

Aggregate demand and Aggregate supply analysis

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Up to this point

- We have analyzed the determination of output using the **IS-LM model**.
- The idea is simple
 - Firms produce output to match with the level of aggregate expenditure
 - The expenditure is determined interest rate, which in turn is affected by the level of output
 - This generates the simultaneous determination of “ r ” and “ y ”

Up to this point

- The model assumes that price is fixed, and therefore has no any discussion about how “price” of G&S is determined.
 - Price = overall prices (consumer price index)
- Understanding the price determination is important.
 - Thinking about inflation and deflation issue that concern most people

Up to this point

- This section is to understand the role of price in the macroeconomy, and how price is determined in the macroeconomy
- To understand this issue, economists use the concept of **AD-AS model**

AD-AS model

- The model is built upon the idea that **price affects quantity demanded and quantity supplied**
 - Quantity demanded is referred to aggregate spending, or the amount of G&S / output that people can afford (overall combined)
 - Quantity supplied is referred to the level of output that producers/firms choose to produce and sell to market (overall combined)

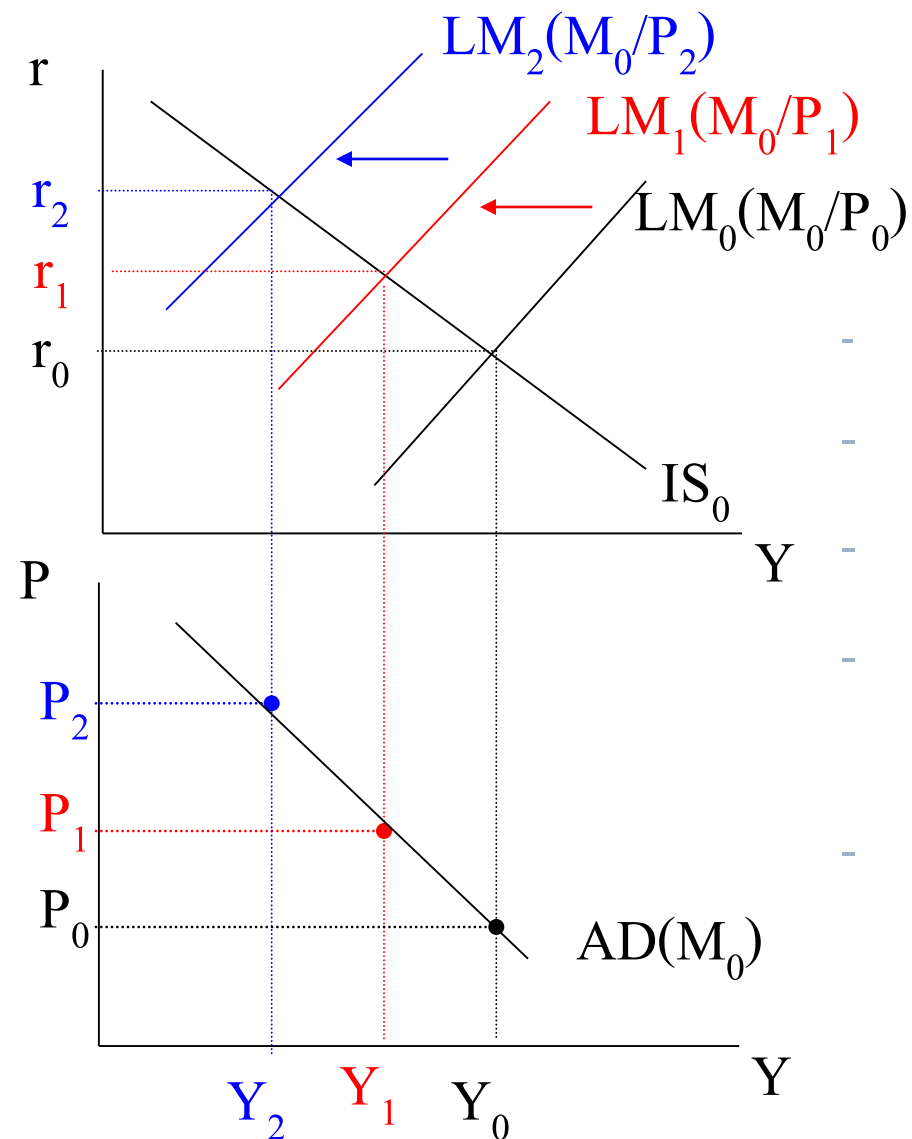
Behavior of aggregate demand

- Quantity of demanded for G&S (output) is negatively related to price
 - Higher price → lower quantity demanded
- Aggregate demand is then downward sloping

Deriving aggregate demand curve

- Economists derive the aggregate demand curve by linking to the IS-LM model
- Higher price causes the followings
 - A lower in real money supply (for given nominal money supply)
 - Interest rate tends to rise along with
 - Consumption/investment spending tend to fall
 - Lower quantity of G&S demanded

