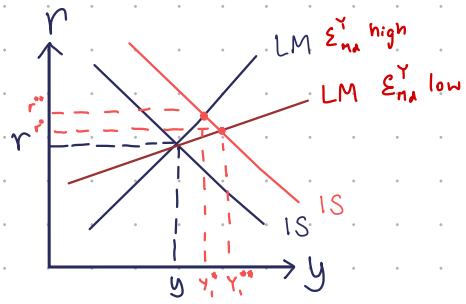
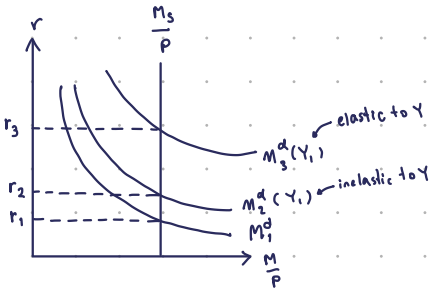
GROUP 11

1.1 IS (random) shocks can generate a bigger volatility in real GDP under elastic money demand than under inelastic money demand.

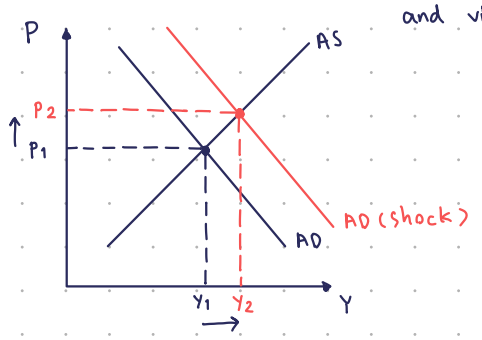
The statement is false because inelastic money demand given higher GDP than elastic money demand.





1.3 Based on the Keynesian theory, demand shocks produce a negative co-movement between price and output. That is, price is a countered-cyclical variable under demand shocks.

The statement is false because actually it's positive co-movement because when AD shift upward, price and output will increase and vice-versa.



