Monetary Policy Theory

This lecture uses the aggregate demand (AD) and aggregate supply (AS) framework to examine the role of monetary policy in creating inflation and stabilizing the economy.

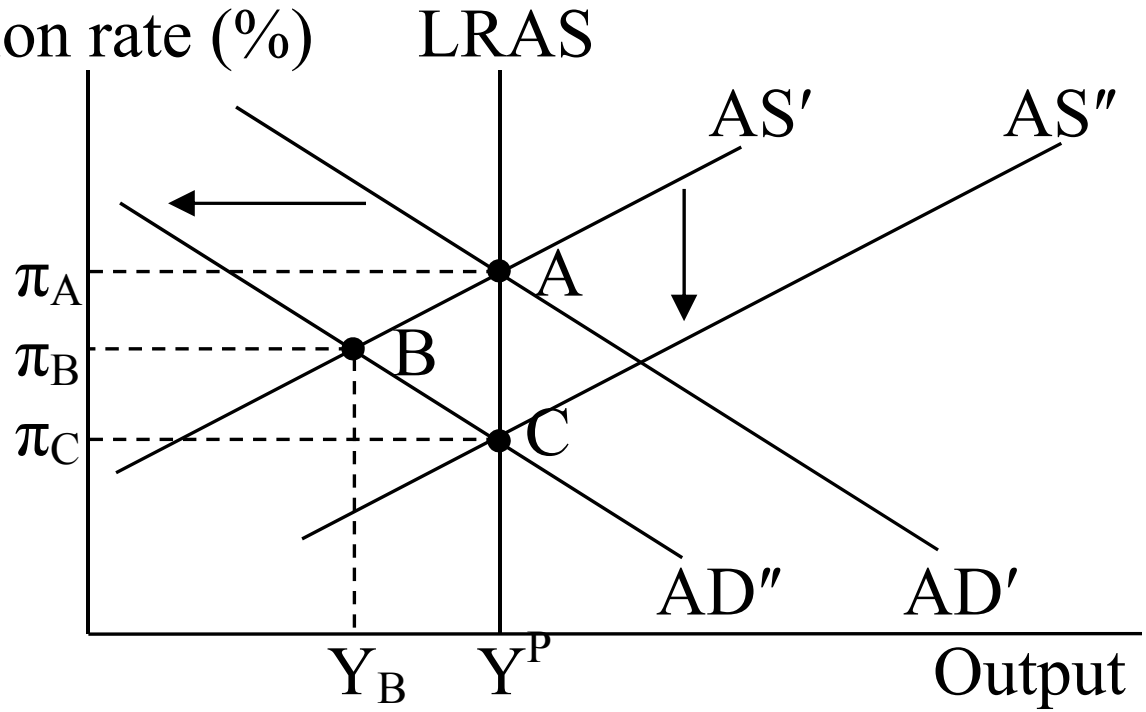
Monetary Policy's Response to AD and AS Shocks

A. The objectives of monetary policy

1. Minimize the inflation gap ($\pi - \pi^*$)
    a. The inflation gap is the actual inflation rate (π) minus the central bank's inflation rate target (π^*).
    b. Most central banks set π^* between 1% and 3%.
2. Minimize the output gap ($Y - Y^P$)
    a. The output gap is the difference between actual output (Y) and potential output (Y^P).

B. Two Ways Monetary Policy Responds to a Negative AD Shock

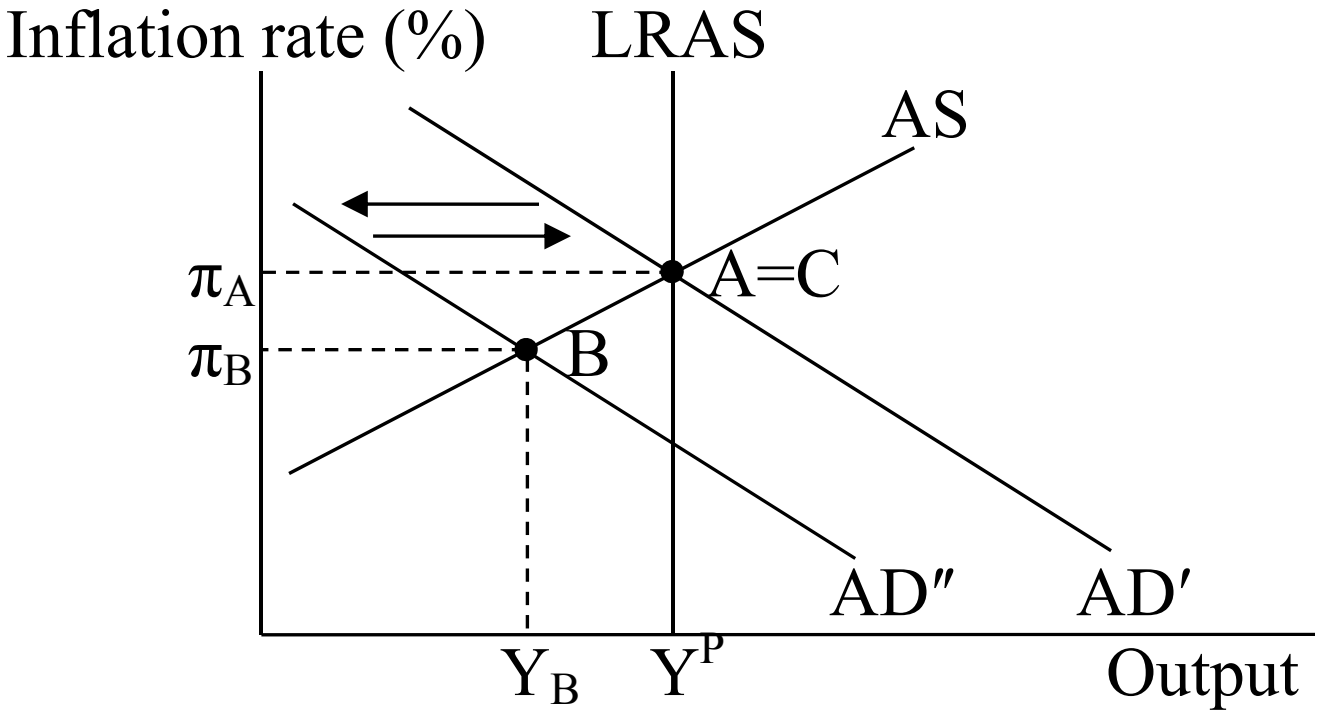
1. No monetary policy response – "Do nothing"



a. In the short run, an AD shock causes $\pi\downarrow$ and $(Y < Y^P)$. [AD curve shifts left to point B.]

b. In the long run, $\pi^e\downarrow$, which causes $\pi\downarrow$ and $(Y = Y^P)$. [AS curve shifts down to point C.]