Deriving the aggregate demand: Graphical illustration



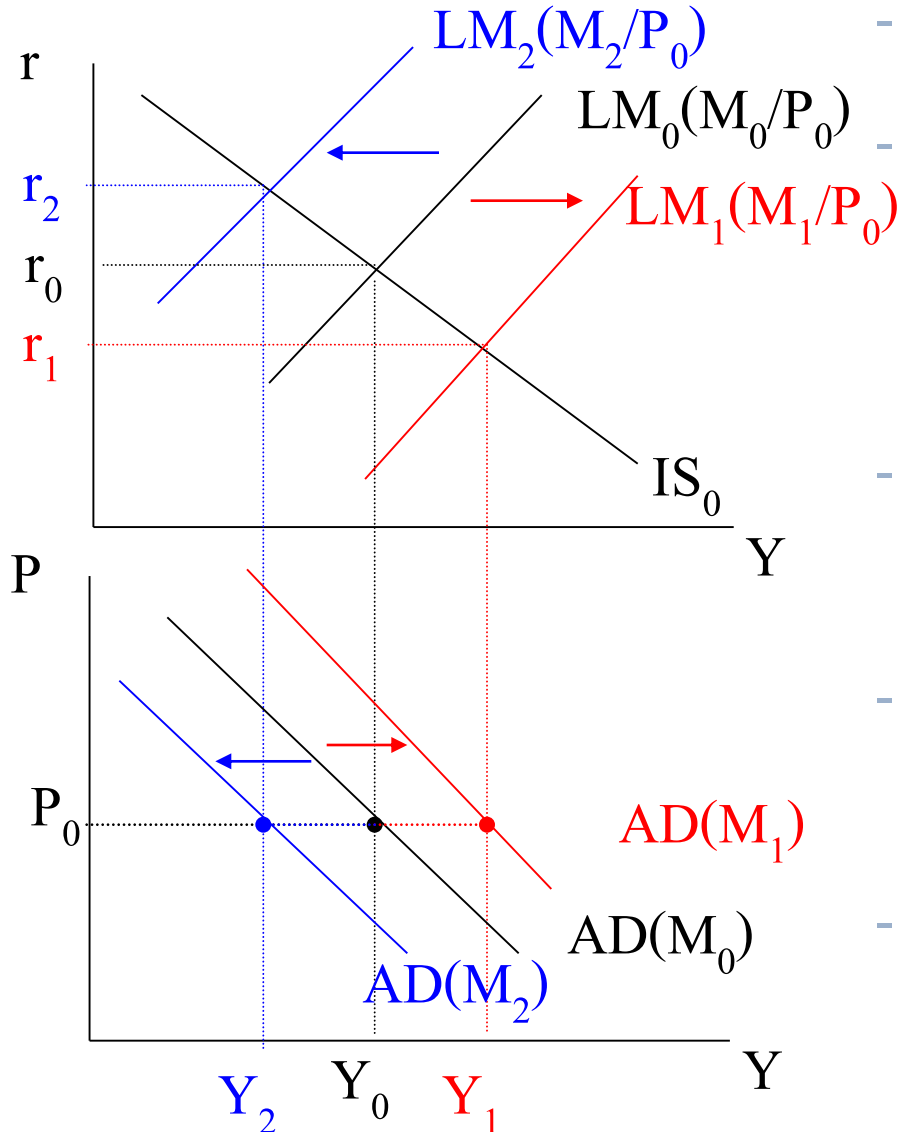
- Given a fixed level of nominal money supply (M_0)
- $P_2 > P_1 > P_0$
- $(M_0/P_2) < (M_0/P_1) < (M_0/P_0)$
- Rising price $\rightarrow$ real money supply lowered $\rightarrow$ LM shifted left $\rightarrow$ interest rate rising
- Rising interest rate causes lower consumption / investment spending, and hence the equilibrium quantity of output determined by the aggregate expenditure

Determinants of Aggregate demand

- Price is one of the determinant of aggregate demand
 - Change in price causes the movement along the curve
- As AD is affected by many other factors; their change can affect the AD by shifting the AD curve.
- Since the AD is determined by factors affecting IS and LM curve, factors affecting IS/LM curve will affect the aggregate demand
 - Factors that increase the equilibrium output in the IS-LM model will shift AD to the right
 - Factors that reduce the equilibrium output in the IS-LM model will shift AD to the left