$M_S \uparrow \Rightarrow$ LM shift ขวา

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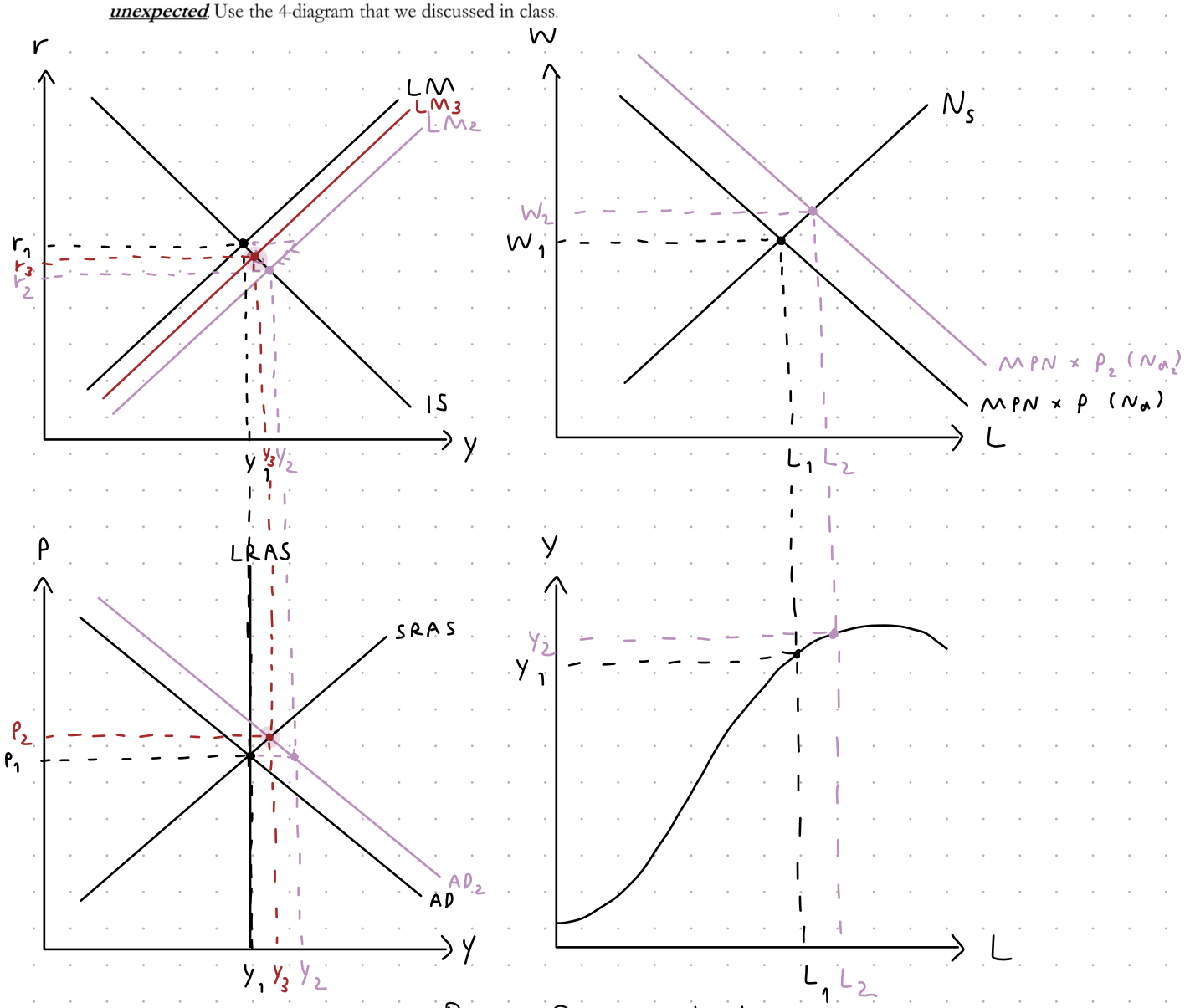
Question 2 (Self-adjustment theorem and expectation)

2.1 Suppose the economy is operating at the long-term trend, i.e. natural level. Analyze the impact of a permanent increase in the money supply under the following scenarios.

