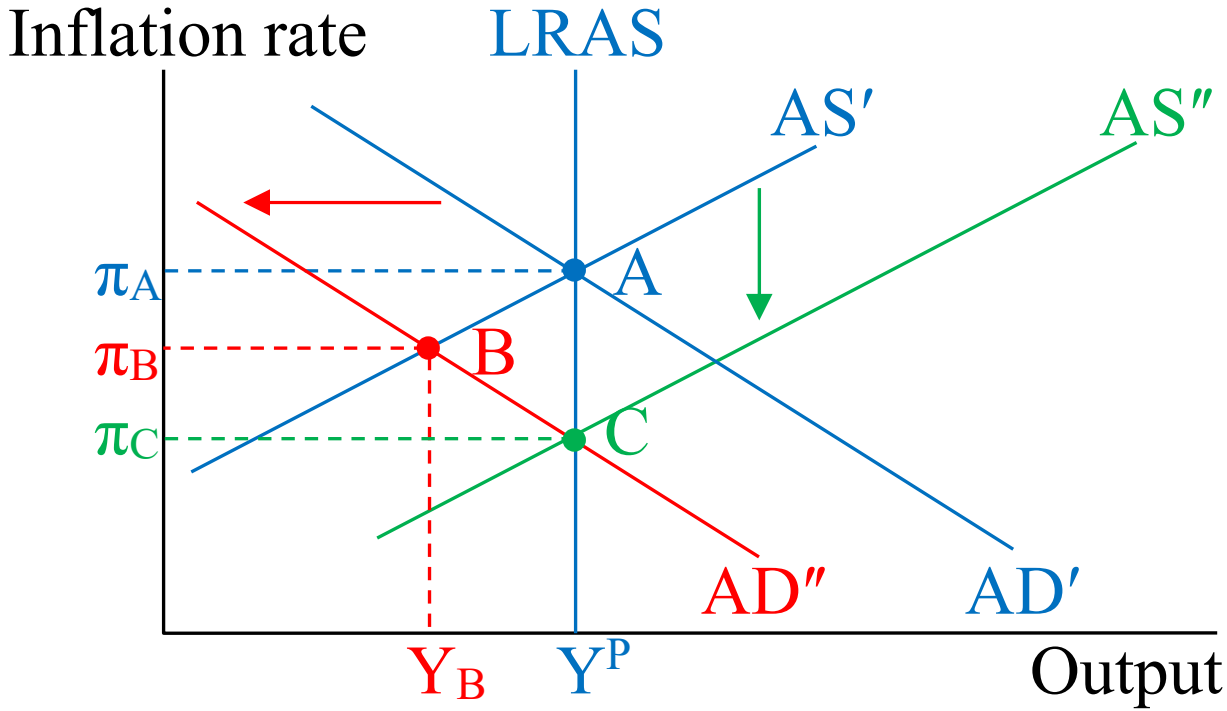
Prep Questions for the Final: Answers

1. *Describe the two ways monetary policy can respond to a negative aggregate demand shock. What are the short-run and long-run effects of each policy? Use an AD/AS graph for each type of monetary policy to support your answer. What do these graphs say about the tradeoff between output and inflation?*