Factors affecting AD curve

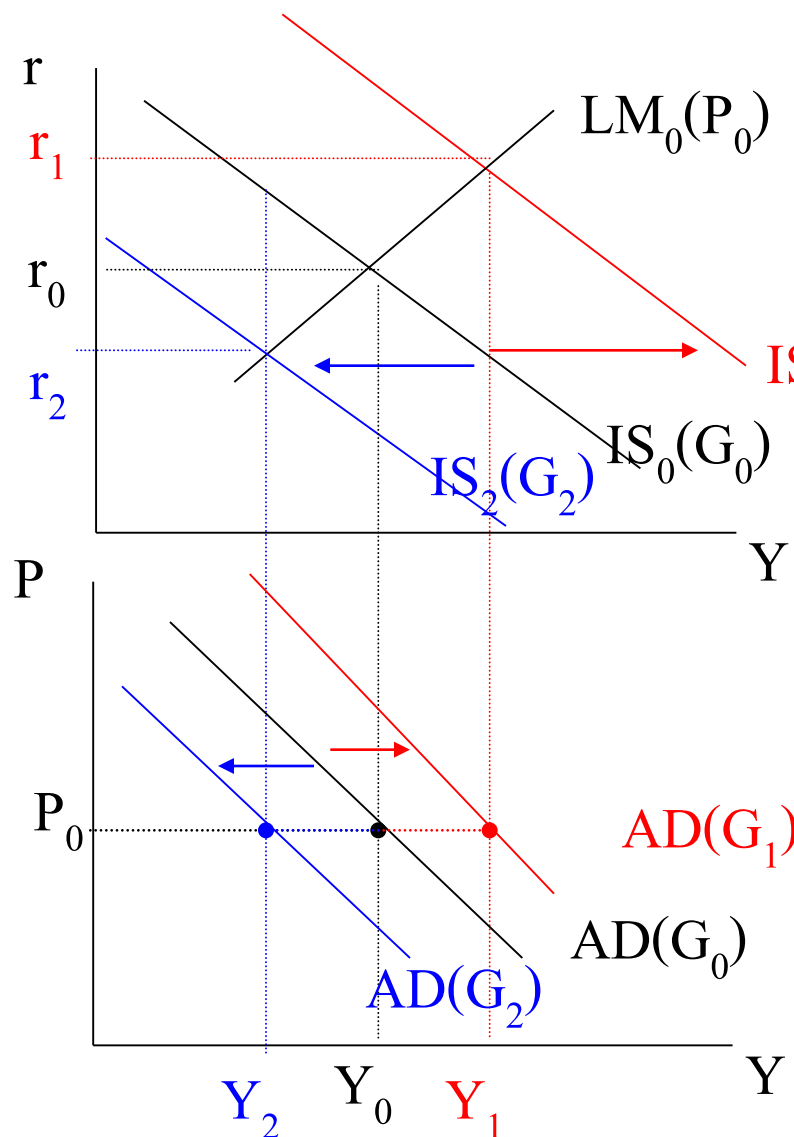
1. Increase in money supply



- Suppose that price is fixed equal to P_0
- Increase in money supply (M_1) will increase the real money supply, causing LM to shift right.
- Equilibrium output increases from Y_0 to Y_1
- Having considered this for any level of price, Y is higher; AD curve shifts right
- Lower the money supply (M_2) will cause LM to shift left ... **AD shift left**

Factors affecting AD curve

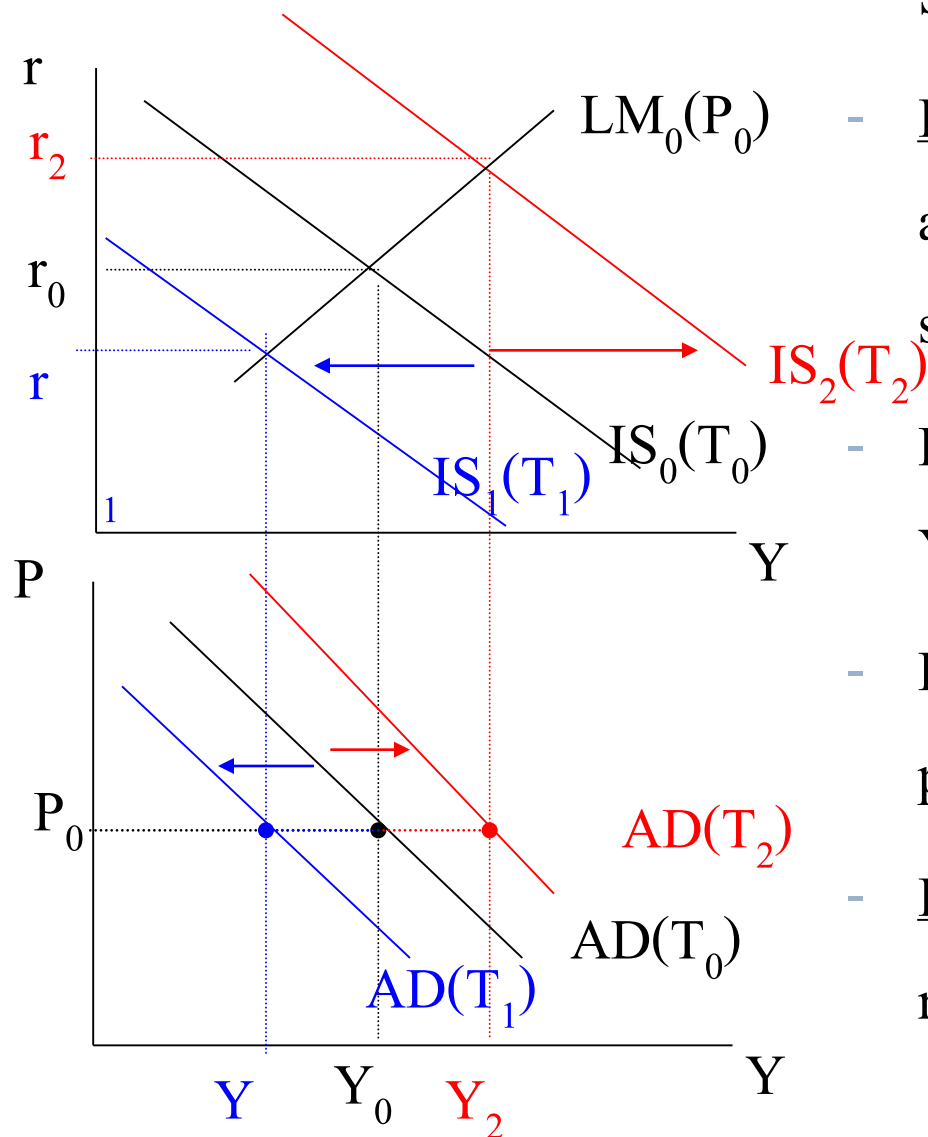
2. Increase in government expenditure



- Suppose that price is fixed equal to P_0
- Increase in G (G_1) will increase the aggregate expenditure, causing IS to shift right.
- Equilibrium output increases from Y_0 to Y_1
- Having considered this for any level of price, Y is higher; AD curve shifts right
- Lower in G (G_2) will cause IS to shift left ... **AD shift left**