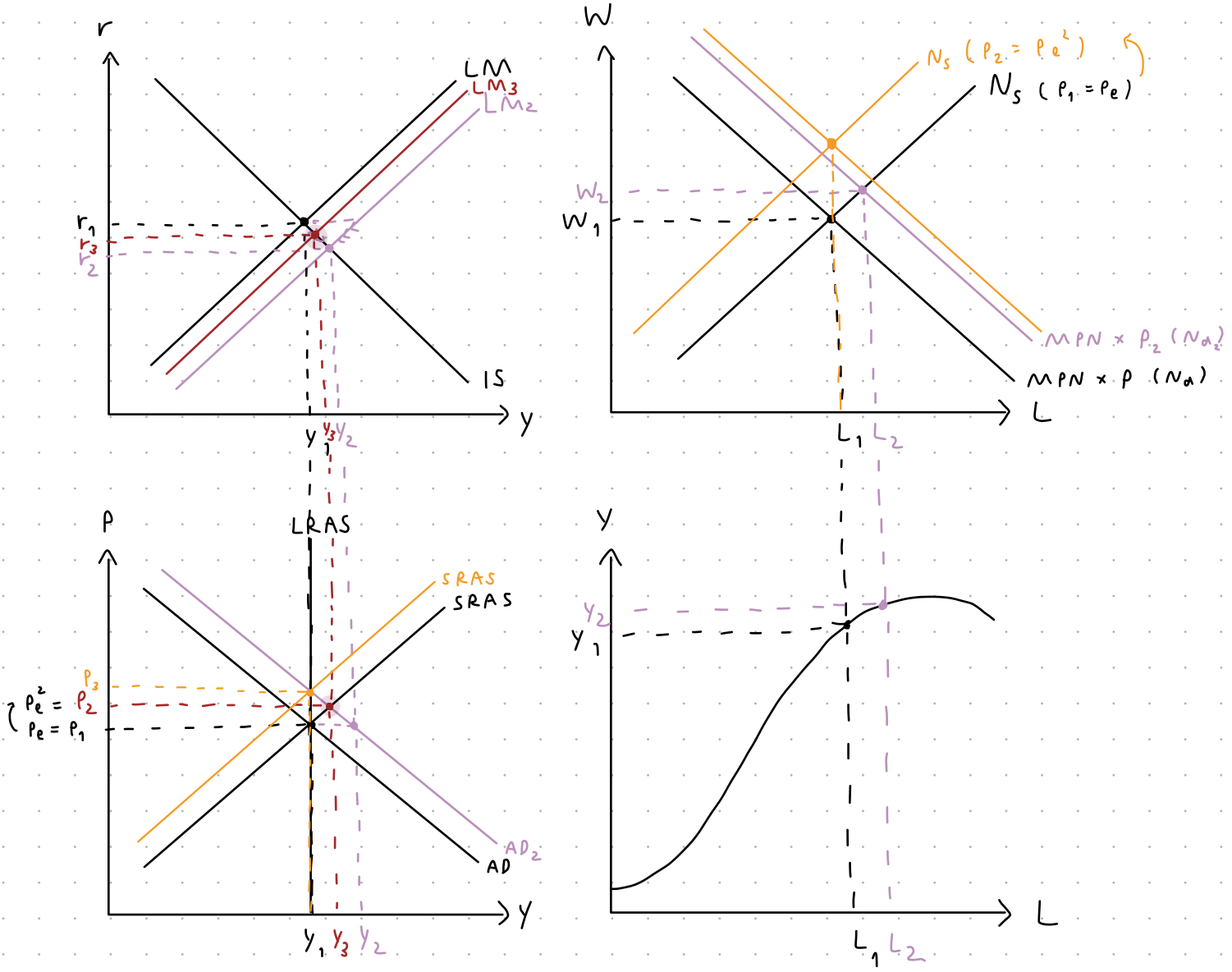
a. What would be the short-run impact on macroeconomic variables if *the permanent increase is* ***unexpected*** Use the 4-diagram that we discussed in class.



Positive Demand Shock

1. $M^s \uparrow \Rightarrow r \downarrow \Rightarrow$ LM shift var
2. $r \downarrow \Rightarrow I \uparrow \Rightarrow y \uparrow \Rightarrow$ IS move along the curve
3. $y \uparrow \Rightarrow M^d \uparrow \Rightarrow r \uparrow \Rightarrow$ LM move
4. $y \uparrow$ at $P_1 \Rightarrow$ AD shift var $\Rightarrow$ excess demand $\Rightarrow P \uparrow (P_1 \to P_2)$
5. $P \uparrow \Rightarrow \frac{M^s}{P} \downarrow \Rightarrow r \uparrow (r_2 \to r_3)$: LM shift ลงมา $(L_2 \to L_3)$
6. $r \uparrow \Rightarrow I \downarrow \Rightarrow y \downarrow (y_2 \to y_3)$
7. $P \uparrow \Rightarrow MPN \times P \uparrow \Rightarrow D_L$ shift var $\Rightarrow W \uparrow (w_1 \to w_2)$, $L \uparrow (L_1 \to L_2)$
8. $L \uparrow \Rightarrow y \uparrow (y_1 \to y_3)$

b. Describe what would happen over the medium-run. Link your analysis to the 4-diagram used in the previous sub-question.



Positive demand shock (AD ↑)

$P_1 = P_e$

$P_1 \uparrow (P_1 \to P_2) \Rightarrow P_e \uparrow (P_{e_1} \to P_{e_2}) \Rightarrow$ SRAS shift left

c. Based on your analyses above, complete the following table.

