Y = 365 + 100 \epsilon$$

Now from the LM equation since the P is 1, we have $800 = Y - 4000 * 0.05$, So $Y = 1000$

From above equation we get $400 - 165 = 100 \epsilon$, so $\epsilon = 0.35$

Net Exports = -50

2) Assume that government spending G increases by 100. What does the Central Bank have to do in order to maintain the fixed exchange rate? Compute. (Hints: Find new equilibrium Y and from LM relation determine required money supply for money market equilibrium).

From the multiplier effect we can see that , $0.4 * \text{change in } Y = \text{change in } G$

So , Y will increase by 250 and the new Y will be 1250. From this we get $M_d = 1250 - 200 = 1050$, this is the new money supply. So the money supply will increase

3) Assume that $G=200$ again. The government would like to balance trade ($TB=0$) while leaving the output level you found in part 1) unchanged. What should it do? Compute the right mix of fiscal policy and exchange rate policy. (Hints: Set $NX=0$ in IS equation to find required change in G and Set $NX = 0$ in NX function to find required ϵ).

Now the trade balance is set to be equal to zero so we have , $NX=0$, and the output level remains 1000 , so ϵ will be equal to 0.85 . with this given IS equation we have that $0.4 Y = 165 + G + 100 \epsilon$
So , G remains to be 150, so the government has to reduce expenditure or in short there will be an contractionary monetary policy here.

Question 2

Assume that the following is true about the economy:

$$C = 84 + 0.1(Y - T)$$

$$I = 60 - 160i + 0.1Y$$

$$G = 40$$

$$T = 40$$

$$M_d = PY + 120 - 1000i$$

$$M_s = 200$$

Assume the following wage setting relation:

$W = P e (z - 20u)$ where $z = (28/10)$ is a parameter that represents the workers' bargaining power and u is the unemployment rate.

The following is the price setting relation: $P = (1+m)W$, where $m = 0.25$ is the markup.

The production function is $Y = N$. The labor force is $L = 200$.

1) Derive the equation that characterizes the AS curve.

Now when we make use of the wage and price setting, we get the AS curve, so

$P = (1+m)P_e(z-20u)$ is the AS curve

2) Derive the equation that characterizes the AD curve.

Now to derive the AD curve we make use of equation

$Y = C + I + G$, so we have

$0.8Y = 180 - 160i$

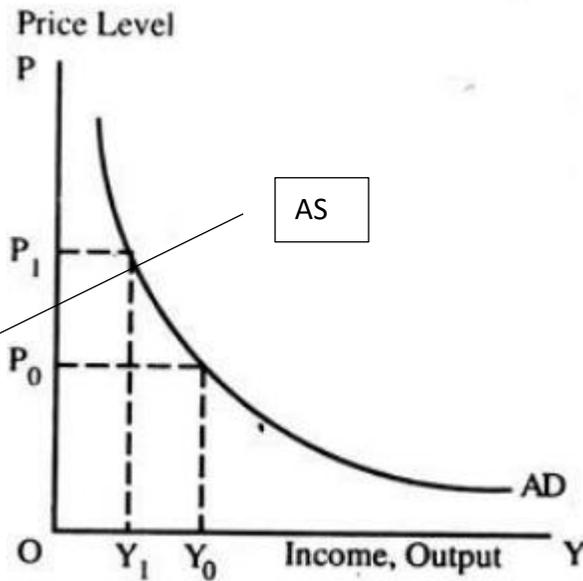
3) Compute the medium run equilibrium values for Y_n (the natural level of output), u_n (the natural rate of unemployment), P , and i . C and I .

So we have here that $2.8 - 20u = 1/1.25$, so $u = 0.1$ and u is defined as $1 - N/L$, so we have $N = Y = 180$ which is the natural level of output, u_n will be 0.1 , i from equation in 2 will be $0.2 * 180 / 160 = 0.225$

$P = 9/4$ from the money demand and money supply equation.

4) On a graph in the $\{P, Y\}$ space draw the AS and AD curves and their intersection, showing the values of the equilibrium points on the two axes. (Note: you do not need to compute the intercepts of the AS and AD relations.)