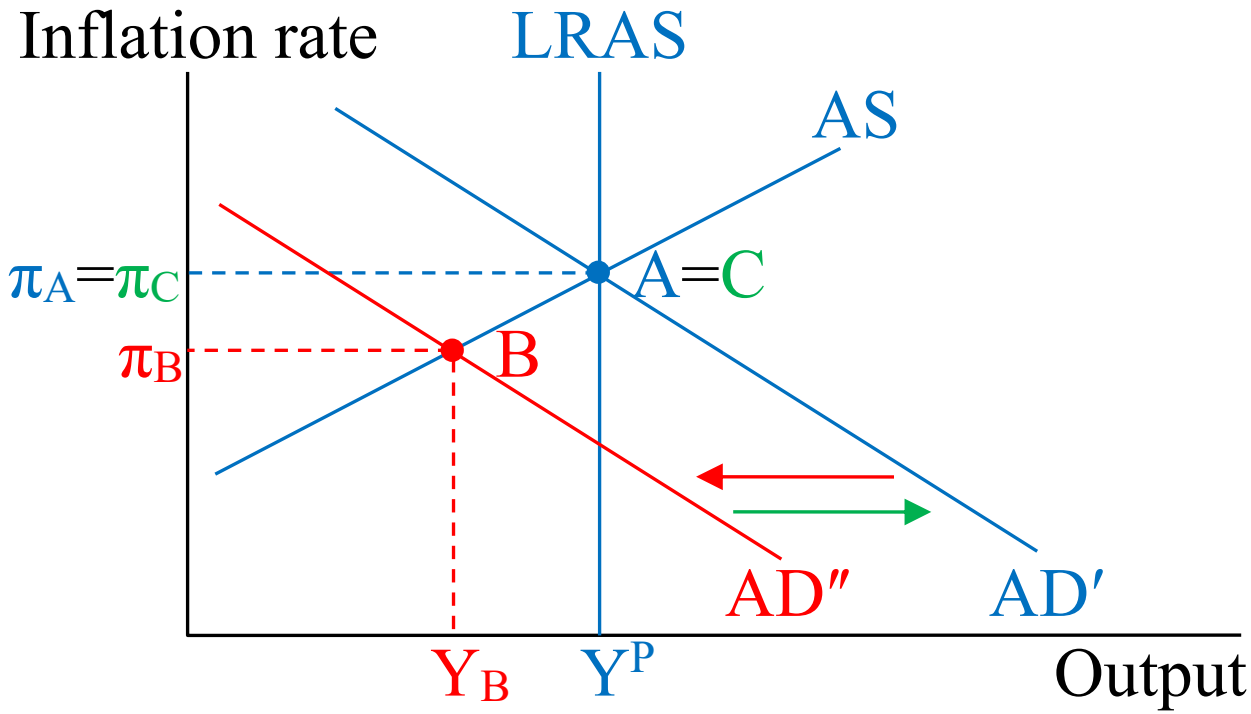
   Approach 1: No monetary policy response – "Do nothing." In the short run, a negative AD shock shifts the AD curve to the left and causes inflation to decline and output to fall below its potential. The economy moves to point B. In the long run, output being below its potential puts downward pressure on inflation which leads to output returning to its

potential. This change is represented by a rightward shift in the AS curve as the economy moves to point C.



Approach 2: Monetary policy is eased to stabilize output and inflation. In the short run, a negative AD shock shifts the AD curve to the left and causes inflation to decline and

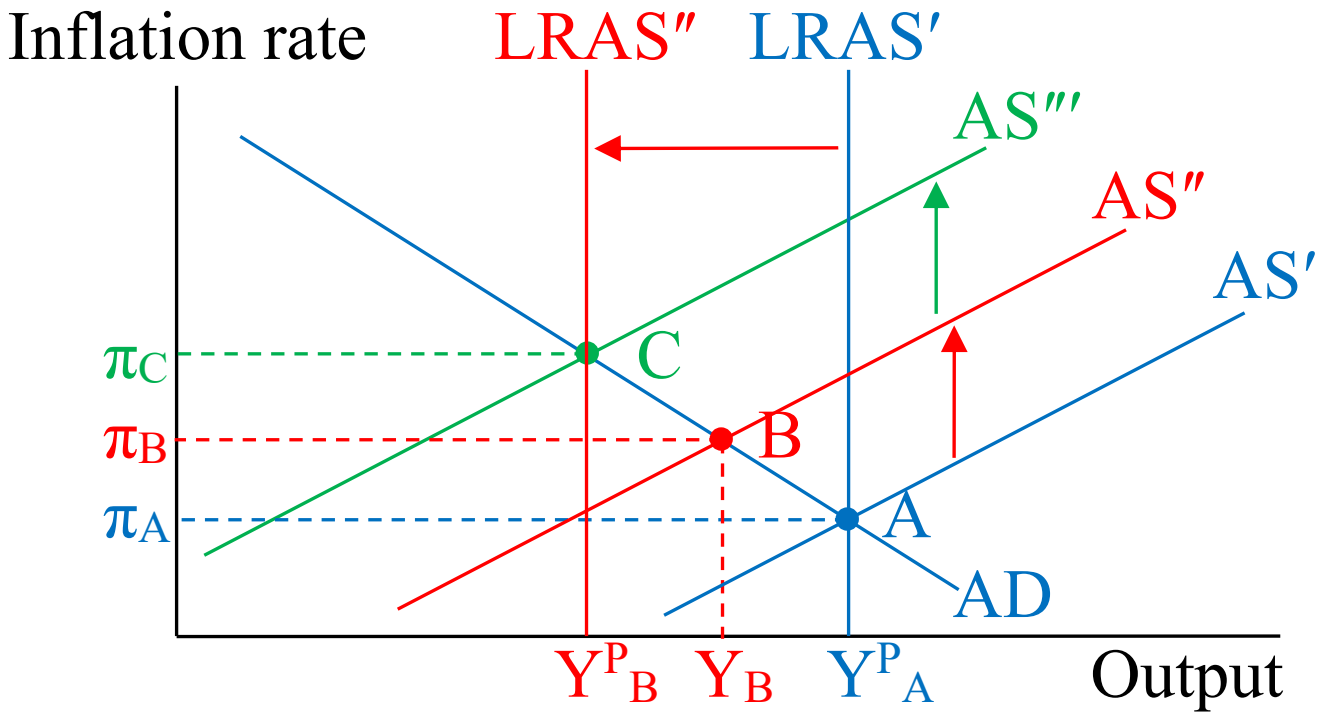
output to fall below its potential. The economy moves to point B. The central bank then responds by easing monetary policy (reducing nominal and real interest rates), which returns output to its potential and inflation to its original level. This change is represented by a rightward shift in the AD curve as the economy returns to point A (or point C).