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)	↑	↓	=
Consumption	↑	↓	=
Investment	↑	↓	=
Labor employment	↑	↓	=
Nominal wage	↑	↑	↑
Price	↑	↑	↑
Real wage	↓	=	=
Interest rate	↓	↑	=

d. If the permanent cut in government transfers is **anticipated**, what would be the short-run impact on macroeconomic variables? Would one observe a deviation of actual output from the trend level?

short run aggregate supply (SRAS) and Long run aggregate supply (LRAS) shift leftward so as well as output because of the permanent cut in government transfer. The equilibrium will not adjust back to the initial point (temporary shock).

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

Assume that the inflation expectation is given by,

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

where $\bar{\pi}$ is the level of targeted inflation, set and publically announced by the central bank. In words, we assume that people form the expectation using the weighted average between past observed inflation and the targeted inflation rate. The value of theta (θ) could be between 0 and 1.

Suppose that (i) θ is now equal to zero, (ii) the rate of unemployment initially stays at the natural rate of unemployment, assumed to be equal to 5%, (iii) ϑ_t is set equal to zero where there is no random shocks, and the inflation target $(\bar{\pi})$ is set to be 2%. *In year t, the government decides to bring the unemployment rate down to 3%, and hold it there forever.* Answer the following question

3.1) Determine the rate of inflation in period t, t+1, t+2, t+3, t+4, t+5. How does the value of inflation in each period compare with the targeted inflation $(\bar{\pi})$?

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

Assume $\theta = 0$; $\pi_t^e = \bar{\pi} = 2\%$

$\pi_{t+1} = \bar{\pi} = 2\%$

$\pi_{t+2} = \bar{\pi} = 2\%$

$\pi_{t+3} = \bar{\pi} = 2\%$

$\pi_{t+4} = \bar{\pi} = 2\%$

as π^e in period $t = 1-5$ is equal to $\bar{\pi} = 2\%$

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

$v = 0$, $u_t^n = 5\%$, $u_t = 3\%$ $\pi_t = 0.02 - 0.7(0.03 - 0.05)$

$= 3.4\%$

To conclude, π_t from $t = 1-5 > \bar{\pi}$

$3.4\% > 2\%$

3.2) Do you believe the answer given in 3.1? Why or why not? (Hint: Think about how people are more likely to form the expectations of inflation.)

I do not believe because people are more clever to predict the expected inflation by using past inflation to forecast. So, they are related and θ is not zero.

Now suppose in year t+6, θ increases from 0 to 1. Suppose that the government still determines to keep unemployment rate at 3%

3.3) Why might theta (θ) increase this way?

Due to the fact that past inflation strongly related to the prediction of future expected inflation.

3.4) What might be the rate of inflation in period t+6, t+7, t+8, and t+9?

As $\pi_{t+5} = 3.4\%$

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

$\pi_{t+6}^e = \pi_{t+5} = 3.4\%$

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

$\pi_{t+6} = 0.034 - 0.7(0.03 - 0.05)$

$= 0.048$

$\pi_{t+7} = 0.048 - 0.7(0.03 - 0.05)$

$= 0.062$

$\pi_{t+8} = 0.062 - 0.7(0.03 - 0.05)$

$= 0.076$

$\pi_{t+9} = 0.076 - 0.7(0.03 - 0.05)$

$= 0.09$

3.5) From (3.4), what can we conclude about inflation when $\theta = 1$ and unemployment rate is kept at 3%?

As $\theta = 1$, $u_t = 3\%$, the inflation increase by 1.4% every year from period t+6 to t+9.

Now suppose in year t+10, a new government is elected. The government reforms the authority under control. It determines to keep unemployment rate at 5% and brings the inflation down to the targeted level ($\bar{\pi}$). $\bar{\pi}_t = 2\%$.

3.6) What happen to inflation in period t+10 if the government instead keeps the unemployment rate at 5%. Would this allow central bank to be successful in achieving the targeted inflation in period t+10?

