

Problem Sets 5 :

Chapter 5. ISLM Model and Chapter 7 AD-AS Model

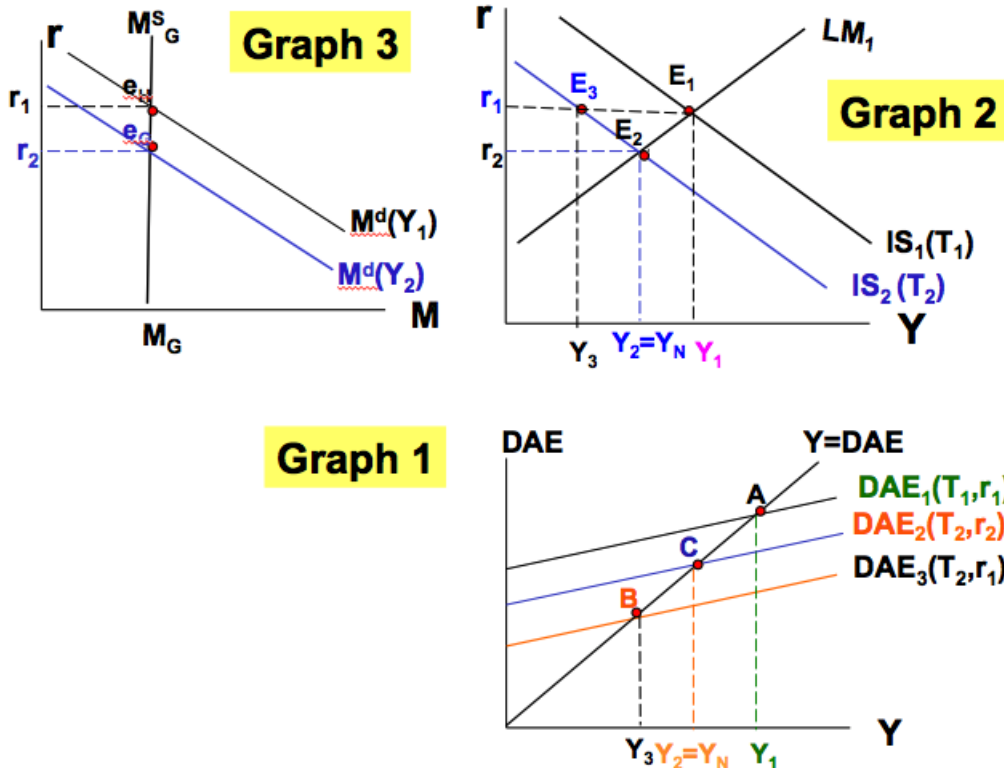
\* Note that when there are many parts in one question, please **indicate clearly the part you are answering**. For example, **(a)** Answer. — **(b)** Answer. —. **Apply this way to exam as well.**

\* **If the space provided is not enough, you may attach a separate sheet.**

1. In case of inflationary economy, should government increase or decrease personal income tax rate to solve the problem? Use IS-LM model to explain your answer. Clearly demonstrate crowding-out effect situation and adjustment process in each market in the economy (supplement necessary diagrams to illustrate the explanation).

**Solution.**

- The economy is facing with **inflationary gap**. This means that equilibrium output ( $Y^E$ ) is greater than potential output ( $Y_N$ ).
- Let the **initial equilibrium** is at point A in graph 1, point E1 in graph 2 and point  $e_H$  in graph 3.
- Initial output is  $Y_1$  which is greater than potential output ( $Y_N$ ). Initial interest rate is  $r_1$ .



- To close the inflationary gap, the government should decrease desired aggregate expenditure.
- Therefore, the government should use **contractionary fiscal policy**.
- The government should **increase personal income tax rate**. Tax increases from  $T_1$  to  $T_2$ .

- Increase personal income tax rate would reduce consumption for all levels of income and interest rate. **DAE shift down from  $DAE(T_1, r_1)$  to  $DAE(T_2, r_1)$ .**
- As a result, **IS curve shift to the left** from  $IS_1$  to  $IS_2$ .
- **Interest rate decreases** from  $r_1$  to  $r_2$  and output decreases from  $Y_1$  to  $Y_2$ , which is equal to potential output ( $Y_N$ ). Inflationary gap is closed.
  - The **adjustment to the new equilibrium** is as follows.
  - At the initial level of interest rate ( $r_1$ ), DAE shifts down from  $DAE(T_1, r_1)$  to  $DAE(T_2, r_1)$  and output decreases from  $Y_1$  to  $Y_3$ , which is the point  $E_3$  in graph 2.
  - As tax decreases, **interest rate decreases from  $r_1$  to  $r_2$ , investment increases, DAE shifts up from  $DAE(T_2, r_1)$  to  $DAE(T_2, r_2)$ .** This is **movement along the curve IS** from point  $E_3$  to point  $E_2$  in graph 2. Output increases from  $Y_3$  to  $Y_2$ ,
  - Expansionary fiscal policy that raises up interest rate and put pressure on private investment is called “**crowding out effect**”.
  - In this case, contractionary fiscal policy **reduces interest rate and raises private investment. The size of crowding out effect is  $Y_3Y_2$  [movement from  $E_3$  to  $E_2$ ].**
- From graph 2, **output decreases** from  $Y_1$  to  $Y_2$ . Hence, money demand decreases from  $M^d(Y_1)$  to  $(M^d(Y_2))$ .
- **Equilibrium interest rate decreases** from  $r_1$  to  $r_2$ .