Factors affecting AD curve

3. Raising tax collection



- Suppose that price is fixed equal to P_0
- Increase in T (T_1) will lower the aggregate expenditure, causing IS to shift left.
- Equilibrium output drops from Y_0 to Y_1
- Having considered this for any level of price, Y is higher; AD curve shifts left
- Lower in T (T_2) will cause IS to shift right ... **AD shift right**

Factors affecting AD

4) Change in autonomous expenditure / Factors affecting real money demand

Policy effect on aggregate demand

Monetary policy

Expansionary(increasing money supply) LM shift right AD shift right

Contractionary(reduce money supply) LM shift left AD shift left

Fiscal policy

expansionary (increase G or cut T) IS shift right AD shift right

contractionary (cut G or raise T) IS shift left AD shift left

Behavior of aggregate supply

- Firms choose the level of output supplied to the market; choice of output decision
- Economists have three versions of aggregate supply concept; *very short-run, short-run and long-run* aggregate supply

Very Short-run aggregate supply

- Under the **very short-run scenario**, firms cannot adjust price; price is fixed
- Firms choose to produce as much output as market wants
- The very short-run aggregate supply is **a horizontal curve**

Short-run aggregate supply

- **Short-run aggregate supply:** Firms choose to produce more when price increases
- Economists consider the role of firms as a production unit; hire **workers** to produce G&S using **firms' technology of product**
- Firms' decision is to choose the level of production that **maximize the profit**

Short-run aggregate supply

- In the **short-run**, worker's wage is typically fixed.
- So, higher price then incentivizes firms to produce more as they can earn more profit
- As a result, aggregate quantity supplied increases; the **aggregate supply curve is upward sloping**

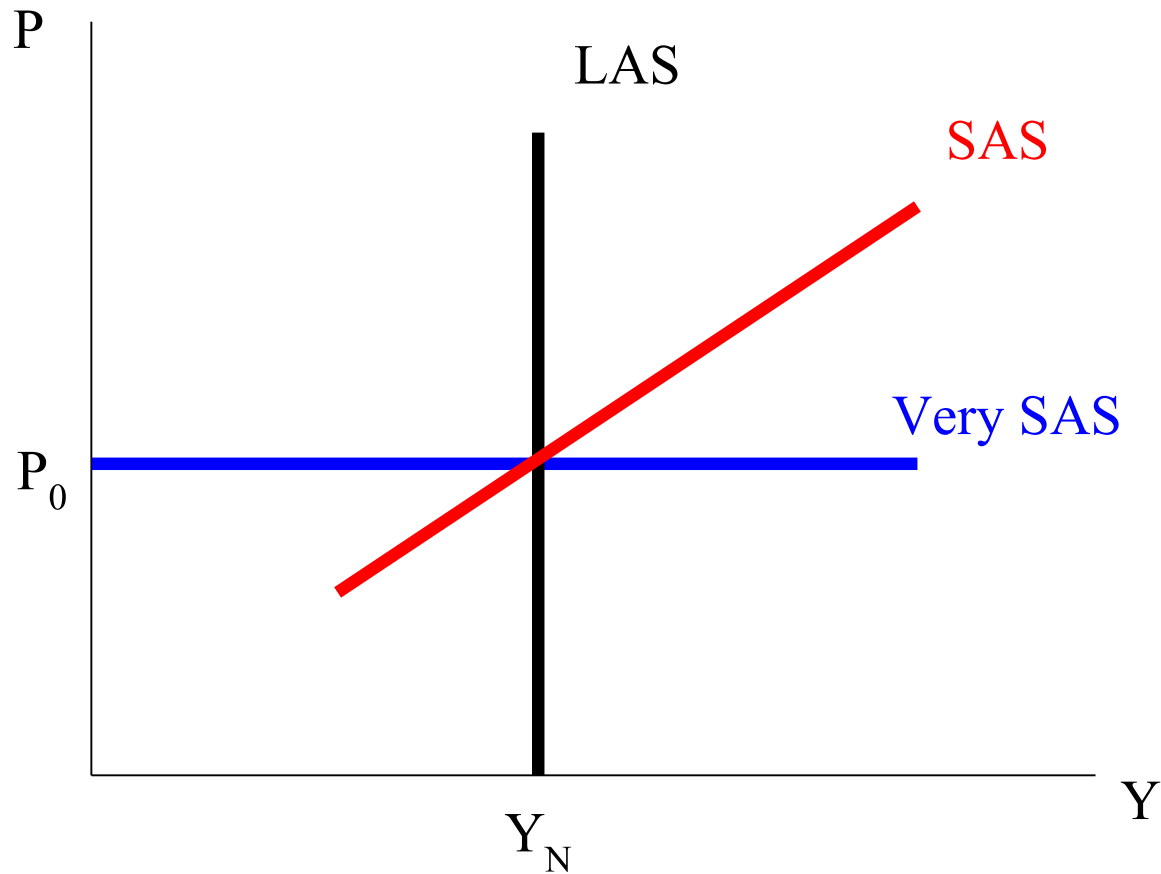
Long-run aggregate supply

- However, in **the long-run**, supply curve is independent of price.
- Increase in the price will NOT lead to the increase in the output supplied as wage will normally catch up with the rising price
- No extra profit can be made from expanding the level of output beyond the current level

