Exercise 7

AD-AS Model

1. Explain why AD is downward-sloping (that is, how AD is derived), using the money market diagram and the IS-LM.

2. What is Sticky Wage Theory? Explain why SRAS is upward-sloping (that is, how SRAS is derived), using the sticky wage theory, labor demand diagram, and production function.

3. Explain why LRAS is vertical.

4. **Cetaris Paribus** (other things equal), how will each variable/event affect each curve – shift (to which direction?) or movement?

Variable/Event	AD	SRAS	LRAS
P↑	movement	movement	-
G↓	shift left	-	-
T↓	Shift right	-	-
Autonomous C↑	shift right	-	-
Autonomous I↓	shift left	-	-
M_s↓→ i↑ →LM shift left M↓ P increase Y↓	Shift left	-	-
i↑	Shift left	-	-
SR Temporary epidemic (assuming AD unchanged)	No effect	Shift left	-
LR Permanent increase in population growth rate (assuming AD unchanged)	No effect	Shift Right	Shift Right
W↑	-	Shift left	-
Bad seasonal weather	-	Shift left	-
LR Permanent loss in agricultural land due to climate change	-	Shift left	Shift left
Discovery of new technology	-	Shift right	Shift right
Short-term worker training	-	Shift right	-
Permanent education reform	-	Shift right	Shift right

5. Suppose the economy faces a negative AD shock (e.g. loss in consumers' confidence).
   - What output gap do we have? Draw the AD-AS diagram to show the output gap at the new short-run equilibrium.

- If the government wants to correct such output gap, what policies can it implement? Give examples.
- If there is no government intervention, explain with the AD-AS diagram how the economy will return to the long-run equilibrium.

6. Suppose the economy faces a temporary, positive AS shock.
   - Give one example of a temporary, positive AS shock.
   - If there is no government intervention, explain with the AD-AS diagram how the economy will return to the long-run equilibrium.

7. Suppose the economy faces a permanent, negative AS shock.
   - Give one example of a permanent, negative AS shock.
   - If there is no government intervention, explain with the AD-AS diagram how the economy will return to the long-run equilibrium.

8. In macroeconomics, **Money Neutrality** is the idea that a change in the stock of money (M) does not affect real variables, like employment and real GDP. Is this true in the AD-AS model?
   (**Hint**: When the central bank changes money supply, M, does this affect output in the long run, i.e. full-employment Y?)

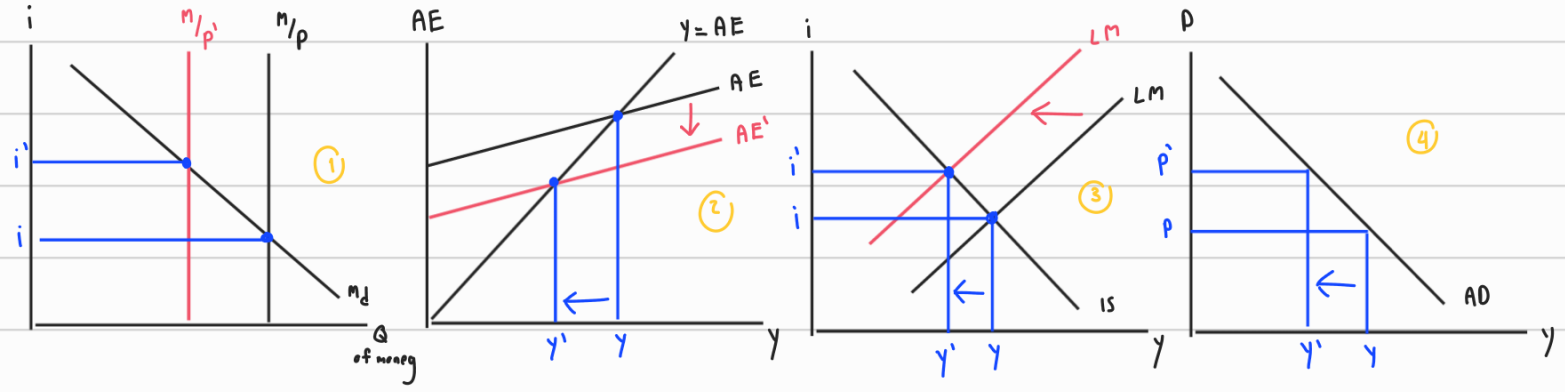
9. Based on Question 8 above, what can the government do to change output in the long run?
   (**Hint**: Monetary and Fiscal Policies are demand-side policies, but do we have other alternatives?)