2. Monetary policy is eased to stabilize output and inflation.



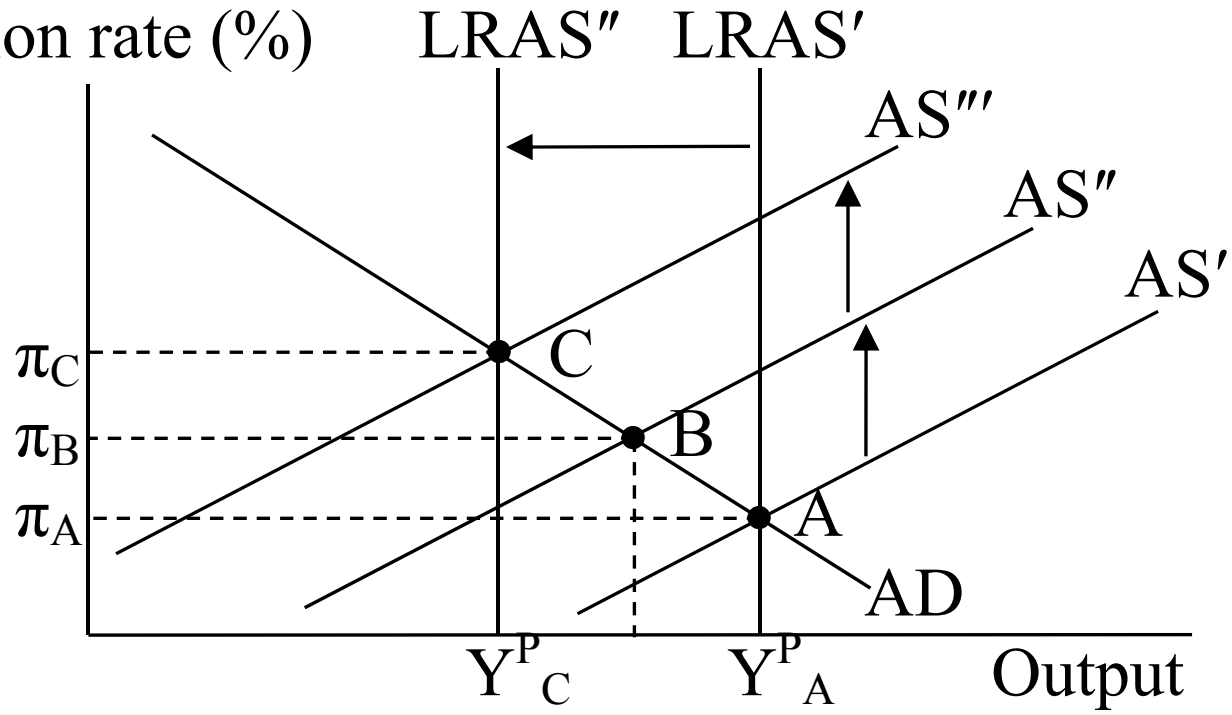
a. An AD shock causes $\pi\downarrow$ and ($Y < Y^P$). [AD curve shifts left to point B.]

b. The central bank eases policy, which returns π and Y to π_A and Y^P. [AD curve shifts right to point C.]

c. No tradeoff exists between the output and inflation objectives.

C. Two Ways Monetary Policy Responds to a Negative LRAS Shock [LRAS curve shifts left.]

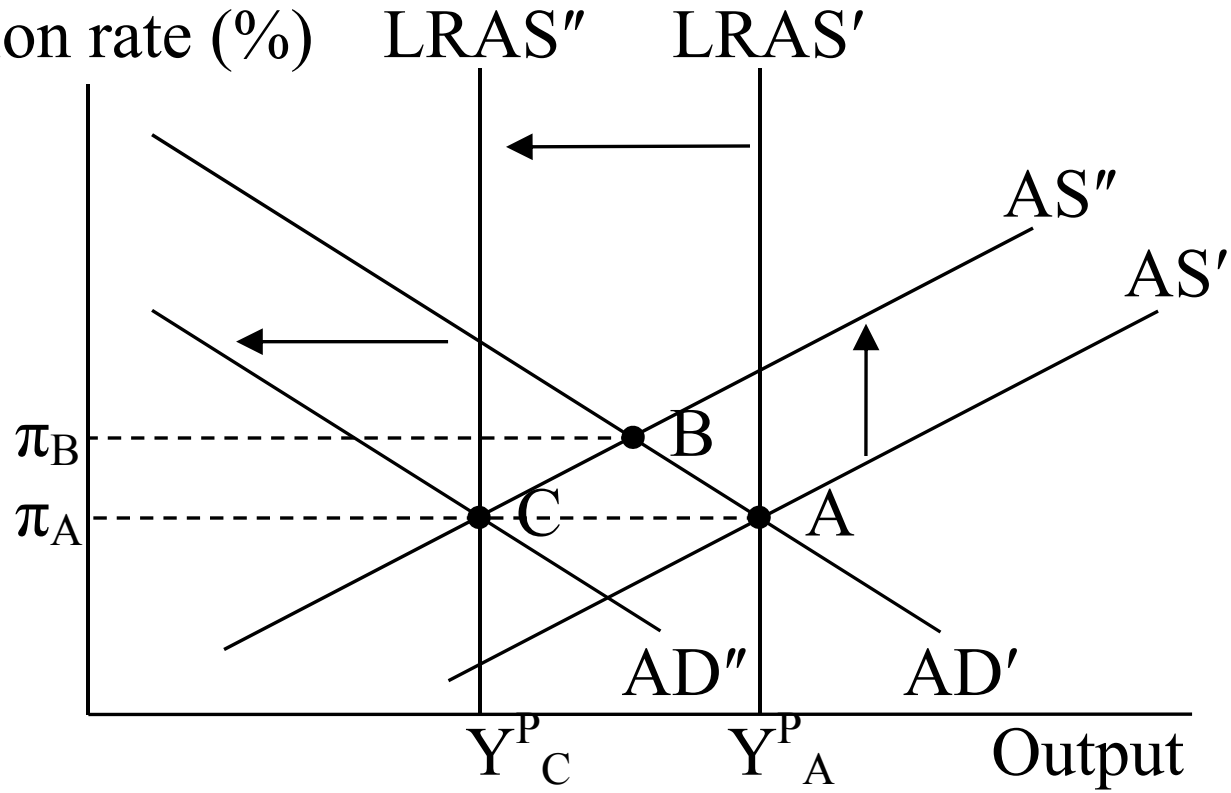
1. No monetary policy response – "Do nothing"



a. In the short run, a LRAS shock causes $Y^P \downarrow \rightarrow (Y > Y^P) \rightarrow \pi\uparrow$. [AS curve shifts up to point B.]

b. In the long run, $Y\downarrow \rightarrow \pi\uparrow$ until $Y = Y^P$. [AS curve shifts up to point C.]