Long-run aggregate supply

- Economists believe that the long-run level of output will be determined by the **maximum capacity of production technology** and **available resources** (workers/lands/capital etc.)
- The level of output is called “**potential output**” or “**full-employment output**” or “**natural rate of output**” (Y_n)
- In the long-run, firms will always produce at the potential level

Graphical illustration of three versions Aggregate supply



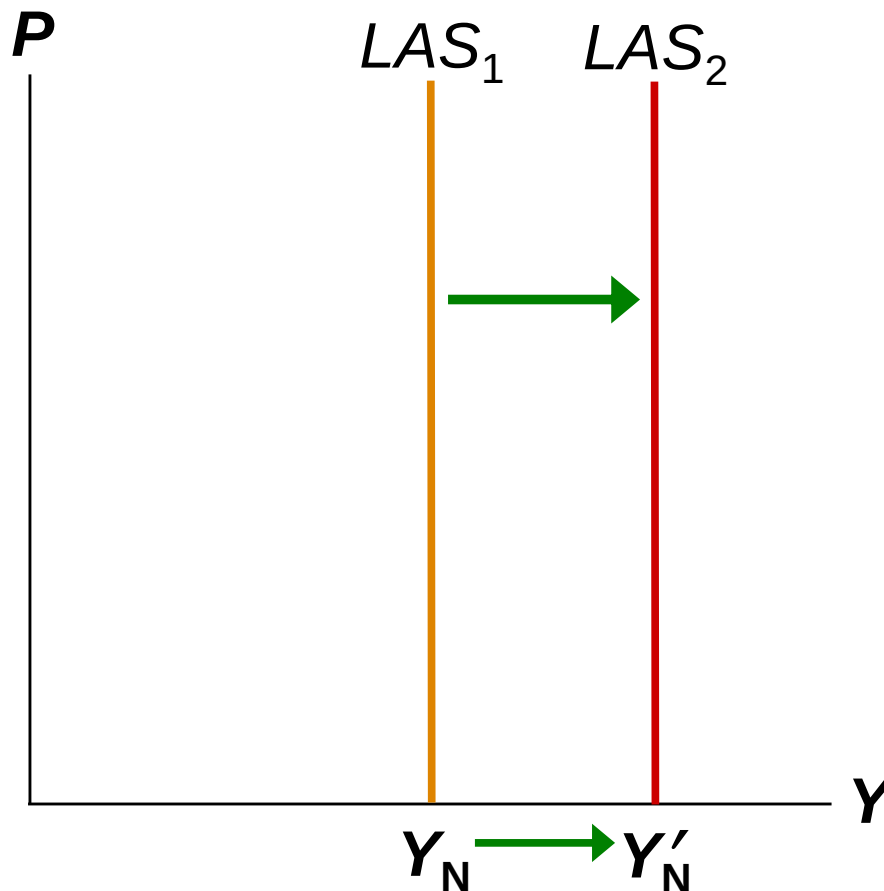
Factors affecting aggregate supply

- The long-run aggregate supply curve can be affected by “the level of production technology” and “the amount of resource available”
 - e.g. Physical resources / Human resources / Natural resources
- **Better technology, more resource shift the long-run AS curve to the right**

Why the *LRAS* Curve Might Shift

Any event that changes any of the determinants of Y_N will shift *LAS*.

Example:
Immigration increases L , causing Y_N to rise.



Factors affecting aggregate supply

- In the **short-run**, there can be as many number of factors as those affecting the LAS curve
- In the short-run, this also includes “**price of inputs**” and “**cost of production**”
- Higher cost production will generally shift the SAS curve up, leading to a higher price for the same level of output supplied

