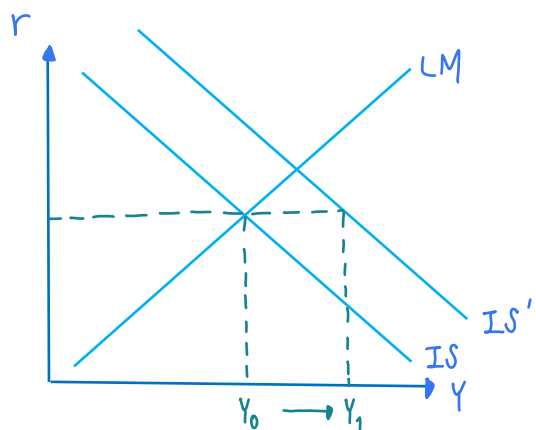


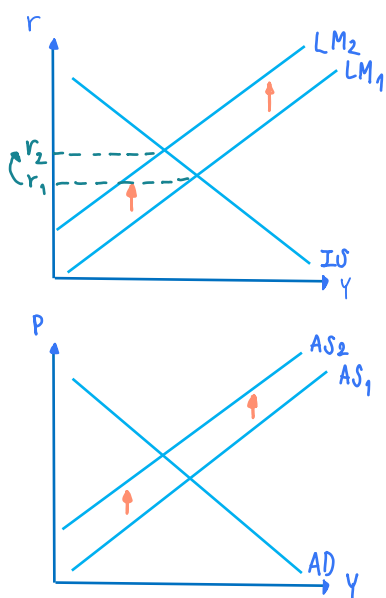
## Group 4 Question 1

- 1.2 The effect of fiscal policy is the strongest when monetary authority chooses to accommodate the government policy by fixing the interest rate.



This statement is true because fiscal policy with the fixing interest rate will maintain the level of output at the highest level without the effect from adjusting interest rate. For example, when the government increases its spending, IS curve will shift to the right and it will make the level of output ( $Y$ ) increase from  $Y_0$  to  $Y_1$  and maintain at  $Y_1$  which is the strongest effect of fiscal policy.

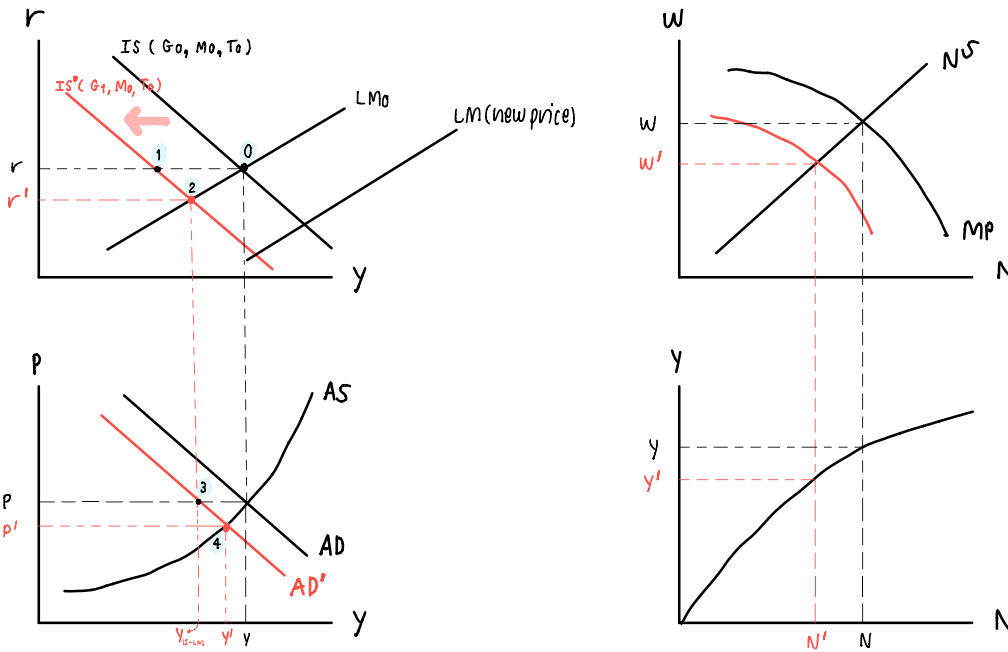
- 1.4 Based on the Keynesian theory, interest rate is a counter-cyclical variable under supply shocks.