2. Monetary policy is tightened to stabilize inflation.



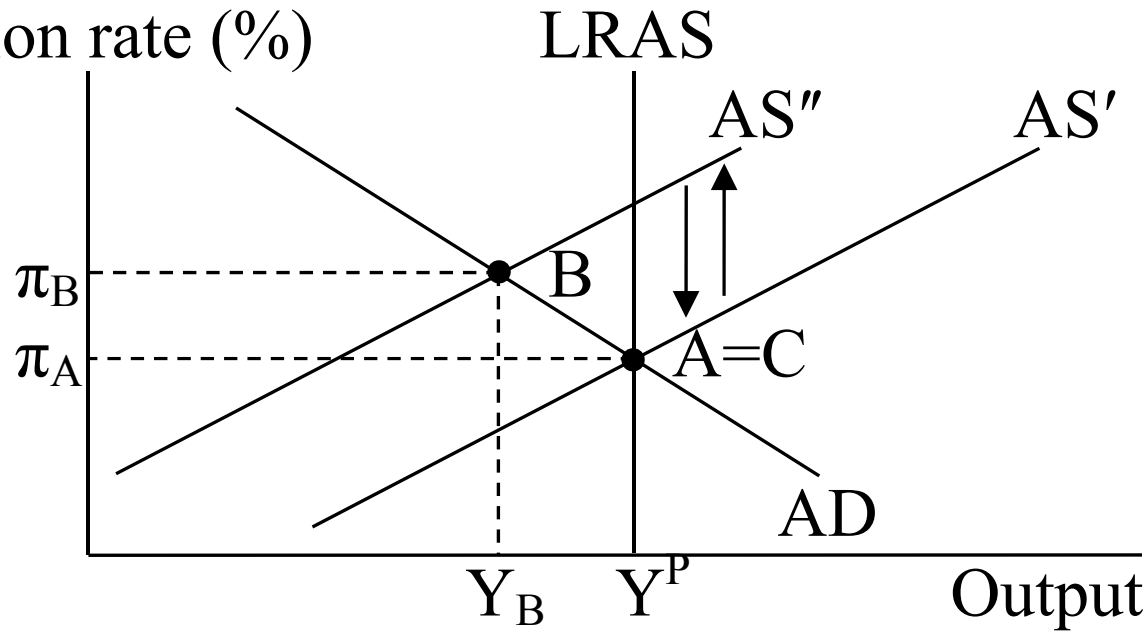
a. A LRAS shock causes $Y^P\downarrow\rightarrow(Y > Y^P)\rightarrow\pi\uparrow$. [LRAS curve shifts left and AS curve shifts up to point B.]

b. The central bank tightens policy, which moves Y to Y^P_C and π to π_A. [AD curve shifts left to point C.]

c. No tradeoff exists between output and inflation.

D. Three Ways Monetary Policy Responds to a Negative Short-Run AS Shock

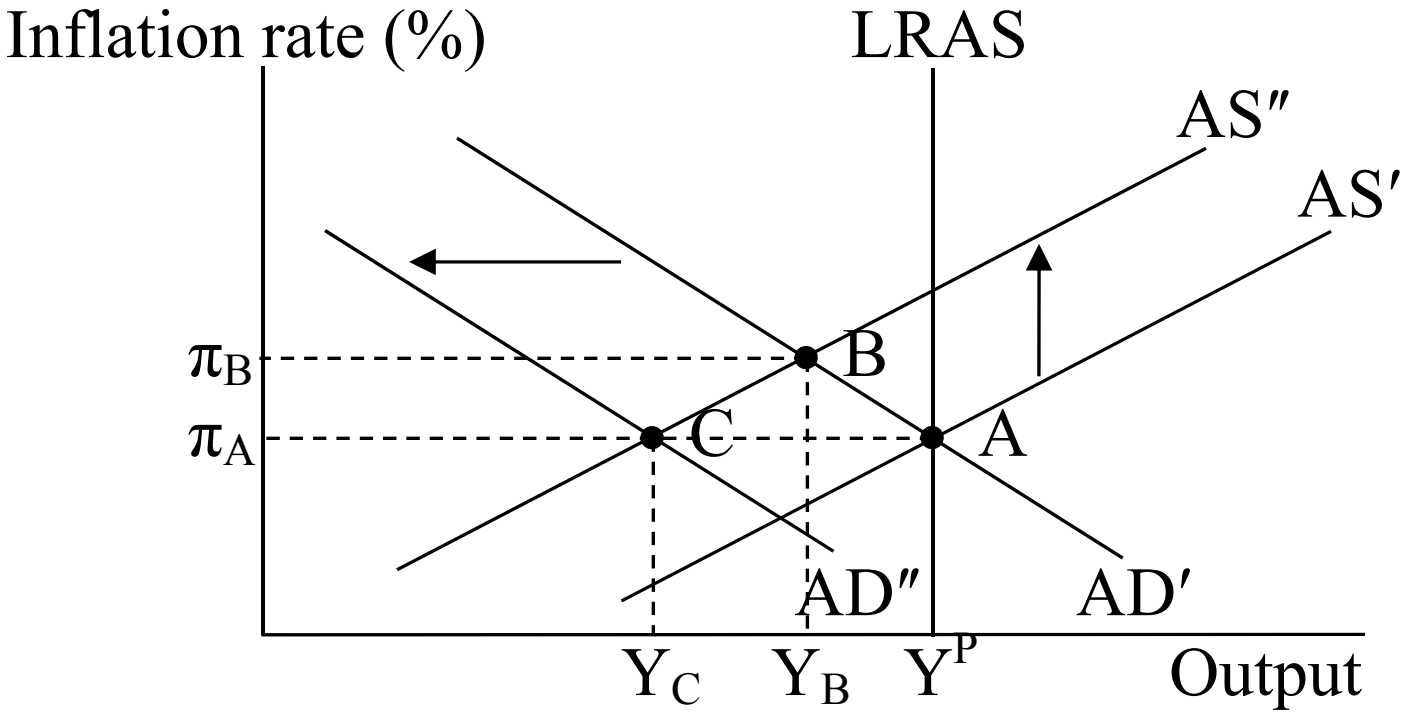
1. No monetary policy response – "Do nothing"



a. In the short run, an AS shock causes $\pi\uparrow$ and $(Y < Y^P)$. [AS curve shifts up to point B.]

b. In the long run, an AS shock has no effect on π and Y. [AS curve shifts down to point C.]