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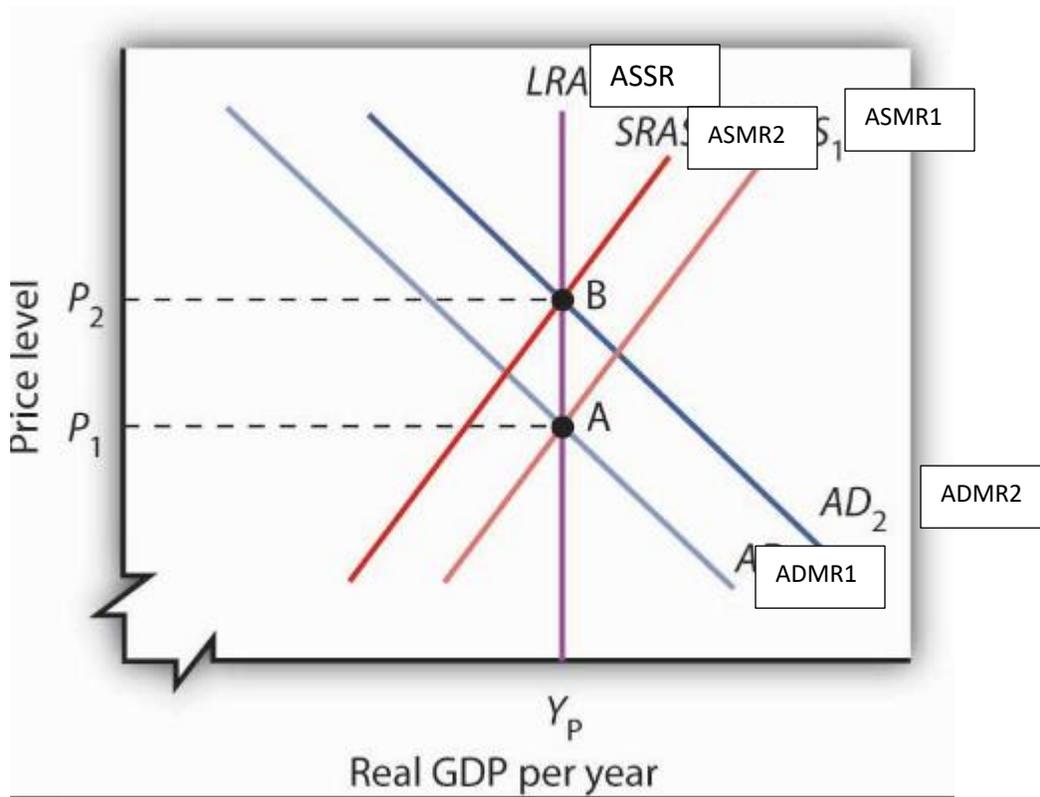
180

Consider the effect of an increase in both G and T from 40 to 50.

5) Calculate the new medium run levels of Y_n , u_n , P , and i .

As the unemployment rate will not change in short run, the output level will remain same as from before, the price and interest rate will change however, so $i = 45/160 = 0.28125$ and the new price will be $41/16$ so we see that if the government expands they need to increase price.

6) Graph the dynamics that bring the economy to the new equilibrium. Label all curves (ASMR1, ASSR, ASMR2 and ADMR1, ADSR, ADMR2), where MR1 and MR2 stand for the initial and new medium run equilibrium, respectively and SR stands for the short run.



Label the initial and the new equilibrium with the associated values on the axes.

So the new equilibrium is set up at B compared to A where there is same output but with increased price

7) How does the composition of GDP change compared to part 3)?

The real GDP remains same but the nominal GDP has increased with the expenditure

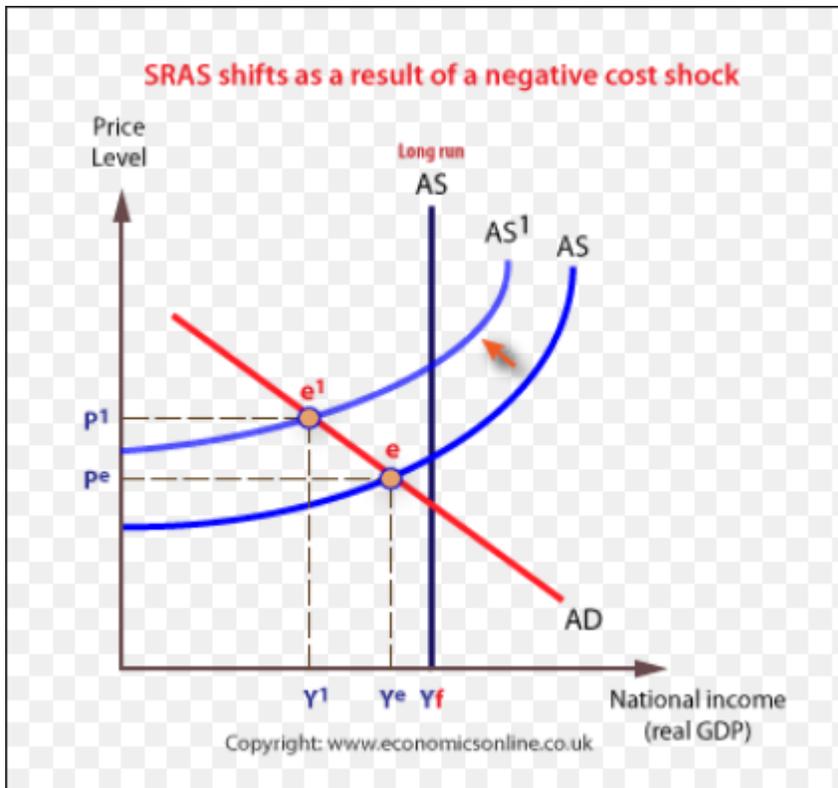
8) Would you get the same results as in part 7) following a change in monetary, rather than fiscal policy? Explain your answer.