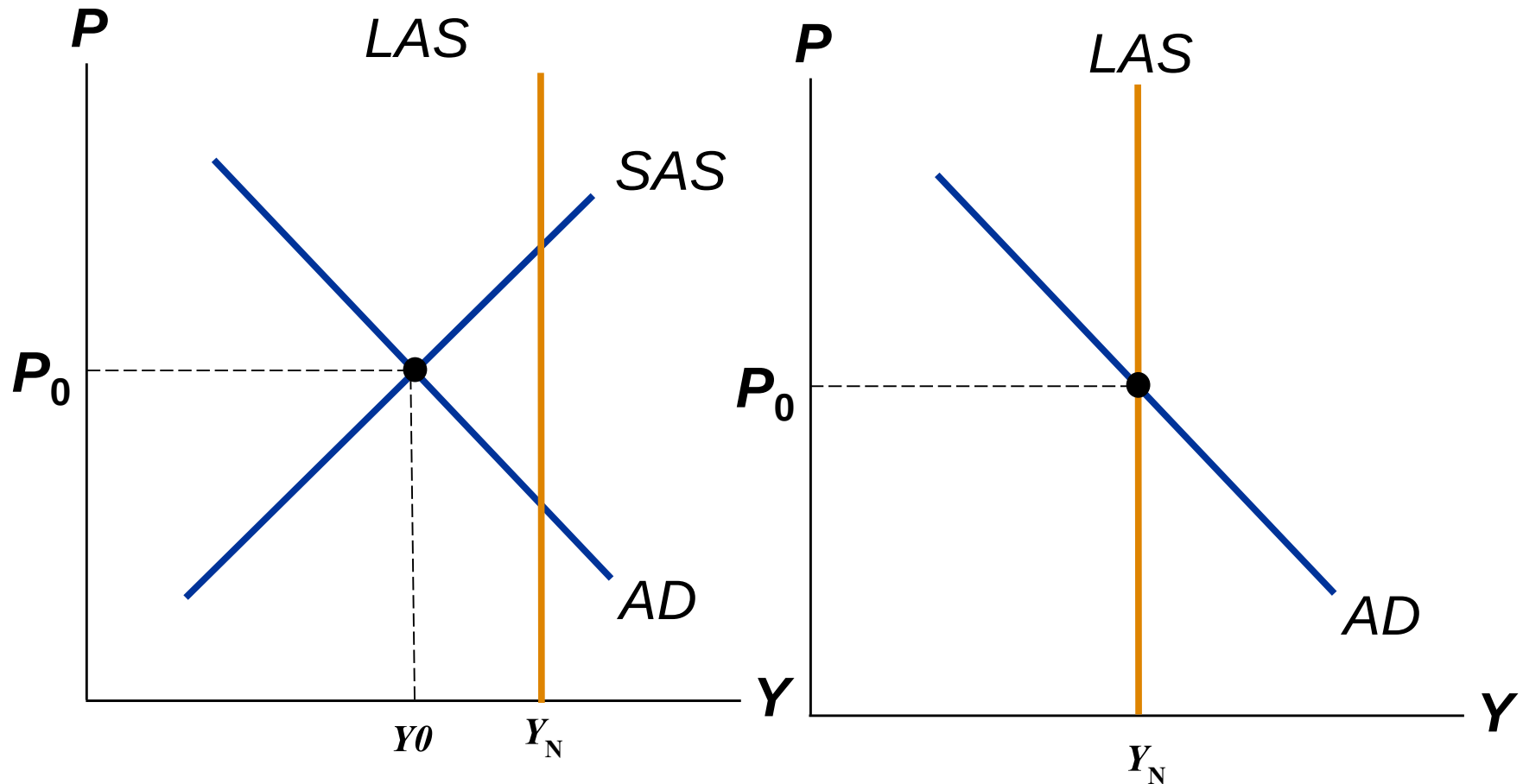
AD-AS equilibrium

- Equilibrium occurs when aggregate demand is equal to aggregate supply ($AD = AS$)
- This results in **equilibrium price** and **equilibrium (aggregate) output**

AD-AS equilibrium

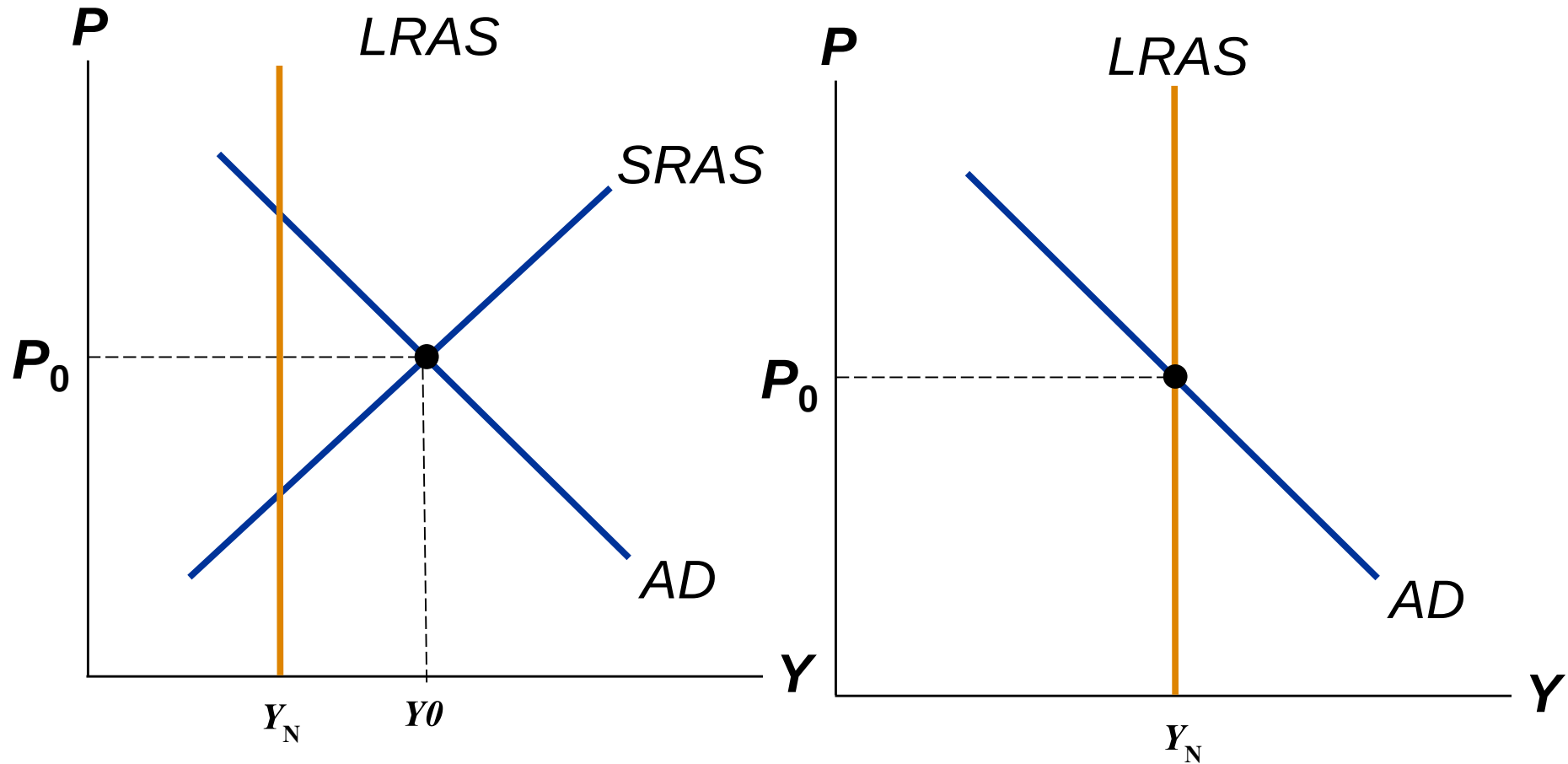
- Since we have two versions of AS, our equilibrium concept can then be defined into two ways
 - Short-run equilibrium
 - When $AD = SAS$
 - Long-run equilibrium
 - When $AD = LAS = SAS$