2. Monetary policy is tightened to stabilize inflation.

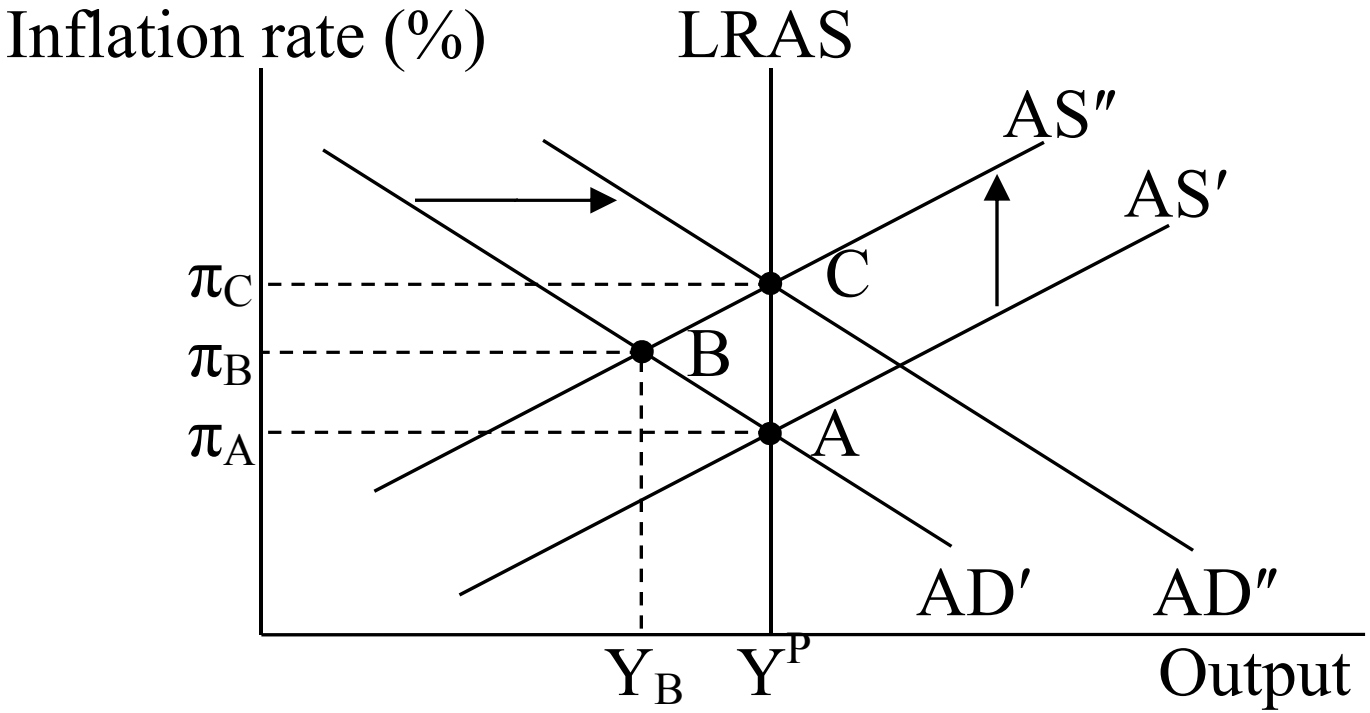


a. An AS shock causes $\pi\uparrow$ and ($Y < Y^P$). [AS curve shifts up to point B.]

b. The central bank tightens policy, which moves Y to Y_C but returns π to π_A. [AD curve shifts left to point C.]

c. Stabilizing inflation leads to a large deviation of output from its potential.

3. Monetary policy is eased to stabilize output.



a. An AS shock causes $\pi\uparrow$ and ($Y < Y^P$). [AS curve shifts up to point B]

b. Central bank eases policy, which raises π to π_C but returns Y to Y^P. [AD curve shifts right to point C.]

c. Stabilizing output leads to a large deviation of the inflation rate from its target.

E. Key Conclusions from Our Analysis

1. Monetary policy can stabilize both output and inflation in response to AD and LRAS shocks.
2. Monetary policy confronts a tradeoff between stabilizing output and stabilizing inflation in response to an AS shock.

Should Monetary Policy Be Used to Stabilize Output?

A. Activists vs Nonactivists

1. Activists believe the government can eliminate unemployment because the self-correcting mechanism of the economy works slowly.
2. Nonactivists believe the self-correcting mechanism of the economy works fast, so government intervention is not necessary.

B. Problems with Activist Policy

1. Policymakers have trouble identifying the level of potential output.
2. Policymakers lack detailed knowledge of current and future economic conditions.
3. There are a variety of lags that prevent the economy from self-correcting immediately.
    a. Recognition lag is the time it takes to identify an economic problem.
    b. Decision-making lag is the time it takes to identify a solution to the problem.
    c. Implementation lag is the time it takes to introduce a policy change.
    d. Effectiveness lag is the time it takes monetary or fiscal policy to have an effect on the economy.

Causes of Inflationary Monetary Policy

A. Activist monetary policy can generate two types of inflation.

   1. Cost-push shocks

      a. These are negative shocks to the short-run AS curve.

      b. These inflation shocks can be caused by things like a rapid increase in oil prices or a push by workers for wage increases that are not justified by productivity gains.

   2. Demand-pull shocks

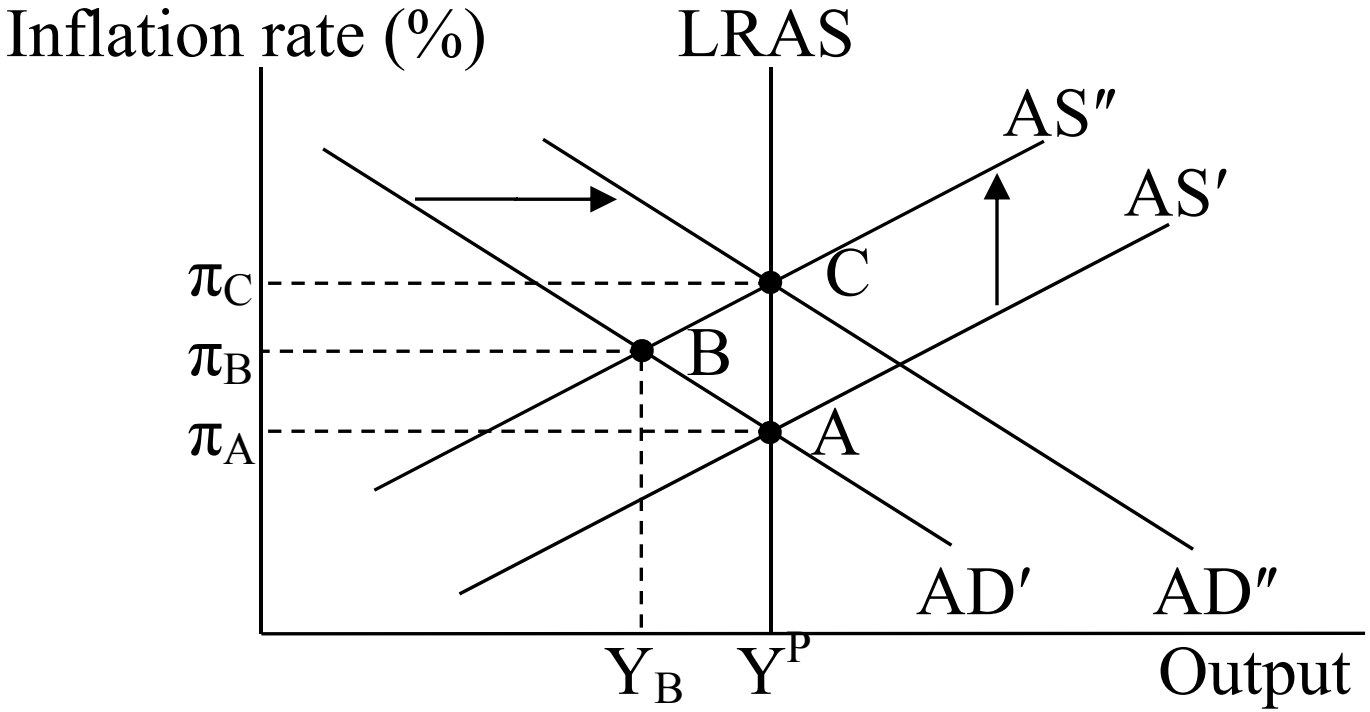
      a. These are positive shocks to the AD curve.

      b. These shocks occur when policymakers try to target a level of output that is above its potential.