10. Economists usually have macroeconomic goals of low employment and low inflation. It is also believed that economists face the trade-off between these goals, especially in short run. Use relevant diagrams to explain the trade-off. Why does the trade-off no longer exist in long run?

11. *** The IS-LM is for short-run analysis, while the AD-AS is for long-run analysis. Now, let's link them together. Suppose the government implements expansionary fiscal policy. Use the IS-LM and AD-AS models to show the policy effect in both short run and long run.
    (**Hint**: In long run, what happens to P in the AD-AS model? How will this change in P affect the IS-LM model?)

1. Explain why AD is downward-sloping (that is, how AD is derived), using the money market diagram and the IS-LM.

The diagram below represent why AD is downward sloping



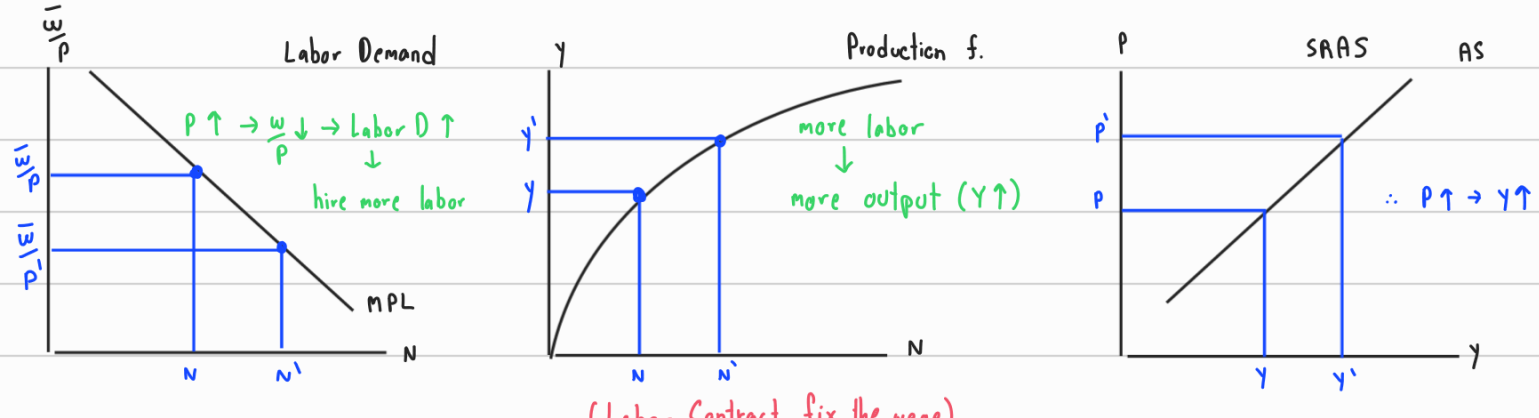
As P↑ → Y↓ ; When P ↑

MM: P↑ → $M_{/P}$ ↓ → i ↑ ① ; LM shift left } ③ ∴ P↑ → Y↓ ④

GM: i ↑ → I↓ → AE ↓ → Y ↓ ② ; IS movement

2. What is Sticky Wage Theory? Explain why SRAS is upward-sloping (that is, how SRAS is derived), using the sticky wage theory, labor demand diagram, and production function.

Note ; $\frac{w}{P}$ = real wage



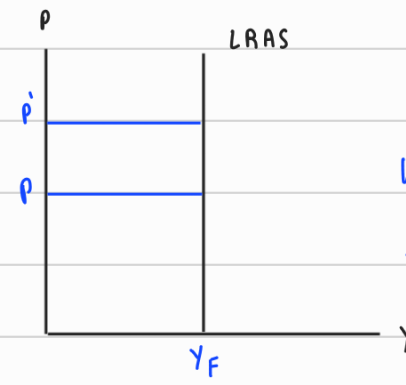
(Labor Contract fix the wage)

When P↑, the real wage ($\frac{w}{P}$) ↓ due to fix ↓ wage. Because real wage is lower, firm can demand more labor, so firm hire more labor. When firm hire more labor, the output (Y) ↑

We can write the relationship as → P↑ → $\frac{w}{P}$ ↓ → labor D. ↑ → N ↑ → Y ↑ [it is positive relationship]

Sticky Wage theory: An economic concept describing how wages adjust slowly to change in labor market condition.