The Short-run v.s. Long-run Equilibrium



Short-run equilibrium = Unemployment

The Short-run v.s. Long-run Equilibrium



Short-run equilibrium = Over-employment of resource

Changes in the AD-AS equilibrium

- Changes in AD-AS equilibrium can occur by factors affecting AD and AS curve
- For example, an improvement in business sentiments can cause an increase autonomous investment, and hence leading to an increase in AD.

Changes in the AD-AS equilibrium

- Effect of an improvement in business sentiments: **short-run equilibrium**

Changes in the AD-AS equilibrium

- Effect of an improvement in business sentiments: **Long-run equilibrium**

Changes in the AD-AS equilibrium

- Effect of a temporary oil price increase:
short-run equilibrium

Changes in the AD-AS equilibrium

- Effect of a temporary oil price increase:
Long-run equilibrium

What do we observe about the price?

- Price increases in both cases
- The increase in price is referred to **“inflation”**
- Inflation can occur because of two reasons: **demand and supply factor**

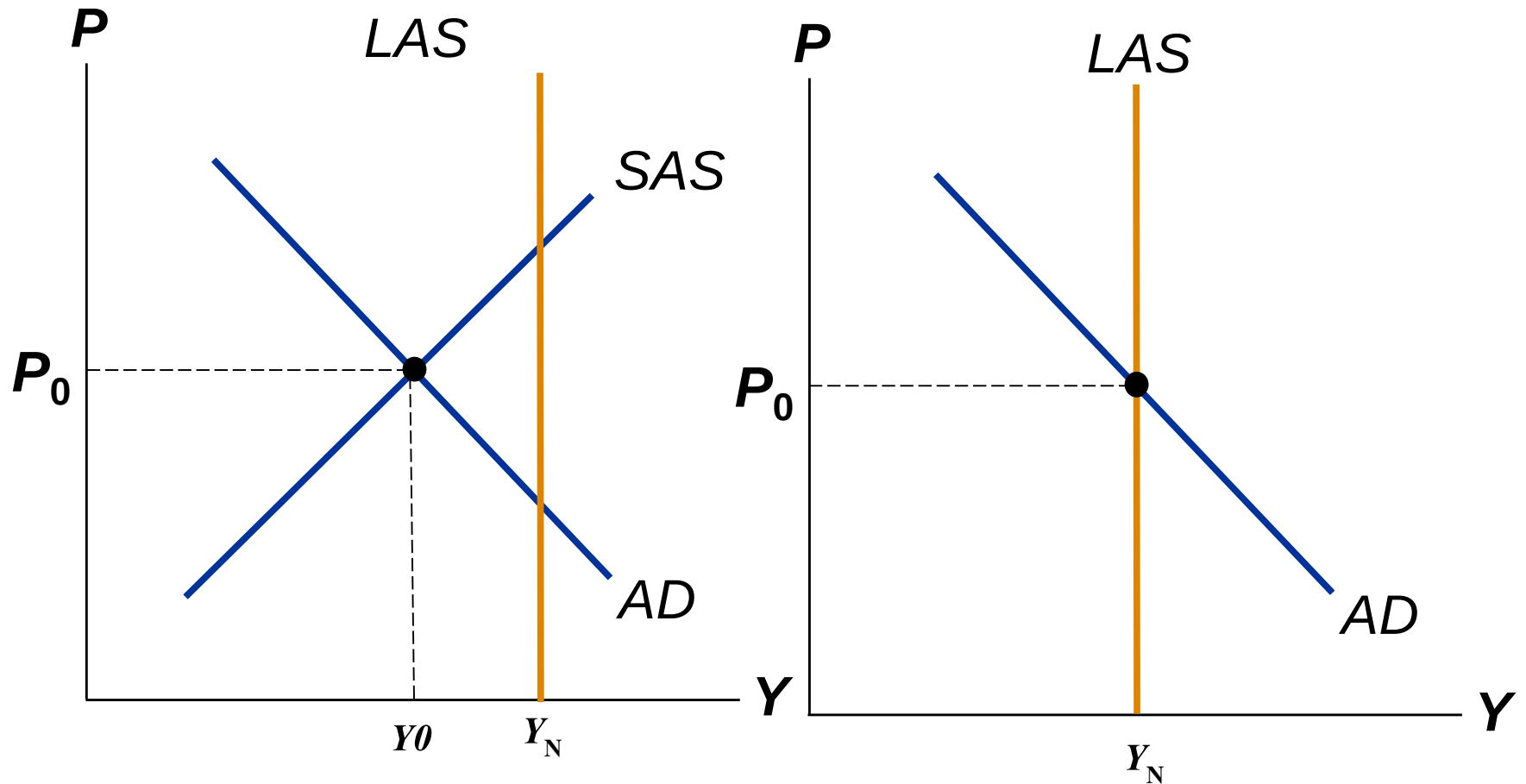
Types of inflation

- Demand-driven inflation (Demand pull inflation)
 - Accompanied with economic boom
 - Higher employment / Lower unemployment rate
- Supply-driven inflation (cost push inflation)
 - Sometimes, called **“Stagflation”**
 - Accompanied with recession
 - Higher unemployment rate