B. Cost-Push Inflation

1. Suppose output is initially at its potential. An inflation shock shifts the short-run AS curve up (i.e., $\pi\uparrow$ and $Y < Y^P$). [point B]

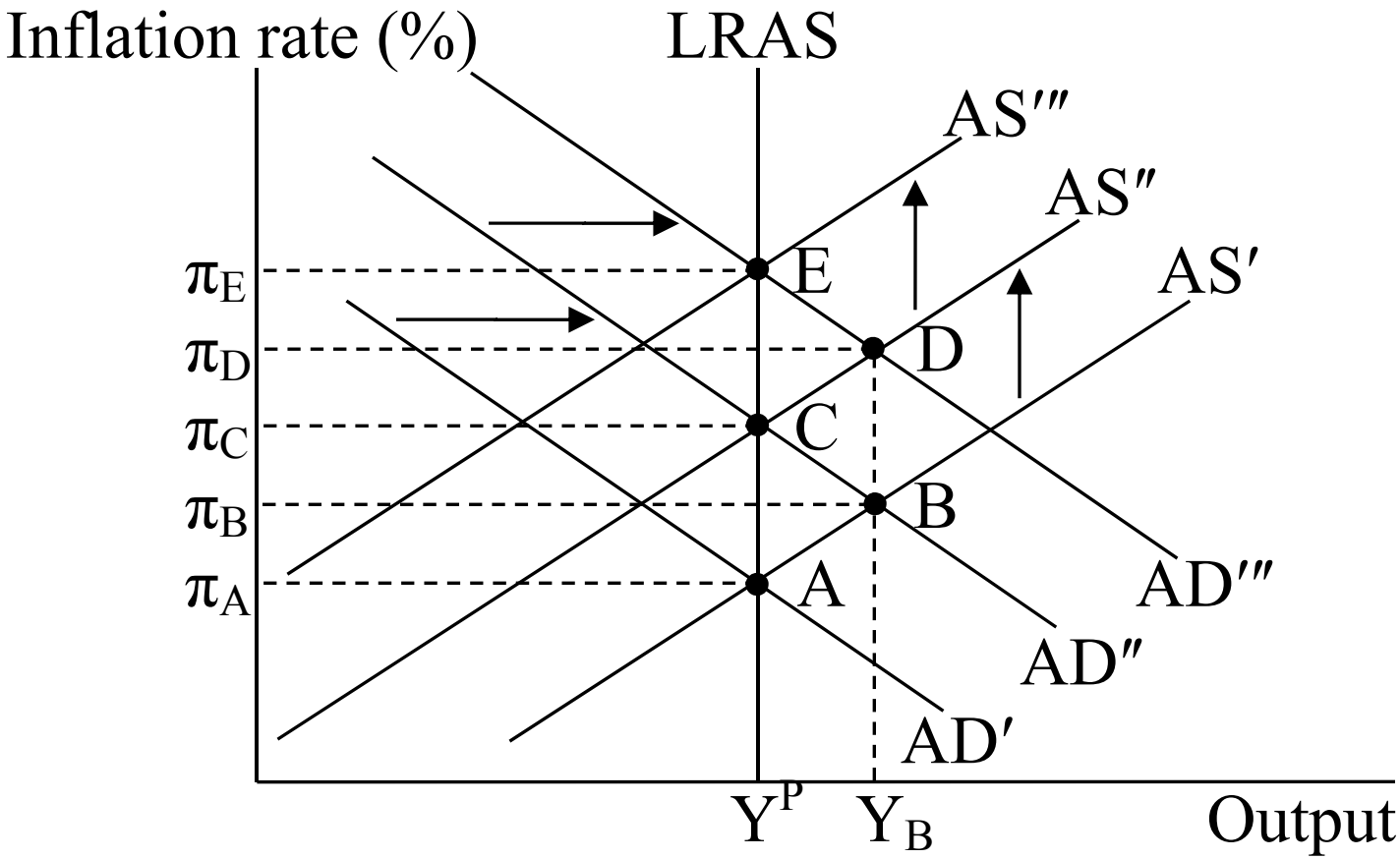
2. The central bank then shifts the AD curve right by easing monetary policy in order to return Y to Y^P. This policy, however, pushes up π even further. [point C]



3. If workers continue to ask for even higher raises or oil prices increase more, the AS curve will continue to shift up. A continued desire to stabilize output would lead to even greater rightward shifts in the AD curve, which would generate even more inflation (i.e., cost-push inflation).

C. Demand-Pull Inflation

1. Suppose output is actually at its potential, but the central bank believes output is below its potential. [point A]
2. The central bank then eases monetary policy causing the AD curve to shift right (i.e., $\pi\uparrow$ and $Y > Y^P$). [point B]
3. Since $Y > Y^P$, the AS curve shifts up over time pushing down output and further pushing up inflation. [point C]
4. At point C, the central bank yet again mistakenly believes output is below its potential. As a result, it continues to ease policy and steps 2 and 3 are repeated. [points D & E]



5. If the central bank continues to target a level of output above its potential, then monetary policy will continue to push the inflation rate higher (i.e., demand-pull inflation).

D. Cost-Push Versus Demand-Pull Inflation

1. Cost-push inflation occurs when output is below its potential.
2. Demand-pull inflation occurs when output is above its potential.
3. It is hard to distinguish in real time between cost-push and demand-pull inflation because policymakers do not have an accurate measure of potential output.

Monetary Policy at the Zero Lower Bound

A. The Monetary Policy (MP) Curve with a Zero Lower Bound

1. The Fisher and policy rule equations

   a. We assume the expected inflation rate (π^e) equals the actual inflation rate (π).

   b. The Fisher equation relates the nominal interest rate (R) to the real interest rate (r) and the inflation rate

$$R = r + \pi. \tag{1}$$

   c. The monetary policy rule when $R > 0$ is

$$R = \bar{r} + \pi + \theta \times (\pi - \pi^*), \tag{2}$$

   where $\bar{r} > 0$ is the autonomous real interest rate, π^* is the target inflation rate, and $\theta > 0$.

2. The MP curve equation when $R > 0$

   a. Substitute (1) into (2) to get

$$r = \bar{r} + \theta \times (\pi - \pi^{*}). \qquad (3)$$

   b. There is a positive relationship between the real interest rate (r) and the inflation rate (π) when $R > 0$.