No with the change in monetary policy there would be shift in the money supply curve and there would be higher output level and reduced price. Also the interest rates would increase

Question 3

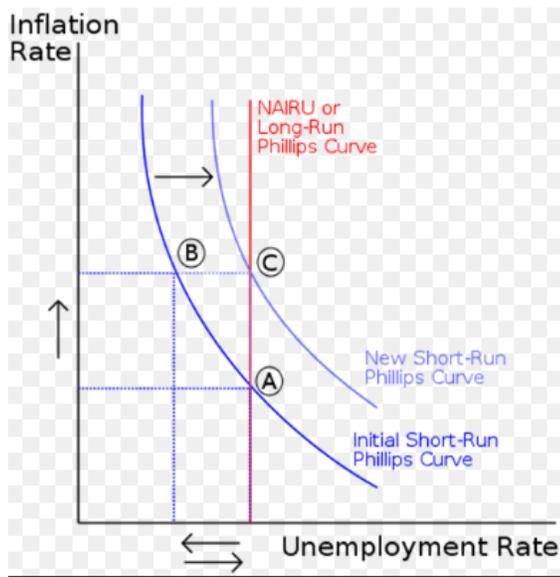
Assume that the economy starts at the natural level of output. Now suppose there is an increase in the price of oil.

- a. In an AS–AD diagram, show what happens to output and the price level in the short run and the medium run.



As there is increase in the price of oil, the supply would increase because there will be more incentives for the sellers to earn, as a result the demand with the new supply curve would be reduced and the overall output will reduce, in the case of long run the price will change only whereas the output will not change because people know that the expectations will eventually settle down.

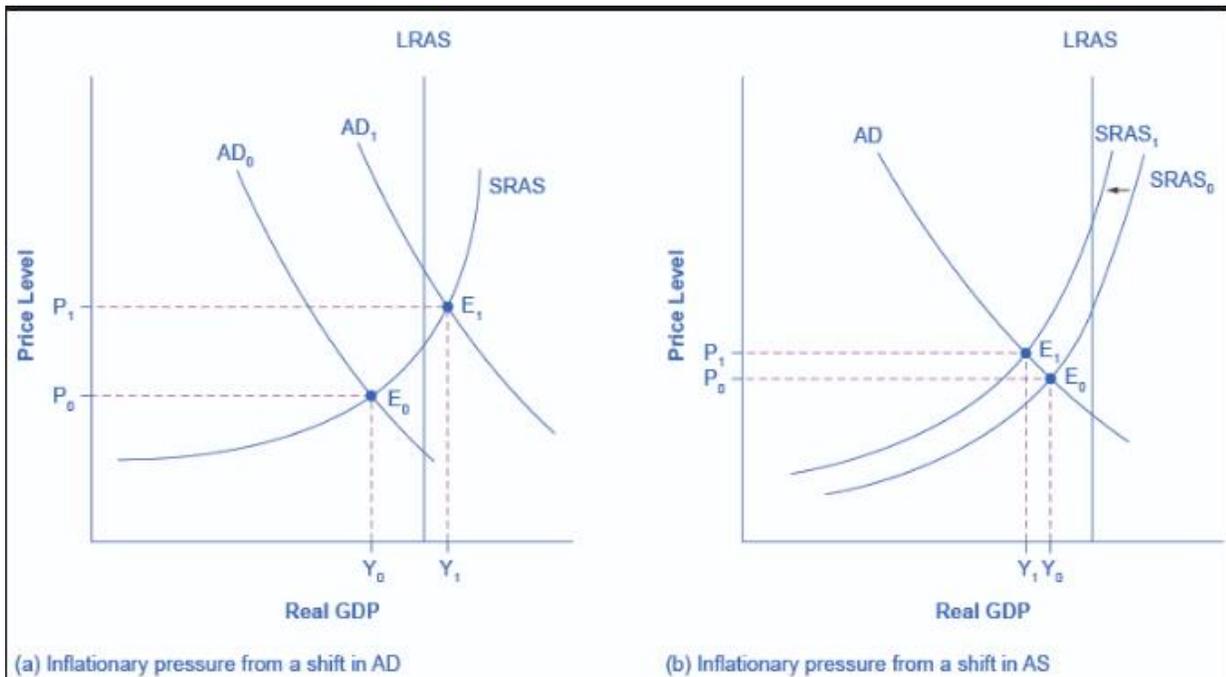
- b. What happens to the unemployment rate in the short run? In the medium run?