2. In short run

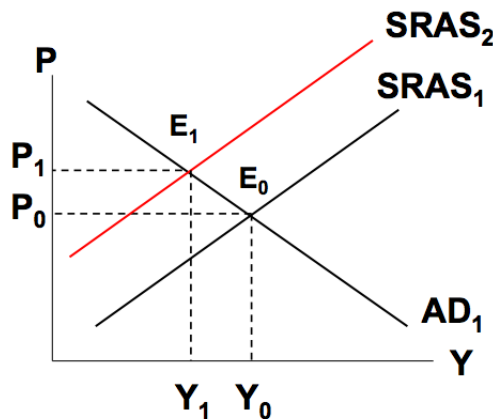
- If there is a big drought in agricultural production area in the northeastern part of Thailand, holding other things being equal what would be the effects on the economy overall price and national income based on the AD-AS model analysis?
- If central bank of the country wants to restore the original price level (before the big drought), explain possible monetary policy tools (four measures) that can stabilize the economy in terms of price level (diagram is not necessary).
- Based on monetary policy tools chosen in part (b), what would be the effects of the policy (on the economy price level, national income and interest rate). Explain and provide necessary diagrams [regarding, relevant market(s), IS-LM Model and AD-AS Model] to supplement your explanation.

**Answer**

- If there is a big drought in agricultural production area in the northeastern part of Thailand, holding other things being equal what would be the effects on the economy overall price and national income based on the AD-AS model analysis?

**Answer.**

- The big drought in agricultural production area in the northeastern part of Thailand would reduce Thailand **productivity, capacity to produce, availability of resources**.
- Aggregate supply reduces for all levels of price. Short-run aggregate supply curve shifts to the left.**



- At the original price, there is excess demand. **Price level increases** from  $P_0$  to  $P_1$
- Output decreases** from  $Y_0$  to  $Y_1$ .
- Such increase in price is **cost push inflation**.
- The situation where output decreases and inflation increases is called **stagflation**.

- If central bank of the country wants to restore the original price level (before the big drought), explain possible monetary policy tools (four measures) that can stabilize the economy in terms of price level (diagram is not necessary).

**Answer.**

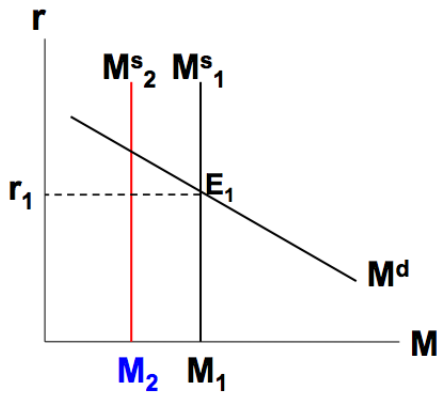
- If central bank wants to restore the original price  $P_0$ . The central bank need to **reduces aggregate demand**.
- To decrease aggregate demand the central bank need to apply contractionary monetary policy, **reduce money supply by**
  - open market operation : The central bank sells bonds
  - increase bank rate
  - increase minimum reserve requirement
  - print less money

- (c) Based on monetary policy tools chosen in part (b), what would be the effects of the policy (on the economy price level, national income and interest rate). Explain and provide necessary diagrams [regarding, relevant market(s), IS-LM Model and AD-AS Model] to supplement your explanation.

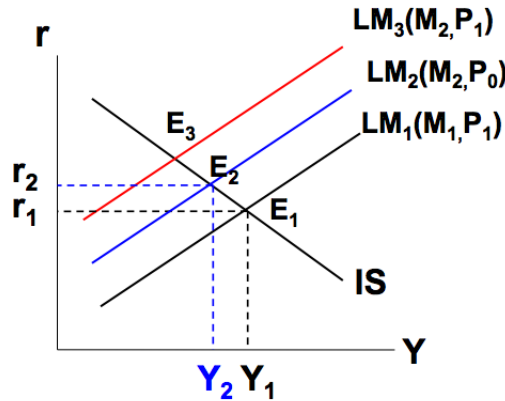
**Answer.**

- From question (a) and question (b), **initial equilibrium** in ADAS model is now at point  $E_1$  in graph 3. In the ISLM model, initial equilibrium is point  $E_1$  in graph 2. In the Money market, the initial equilibrium is point  $E_1$  in graph 1.
- Base on monetary policy tools chosen in part (b), **central bank reduces money supply.**
- Central bank reduces money supply, **money supply shifts to the left** from  $M_1^S$  to  $M_2^S$  in graph 1.
- Since money supply decreases, **LM curve shift to the left** from  $LM_1(M_1, P_1)$  to  $LM_3(M_2, P_1)$ .
- **Output decreases for all levels of interest rates and prices.**
- **Aggregate demand curve shifts to the left** from  $AD_1$  to  $AD_2$  in graph 3.
- **Output decreases** from  $Y_1$  to  $Y_2$ .
- **Price level decreases** from  $P_1$  to  $P_0$ , back to the original price level.
- Since price level decreases from  $P_1$  to  $P_0$ , **real money supply increases. LM shift to the right** from  $LM_3(M_2, P_1)$  to  $LM_2(M_2, P_0)$ .
- Overall, **the decrease in money supply causes interest rate to increases** (from  $r_1$  to  $r_2$ ). **Output to decreases** (from  $Y_1$  to  $Y_2$ ) and price level to decrease from  $P_1$  to  $P_0$ , back to the original price level.

**Graph 1**



**Graph 2**



Graph 3