3. Explain why LRAS is vertical.

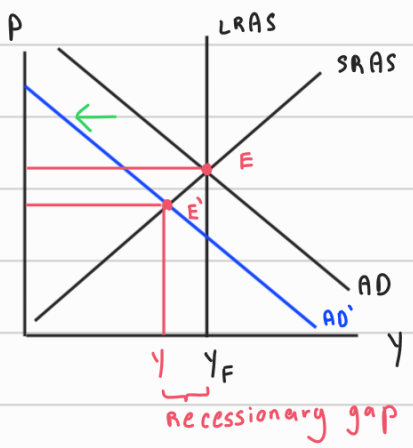


In the longrun, w (wage) is flexible that mean it can adjust so not sticky

When P↑ → W↑, so real wage ($\frac{w}{P}$) is unchange. $\frac{w}{P}$ same → Output (Y) still same

∴ Y is unchange ; In long-run: As P↑ → Y same.

5. Suppose the economy faces a negative AD shock (e.g. loss in consumers' confidence).
   - What output gap do we have? Draw the AD-AS diagram to show the output gap at the new short-run equilibrium.

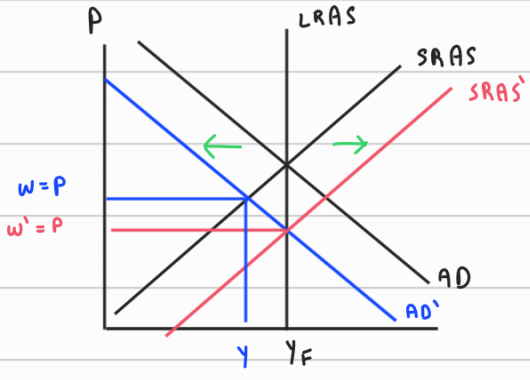


Due to negative Demand shock, make AD shift to the left so E move from E to E' (lower P and Y). After E change Y is lower ∴ cause recessionary gap ; $Y < Y_F$ in SR

- If the government wants to correct such output gap, what policies can it implement? Give examples.
- If there is no government intervention, explain <u>with the AD-AS diagram</u> how the economy will return to the long-run equilibrium.

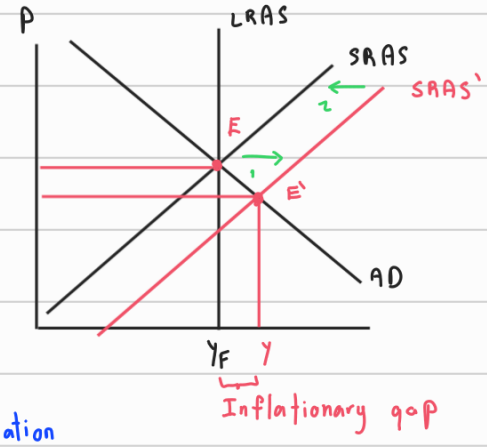
First Question: Government can use expansionary fiscal policies (Either G↑, T↓). AD will shift to the right to the normal E as before which Y↑ to Y_F.

Second Question:



If there is no govt. intervention, the economy will slowly adjust itself ∵ in long run, wage is flexible and now economy is produce at $Y < Y_F$ and $U > U_N$. So the firm need to lower wage follow P to increase production to Y_F and hire more labor to maximizing profit.

6. Suppose the economy faces a <u>temporary, positive</u> AS shock.
   - Give one example of a temporary, positive AS shock.
   - If there is no government intervention, explain <u>with the AD-AS diagram</u> how the economy will return to the long-run equilibrium.