With increased prices we have more inflation and with the negative relation with the price level, the unemployment in short run will decrease because supply will increase and thus more labour will be hired. Also the real wages would reduce so people will have to work more for good pay. In the long run, there will be only inflation because people will not look for jobs in such case nor the employed will leave jobs because they know they won't get a job in the long run.

Suppose that the Bank of Canada decides to respond immediately to the increase in the price of oil. In particular, suppose that the Bank of Canada wants to prevent the unemployment rate from changing in the short run after the increase in the price of oil. Assume that the Bank of Canada changes the money supply once—immediately after the increase in the price of oil—and then does not change the money supply again.

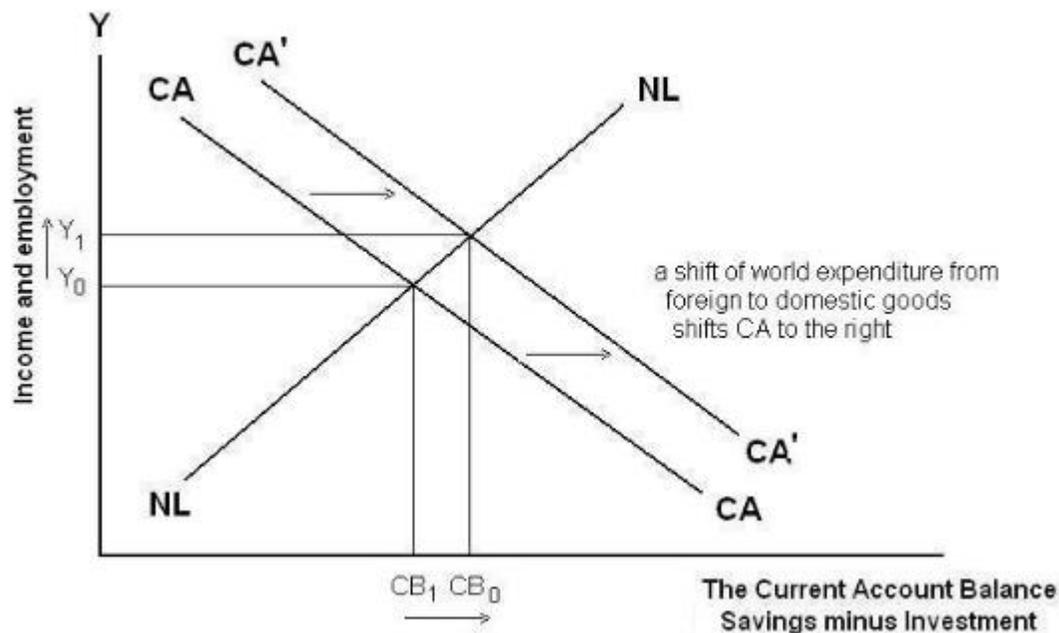
c. What should the Bank of Canada do to prevent the unemployment rate from changing in the short run? Show how the Bank of Canada's action, combined with the decline in business confidence, affects the AS-AD diagram in the short run and the medium run.



Now when we want the unemployment to remain same with the increase in money supply in economy. First with increased money supply we see there is an increase in the aggregate demand from AD_0 to AD_1 . With the increase in this demand we see that there is increase in the prices which lead to higher output, but seeing the incentive in high price, the supply also increases so the increase in output is now countered with further increase in price but the output remains same and thus the unemployment is changed. But when we look at the business confidence we see that it has reduced due to very high price levels.

Question 4 (25 points)

- a. Show the effect of a decrease in foreign output on domestic output. Explain in words.



When there is a decrease in foreign output, the domestic output will rise due to scope for increased exports. Due to this the net exports increase and the GDP rises. Another benefit is that the domestic output gets good prices in the market so the trade balance improves and thus the income will increase as well because of higher employment. And this also affects as the domestic currency appreciates vis a vis foreign currency.

b. Show the effect of an increase in foreign interest rate on domestic output. Explain in words.

If there is an increase in foreign interest rates means that taking loans in the foreign country is difficult and thus the investment in foreign country will decrease and the domestic country will be more attractive for investment as cheap loans are available there and thus the production would increase so domestic output will increase. There will be more inflow of money from foreign country.

c. "A monetary contraction abroad is likely to a recession at home". Discuss this statement.

Monetary contraction means that there is decrease in money supply in the economy. So there is less money now in the hands of people so the aggregate demand would reduce. So if there is decrease in the money supply abroad means that there is better interest rates abroad and so people will love to deposit and buy bonds which gives them higher interest coupons, so the domestic country will be at a

loss as the bond prices will reduce drastically and there will be no buyers and so there will be almost liquidity trap condition.