At $t+10$, $u_{t+10} = 5\%$, $u^n_{t+10} = 5\%$, $\bar{\pi} = 2\%$.

$$\pi^e_{t+10} = (1-\theta)\bar{\pi} + \theta \pi_{t+9}$$

$$\pi^e_{t+10} = \pi_{t+9} = 9\%$$

$$\pi_{t+10} = \pi^e_{t+10} - 0.7(u_{t+10} - u^n_{t+10}) + v$$
$$= 0.09 - 0.7(0.05 - 0.05)$$
$$= 0.0 = 9\%$$

∴ Central bank are not successful in achieving the targeted inflation.

3.7) To bring down the inflation to the targeted level, what does government need to do in period t+11? What will happen to the unemployment rate?

As $\bar{\pi} = 2\%$, $u^n_{t+11} = 5\%$

$$\pi^e_{t+11} = (1-\theta)\bar{\pi} + \theta \pi_{t+10}$$
$$\pi^e_{t+11} = \pi_{t+10} = 9\%$$

To bring $\pi_{t+11} = 2\%$

$$\pi_{t+11} = \pi^e_{t+11} - 0.7(u_{t+11} - u^n_{t+11}) + v$$
$$0.02 = 0.09 - 0.7(u_{t+11} - 0.05)$$
$$0.1 = u_{t+11} - 0.05$$
$$u_{t+11} = 0.15 = 15\%$$

∴ Unemployment rate will rise to 15%

3.8) Given the result in (3.7) and its full commitment to keep unemployment rate at 5%, what happen to inflation in period t+12, t+13, t+14, t+15?

The result in (3.7); $\pi_{t+11} = \bar{\pi} = 2\%$

$$\pi^e_{t+12} = (1-\theta)\bar{\pi} + \theta \pi_{t+11}$$
$$\pi^e_{t+12} = \pi_{t+11} = 2\%$$
$$\pi_{t+12} = \pi^e_{t+12} - 0.7(u_{t+12} - u^n_{t+12}) + v$$
$$\pi_{t+12} = 2\% - 0.7(0.05 - 0.05)$$
$$= 2\%$$

As $\theta = 1$ and $u_t = u^n_t$ meaning that past inflation are strongly related to expected inflation and as $u_t = u^n_t$ meaning that the inflation will not change because there are no different between u_t and u^n_t so, the inflation from t+12 to t+15 will be equal as 2%.

Now suppose in year t+16, the value of theta reduces from 1 t0 0.

3.9) Why might theta (θ) reduce this way? What can we imply about the value of theta (θ) and the past macroeconomic outcomes?

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

As $\theta = 0$ meaning that past inflation has no effect to predict the expected inflation and the past macroeconomic outcome are not related to the future.

Now suppose that, in year t+17, Oil price suddenly increases, causing the random supply shocks to be equal to 1%. *Assume the supply shock occurs temporarily, and takes the value of 1% only in period t+17. In the period afterwards, the shocks disappear, with the value of* v_t *set to remain zero.*

$v = 1\%$

3.10) With the supply shock and the policy to keep unemployment rate at its natural level, what is th inflation in period t+17? Supplement your analysis using the diagram that we discussed in class.

$\theta = 0$

$\pi^e_{t+16} = (1-\theta)\bar{\pi} + \theta\pi_{t+15}$

$\pi^e_{t+16} = \bar{\pi} = 2\%$

$\pi_{t+16} = \pi^e_{t+16} - 0.7(u_{t+16} - u^n_{t+16}) + v$

$= 2\% - 0.7(0) = 2\%$

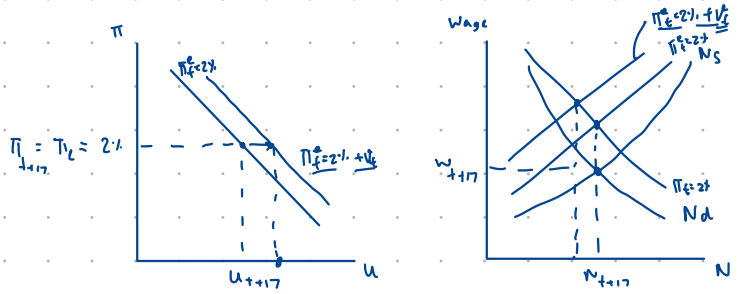
$\pi^e_{t+17} = (1-\theta)\bar{\pi} - \theta\pi_{t+16}$