This statement is true because the supply shocks make the interest rate moves in the opposite direction to the shocks. To illustrate, the negative supply shocks will affect aggregate supply curve to shift to the left and it consequently affect price to increase. Then, LM curve will shift to the left as price increases and it will affect the interest rate to increase. It is happening in the same way in positive supply shocks that cause interest rate to decrease. Therefore, the interest rate is a counter-cyclical variable under supply shocks.

Decreasing in govt. transfer (govt. spending) Negative IS shock

A short run impact



The unexpected permanent cut in government transfer from  $G_0$  to  $G_1$ .

A negative change causes IS curve to shift to the right from IS to IS'. Point 0 is original equilibrium before shock. Then, when  $r$  and  $P$  is fixed, the horizontal distance between 0 and 1 capture DAE multiplier effect.

1 → 2 is an effect of falling in  $r$  that partially stimulate the short fall of AE

3 represent the decreasing in AD when price is fixed at  $P$  (initial equilibrium price).

After taking into account of the negative IS shock, there is an excess supply in the market, therefore,  $P$  drops to  $P'$  in order to clear the excess supply. After price falls, the money supply increases and interest rate will decreases and it will cause the increase in consumption and investment and also cause  $y^d$  to increases. Moreover, lower price causes the negative effect to the supplier (firm needs to cut its production) and also cause the drop in wages ( $P \cdot MPN = w$ ) and labor employment

## 2 Medium run impact

In medium run, output, consumption, investment, labor employment, nominal wage, price, real wage and interest rate will rise back to the the initial level before shock.

3

Variables	Short-run (relative to initial level)	Medium-run	
		Relative to after- shock level (short- run)	Relative to initial level before shock
Output (real GDP)	falls	rise	equal
Consumption	falls	fall	fall
Investment	falls	fall	fall
Labor employment	falls	rise	equal
Nominal wage	falls	fall	fall
Price	falls	fall	fall
Real wage	falls	rise	equal
Interest rate	falls	fall	fall

4 If people can forecast the cut of government spending which make the price lower, the firm are going to cut the wage before the reduction is occurred to match with lower price. Therefore, at the time the government is reducing its transfers, the economy will still be at the same situation as before because it has already adjusted before the situation occurred.

Therefore, the price and interest rate will drop. Other variables will not get effect from the cut in government transfers because it is foreseeable.

The deviation of actual output from the trend can not be observed

## Question 3

$$\pi_t = \pi_t^e - 0.7(u_t - u_t^n) + v_t$$

$$\pi_t^e = (1-\theta)\bar{\pi} + \theta\pi_{t-1}$$

Given:  $\theta = 0$      $u_t^n = 5\%$      $v_t = 0$      $\bar{\pi} = 2\%$     In year  $t$ ,  $u_t = 3\%$

3.1) Rate of inflation in period  $t, t+1, t+2, t+3, t+4, t+5$

$$\begin{aligned}\pi_t^e &= (1-0)2 + 0 \\ \pi_t^e &= 2\%\end{aligned}$$

$$\begin{aligned}\pi_t &= \pi_t^e - 0.7(u_t - u_t^n) + v_t \\ \pi_t &= 2 - 0.7(-2) \\ &= 2 + 1.4 \\ &= 3.4\%\end{aligned}$$

$$\pi_t = \pi_{t+1} = \pi_{t+2} = \pi_{t+3} = \pi_{t+4} = \pi_{t+5} = 3.4\%$$

The actual rate of inflation is above the target by 1.4%.

3.2) People form an expected inflation based on the targeted inflation rate + historical data. As the actual inflation rate in year  $t+1$  rises to 3.4%, actual inflation rates would then increase in year  $t+1, t+2, t+3, t+4, t+5$ . Inflation rates cannot be kept constant.

3.3)  $\theta$  is the weighted average between the past observed inflation and the targeted inflation rate, therefore, as inflation rises to 3.4%,  $\theta$  increases.

$$\begin{aligned}3.4) \quad \pi_{t+6}^e &= (1-\theta)\bar{\pi} + \theta\pi_{t-1} \\ &= (1-1)(2) + (1)(3.4) \\ \pi_{t+6}^e &= 3.4\%\end{aligned}$$

$$\begin{aligned}\pi_{t+8} &= \pi_{t+7}^e - 0.7(3-5) \\ &= 6.2 + 1.4 \\ &= 7.6\end{aligned}$$

$$\begin{aligned}\pi_{t+6} &= \pi_{t+5}^e - 0.7(3-5) \\ &= 3.4 + 1.4 \\ &= 4.8\%\end{aligned}$$

$$\begin{aligned}\pi_{t+9} &= \pi_{t+8}^e - 0.7(3-5) \\ &= 7.6 + 1.4 \\ &= 9\%\end{aligned}$$

$$\begin{aligned}\pi_{t+7} &= \pi_{t+6}^e - 0.7(3-5) \\ &= 4.8 + 1.4 \\ &= 6.2\%\end{aligned}$$