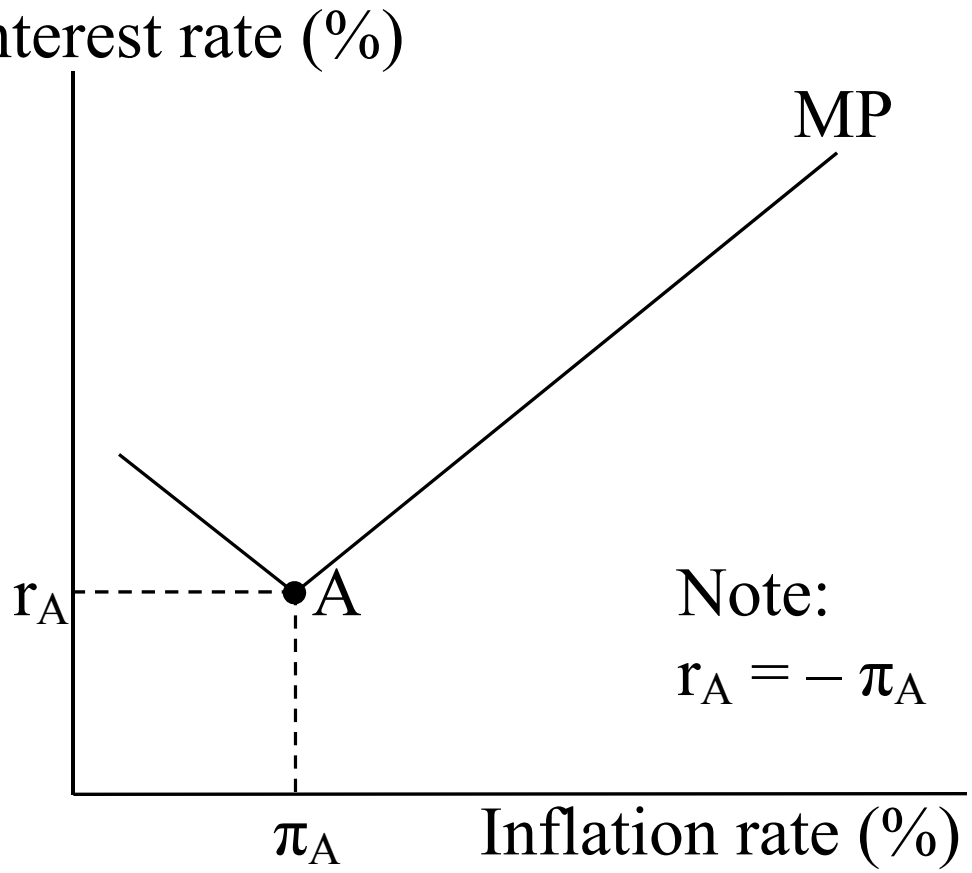
3. The MP curve equation when $R = 0$

   a. When R=0, (1) becomes

$$r = -\pi. \qquad (4)$$

   b. There is a negative relationship between the real interest rate (r) and the inflation rate (π) when $R = 0$.

4. The graph of the monetary policy curve



a. When $\pi > \pi_A$, the nominal interest rate is above the zero lower bound ($R > 0$).

b. When $\pi \leq \pi_A$, the nominal interest rate is at the zero lower bound ($R = 0$).

B. The Aggregate Demand (AD) Curve with a Zero Lower Bound

1. The IS curve equation is

$$Y = \frac{\bar{C} + \bar{I} + \bar{G} + \overline{NX} - d \times \bar{f} - MPC \times \bar{T}}{1 - MPC} - \frac{d + x}{1 - MPC} \times r. \qquad (5)$$

2. The AD curve equation when $R > 0$

   a. Substitute (3) into (5) to get

$$Y = \frac{\bar{C} + \bar{I} + \bar{G} + \overline{NX} - d \times \bar{f} - MPC \times \bar{T} - (d+x) \times (\bar{r} - \theta \times \pi^*)}{1 - MPC} - \frac{(d + x) \times \theta}{1 - MPC} \times \pi.$$

   b. There is a negative relationship between output (Y) and the inflation rate (π) when $R > 0$.

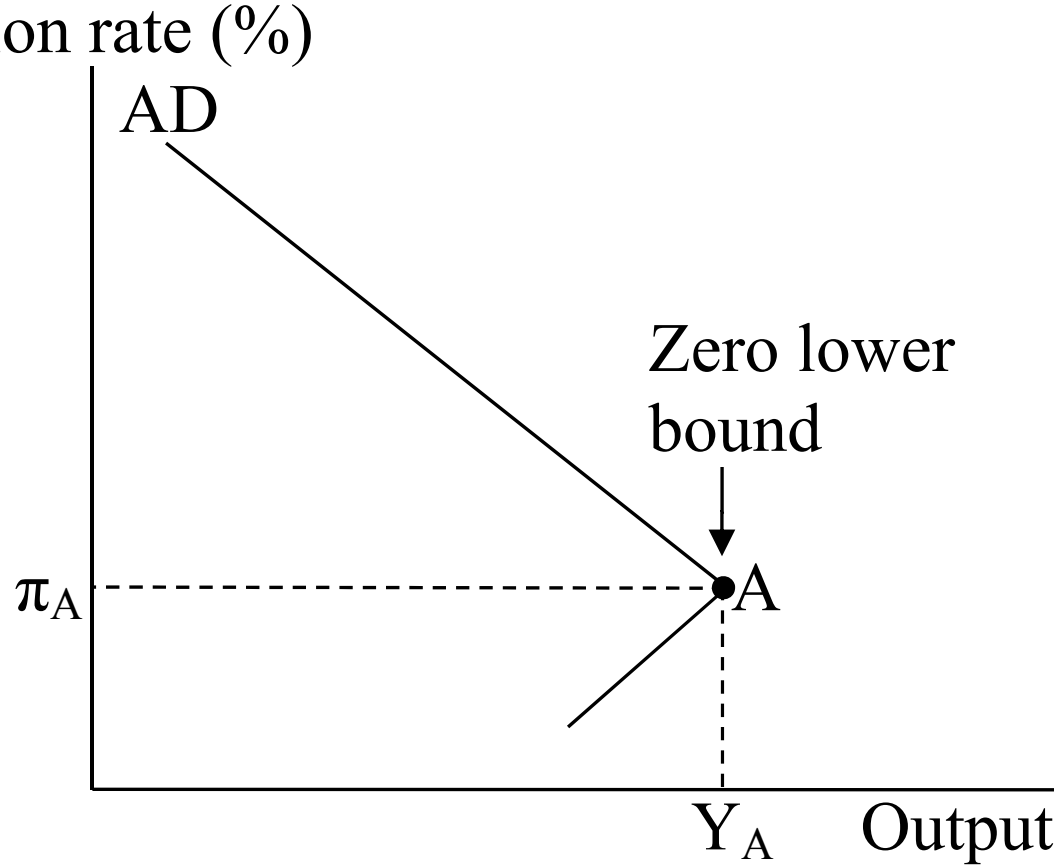
3. The AD curve equation when R = 0

   a. Substitute (4) into (5) to get

$$Y = \frac{\bar{C} + \bar{I} + \bar{G} + \overline{NX} - d \times \bar{f} - MPC \times \bar{T}}{1 - MPC} + \frac{d + x}{1 - MPC} \times \pi. \qquad (6)$$

   b. There is a positive relationship between output (Y) and the inflation rate (π) when R = 0.