$= \bar{\pi} = 2\%$

$\pi_{t+17} = \pi^e_{t+17} - 0.7(u_{t+17} - u^n_{t+17}) + v$

$= 2\% - 0 + 1\%$

$= 3\%$



3.11) What happen to the inflation in period t+18 and t+19?

$\theta = 0$, $v_t = 0$ $\pi_{t+17} = 3\%$

$\pi^e_{t+18} = (1-\theta)\bar{\pi} + \theta\pi_{t+17}$

$= \bar{\pi} = 2\%$

$\pi_{t+18} = \pi^e_{t+18} - 0.7(u_{t+17} - u^n_{t+17}) + v$

$= 2\% - 0 - 0$

$= 2\%$

$\pi^e_{t+19} = \bar{\pi} = 2\%$

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

∴ the inflation in period t+18 and t+19 is as same as the inflation before the shock happened at $\pi_{t+16} = 2\%$

3.12) Redo (3.10) and (3.11) with the alternative assumption that the value of theta (θ) sets equal to 1. What would happen to the inflation in period t+17 and t+18? Would the inflation in period t+18 be equal to the targeted level?

$\theta = 1$, $\pi_{t+16} = 2\%$, $\bar{\pi} = 2$, $u = 5\%$, $u^n = 5\%$

$$\pi^e_{t+17} = (1-\theta)\bar{\pi} + \theta\pi_{t+16}$$
$$= \pi_{t+16} = 2\%$$
$$\pi_{t+17} = \pi^e_{t+17} - 0.7(u_{t+17} - u^n_{t+17}) + v$$
$$= 2\% - 0 + 1\%$$
$$= 3\%$$
$$\pi^e_{t+18} = (1-\theta)\bar{\pi} + \theta\pi_{t+17}$$
$$= 3\%$$
$$\pi_{t+18} = 3\% - 0$$
$$= 3\%$$

∴ the inflation in period t+18 is not equal to the targeted level.

3.13) Following from the analysis in (3.12), what would be the required policy plan in year t+19 if the government wants to keep the inflation equal to *the targeted level* ($\bar{\pi}$)?

To reach $\pi_{t+19} = \bar{\pi} = 2\%$, $\theta = 1$

$$\pi^e_{t+19} = (1-\theta)\bar{\pi} + \theta\pi_{t+18}$$
$$= \pi_{t+18} = 3\%$$

$$\pi_{t+19} = \pi^e_{t+19} - 0.7(u_{t+19} - u^n_{t+19}) + v$$

$$0.02 = 0.03 - 0.7(u_{t+19} - 0.05)$$
$$u_{t+19} = 0.064 = 6.4\%$$

∴ The government have to bring unemployment rate to 6.4%.

3.14) Based on the analysis given so far, do you think what could possibly determine the volatility of rate of inflation and the rate of unemployment under the presence of supply shocks? How does the credible commitment on inflation target play role in the determination of macroeconomic stability outcomes?

If there is no volatility $\pi_t = \pi^e_t$ and $u_t = u^n_t$ however, if $v > 0$; π_t is more than π^e_t in order to keep $\pi_t = \pi^e_t$ government have to adjust their unemployment rate by trading-off the u_t and π_t. If there are supply shock $v > 0$, to adjust $\pi_t = \pi^e_t$ there have to increase the $u_t > u^n_t$ to keep $\pi_t = \pi^e_t$

The target inflation rate pay the important role in macroeconomic stability because it is the trend that inflation should follow. If there deviate much from $\bar{\pi}$ meaning that the macroeconomic are less stable and vice versa.