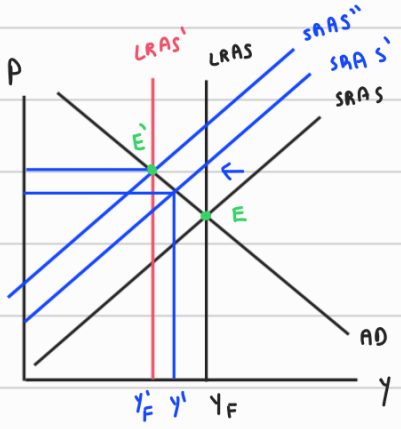


First Question: Temporary positive AS shock = SRAS shift right

Ex: Goverment reduce company tax 1 year (Y↑)
↳ $Y > Y_F$

Second Question: If the regulation does not effective the SRAS' will shift back to SRAS by itself ∵ it is temporary regulation is no longer use. So Y move Back to Y_F

7. Suppose the economy faces a permanent, negative AS shock.
   - Give one example of a permanent, negative AS shock.
   - If there is no government intervention, explain with the AD-AS diagram how the economy will return to the long-run equilibrium.

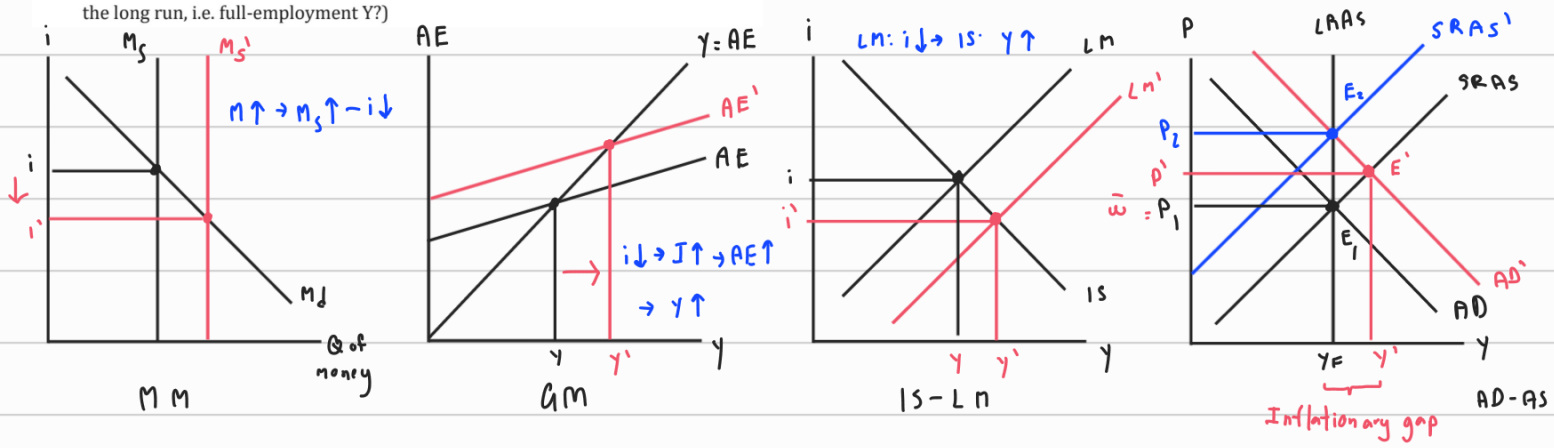


First Question: Permanent negative AS shock = Shift LRAS & SRAS to left

Ex: A sudden decrease gosoline

Second Question: If goverment didn't intervene some policy, SRAS will shift left and LRAS will shift left follow to make E from E to E' which higher inflation and low Y_F

8. In macroeconomics, **Money Neutrality** is the idea that a change in the stock of money (M) does not affect real variables, like employment and real GDP. Is this true in the AD-AS model?
(**Hint**: When the central bank changes money supply, M, does this affect output in the long run, i.e. full-employment Y?)

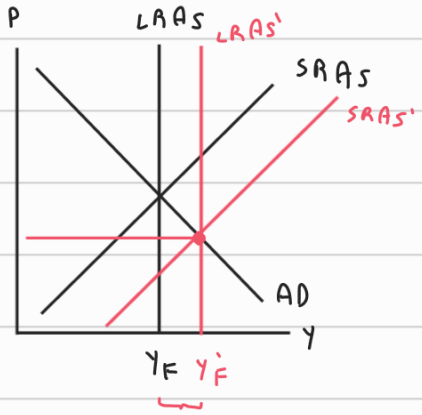


- In MM, M↑ make M_S↑ then i↓ ; In GM, when i↓ make I↑ so AE↑ then output (Y)↑ IS-LM, ∴ i↓ from MM make LM shift right ∴ Y↑.