4. The graph of the aggregate demand curve

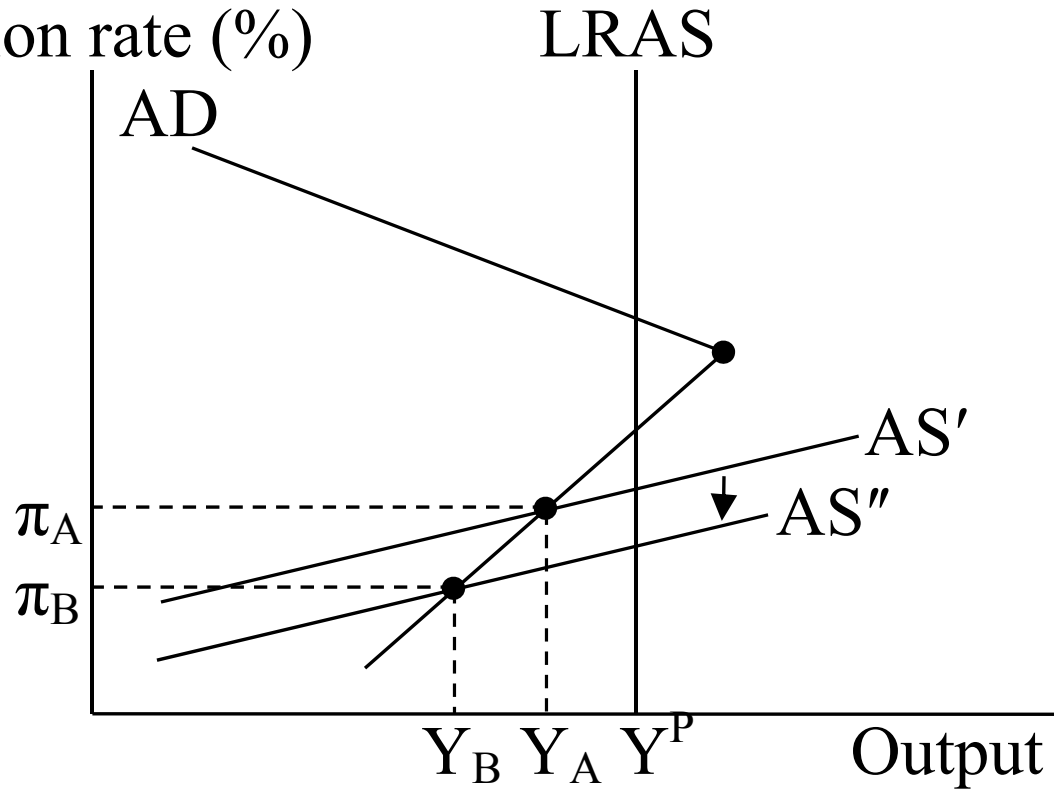


   a. When $\pi > \pi_A$, the nominal interest rate is above the zero lower bound ($R > 0$).

   b. When $\pi \leq \pi_A$, the nominal interest rate is at the zero lower bound ($R = 0$).

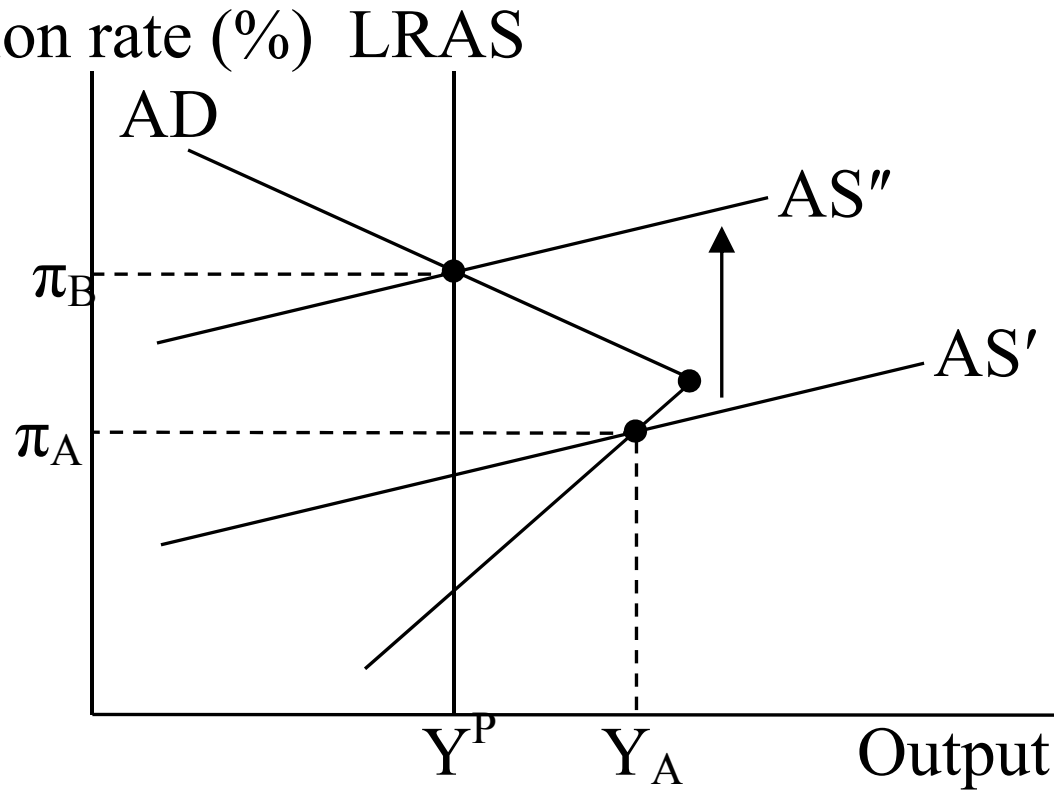
C. Output Might Not Return to Potential at the Zero Lower Bound

1. Suppose $Y < Y^P$ and $R = 0$



a. If $Y < Y^P$ at the zero lower bound, then Y will continue to decline over time. (AS curve shifts down.) Thus, the economy does not self-correct.

2. Suppose $Y > Y^P$ and $R = 0$



   a. If $Y > Y^P$ at the zero lower bound, then Y will decline to Y^P over time. (AS curve shifts up.) Thus, the economy self-corrects.