Policy analysis in the AD-AS model

- In the short-run, we might experience a recession or an economic boom
- Policymaker can fix the economic problem by using **fiscal and monetary policy**
- The effect of such policy can be captured by the AD-AS model
- Expansionary monetary / fiscal policy will cause an increase in the aggregate demand, and hence output in the short-run.

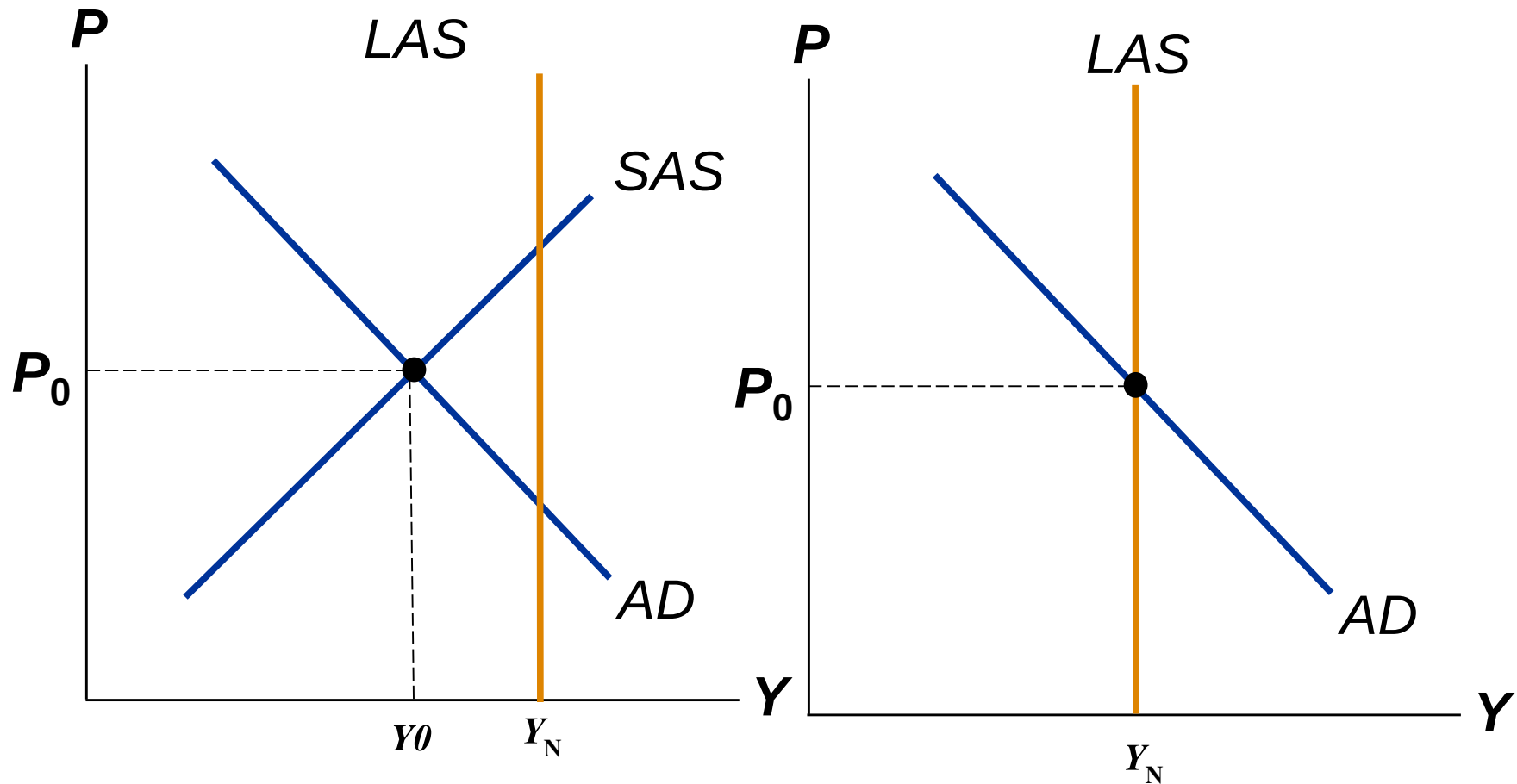
Policy effect in the short-run



Policy effect and the Phillips relation

- To increase the output, policymaker stimulates the economy
 - This lowers the unemployment rate
- The sided effect is that policymaker faces with inflation
- Economists consider this trade-off relationship that occurs in the short-run
- This is so called the “**Philips relation**” or “**Phillips curve**”

Policy effect in the long-run



Policy effect in the long-run

- Fiscal and monetary policy are neutral in the long-run
- Policymaker faces no trade-off relationship in the long-run
- There is no such thing as a downward sloping Phillips curve