- ∵ LM shift right but P is constant, so AD shift right, SRE at E'. In short run wage are sticky that mean firm pay wage at $\bar{w}$ but P↑ to P' that mean real wage falls, firm hire more labor from Y_F to Y'. At E' output is over Y_F ($Y > Y_F$). Inflation gap occured at E'.

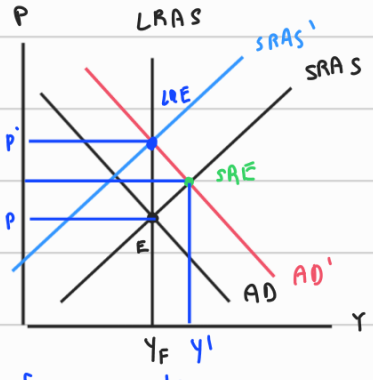
- In long-run, wage is flexible that make firm need to pay higher wage than shortrun. When w↑ the production cost is higher, so firm will lay-off some labor and output are slowly decrease from Y' to Y_F (Inflationary gap gone). When Labor decrease, SRAS slowly shift left till E_2 ⇒ $Y = Y_F$ and P↑ to P_2

9. Based on Question 8 above, what can the government do to change output in the long run?
(**Hint**: Monetary and Fiscal Policies are demand-side policies, but do we have other alternatives?)



In long-run if the goverment want to increase output want to increase output, they can use supply-side policy to boost output by the quality of FoP such as education due to it will improve quality and quantity of FoP to be more productive ∴ labor can produce more output [Whole econ → P↓ → Y ↑]

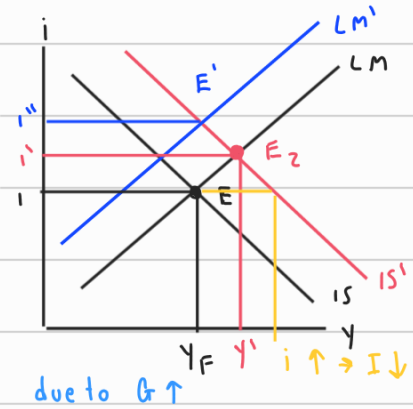
10. Economists usually have macroeconomic goals of low employment and low inflation. It is also believed that economists face the trade-off between these goals, especially in short run. Use relevant diagrams to explain the trade-off. Why does the trade-off no longer exist in long run?

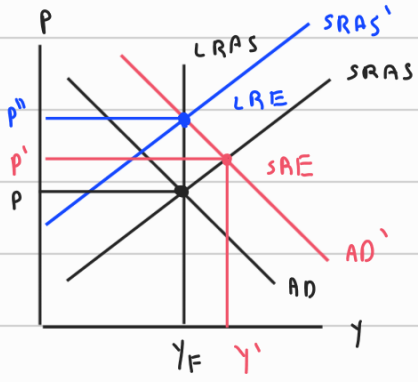


In short-run when AD↑ that cause SRE in higher P (inflation) and higher Y (employment) because wage is fixed that mean real wage is lower so firm can hire more workers due to real wage↓. From this situation we can see that economic growth by increase demand of people are trade off with goal of economits.

In long run wage is flexible that mean firm need to pay higher wage for workers following the price level, as a result firm can't hire more labor doe to the real wage is same as before, so firm can produce output at the same rate as usual at Y_F and P↑ to P'.

11. *** The IS-LM is for short-run analysis, while the AD-AS is for long-run analysis. Now, let's link them together. Suppose the government implements expansionary fiscal policy. Use the IS-LM and AD-AS models to show the policy effect in both short run and long run.
(**Hint**: In long run, what happens to P in the AD-AS model? How will this change in P affect the IS-LM model?)





Let say G↑ (Expansionary fiscal policy) that shift IS curve due to G↑, also with AD shift right due to G↑

Short-run: At SRE, P (Price level) ave increase due to fix wage ($\bar{w}$). Firm can produce more with lower cost of production that make Y↑ At E_2, i is higher ∴ reduce I so Y is at Y' but in overall Y (output) increase.

Long run: When Price↑ → Affect MM (money market) which $\frac{M}{P}$ or M_S↓, so LM shift Left that cause higher i and Y decrease. Also Long-run, wage is flexible, as P↑ wage also↑ that cause production cost increase which make SRAS shift left. When SRAS shift left to LRE, output decrease back to Y_F but P is increase.