3. In most cases when $R = 0$, $Y < Y^P$, so the economy will not be able to self-correct.

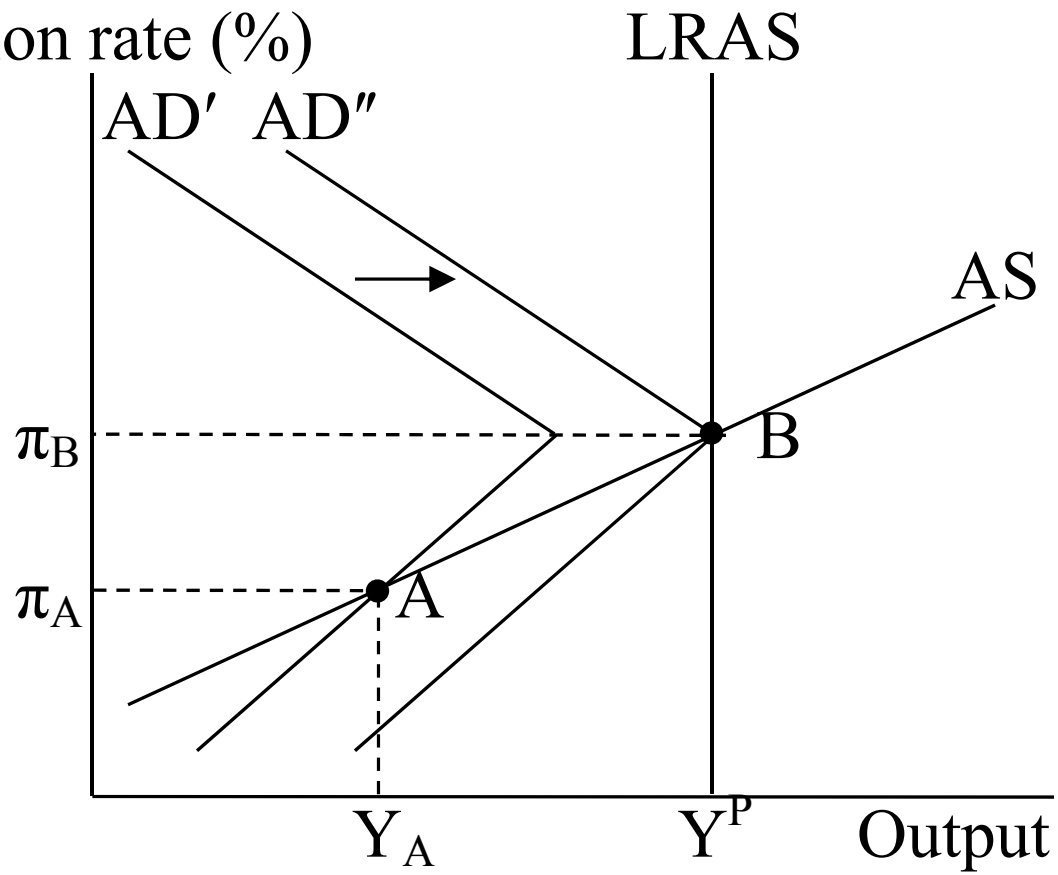
The Impact of Unconventional Monetary Policy at the Zero Lower Bound

A. Unconventional monetary policy is designed to stimulate the economy by reducing asymmetric information problems ($\bar{f}\downarrow$) when the nominal interest rate is at the zero lower bound.

B. There are three types of unconventional monetary policy.

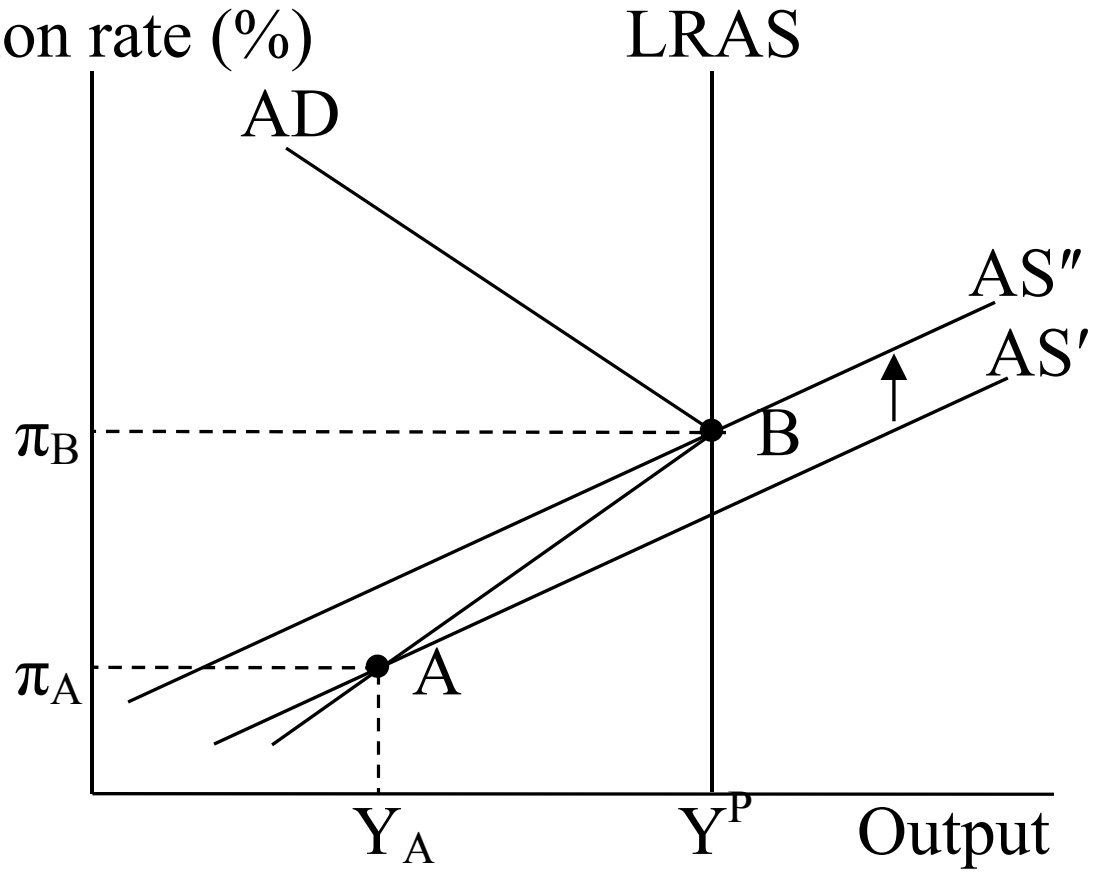
   1. Programs to provide liquidity to financial markets
   2. Large-scale asset purchases (quantitative easing)
   3. Forward guidance (managing expectations)

C. When $Y < Y^P$ and $R = 0$, unconventional monetary policy lowers $\bar{f}$ and shifts the AD curve right.



1. This rightward shift in the AD curve from unconventional monetary policy causes both output and inflation to rise. [point B]

D. When $Y < Y^P$ and $R = 0$, forward guidance can, in some cases, cause inflation expectations to rise, which is represented by an upward shift in the AS curve.



1. This upward shift in the AS curve from forward guidance causes both output and inflation to rise. [point B]