3.5) When  $\theta = 1$ , people form an expected inflation rate based on the previous year's ( $t-1$ ) inflation rate, not from the targeted rate. This causes inflation rate to increase by 1.4% every year.

$$\begin{aligned}
 3.6) \quad \pi_{t+10} &= \pi_t^e - 0.7(5-5) \\
 &= \pi_{t+9}^e \\
 &= 9\%
 \end{aligned}$$

Based on the calculation, the actual inflation rate is 9% which is higher than the central bank's target by 7%. Therefore, the central bank is not successful

$$\begin{aligned}
 3.7) \quad \pi_{t+11} &= \pi_t^e - 0.7(u_t - u_t^n) + v_t \\
 2 &= 9 - 0.7(u_t - 5) \\
 u_t &= \frac{9-2}{0.7} + 5 \\
 &= 10 + 5 \\
 &= 15\%
 \end{aligned}$$

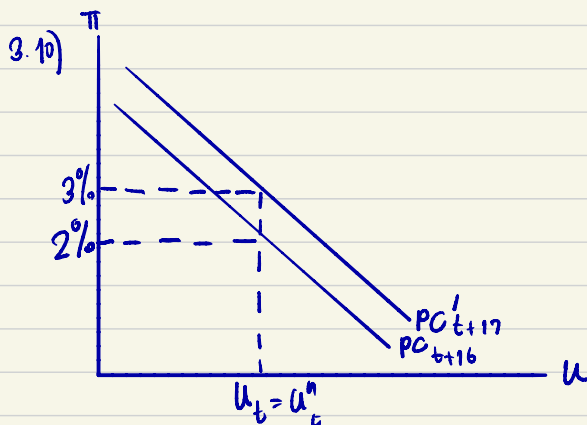
They have to increase unemployment rate to 15%

$$\begin{aligned}
 3.8) \quad \pi_{t+12} &= \pi_t^e - 0.7(u_t - u_t^n) + v_t \\
 &= 2 - 0.7(5-5) \\
 &= 2\%
 \end{aligned}$$

$$\pi_{t+12} = \pi_{t+13} = \pi_{t+14} = \pi_{t+15}$$

The inflation rate in period  $t+12, t+13, t+14, t+15 = 2\%$

3.9) As the central bank sets inflation at 2%, people may form an expected inflation based on this target, and not the past macroeconomic outcomes,  $\theta$  may reduce from 1 to 0.



$$\pi_{t+16} = 2$$

$$\pi_{t+16}^e = (1-0)\bar{\pi} = 2\%$$

$$\begin{aligned}
 \pi_{t+17} &= \pi_t^e - 0.7(u_t - u_t^n) + v(t) \\
 &= 2 + 1 \\
 &= 3\%
 \end{aligned}$$

3.11)  $v_t$  becomes 0 as the shock disappears

$$\pi_{t+18} = \pi_{t+19} = 2\%$$

$$\begin{aligned}
 3.12) \quad \theta &= 1 \\
 \pi_{t+18}^e &= (1-\theta)\bar{\pi} + \theta\pi_{t-1} \\
 \pi_{t+18}^e &= \theta\pi_{t-1} \\
 &= 3\%
 \end{aligned}
 \quad \left| \quad
 \begin{aligned}
 \pi_{t+17} &= 3\% \\
 \pi_{t+18} &= \pi_t^e - 0.7(u_t - u_t^n) + v(t) \\
 &= 3\% \\
 \pi_{t+19} &= 3 - 0.7(0) = 3\%
 \end{aligned}$$

3.13) If the government wants to keep inflation at 2%, they have to increase unemployment rate

3.14) When  $\theta = 1$ , people take into account the historical inflation rates and not the targeted inflation rate when forming an expectation.

When  $\theta = 0$ , people take into account the inflation target only, and the targeted inflation rate is equal to the expected inflation rate. As a result, if an unemployment rate is the same as the previous year, the inflation rates between 2 years would be the same and the economy is stable.

Under the presence of supply shocks, the factors that determine the inflation rate + rate of unemployment are the expected inflation rate which depends on  $\theta$ , and the policies used.