2. *Describe the two ways monetary policy can respond to a negative, long-run aggregate supply shock. What are the short-run and long-run effects of each policy? Use an AD/AS graph for each type of monetary policy to support your answer. What do these graphs say about the tradeoff between output and inflation?*

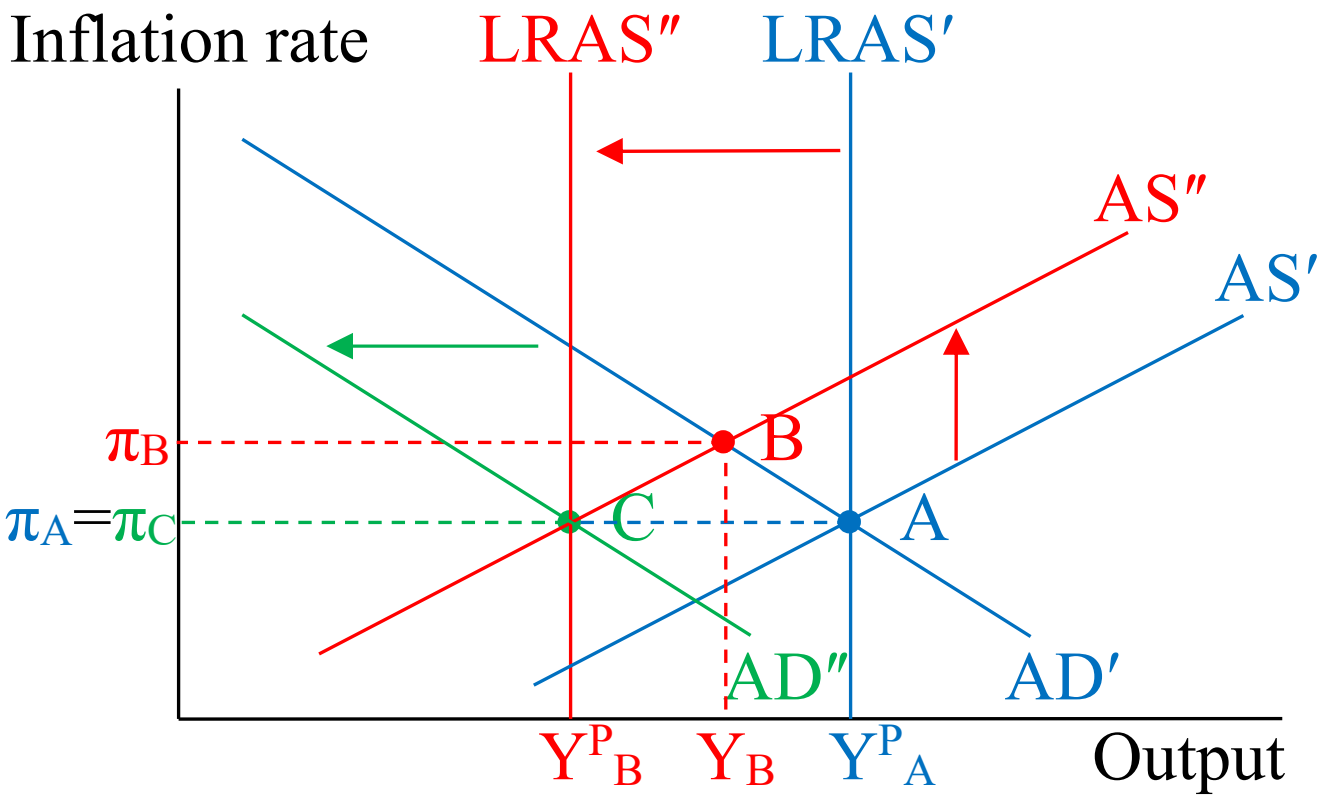
   Approach 1: No monetary policy response – "Do nothing." In the short run, a negative potential output shock shifts the LRAS and AS curves to the left and causes inflation to rise and output to fall toward its new lower level of potential output. The economy moves to point B. In the long run, inflation continues to rise as output continues to decline toward its new lower level of potential output while inflation continues to rise. That change is represented by a

further leftward shift in the AS curve as the economy moves to point C.



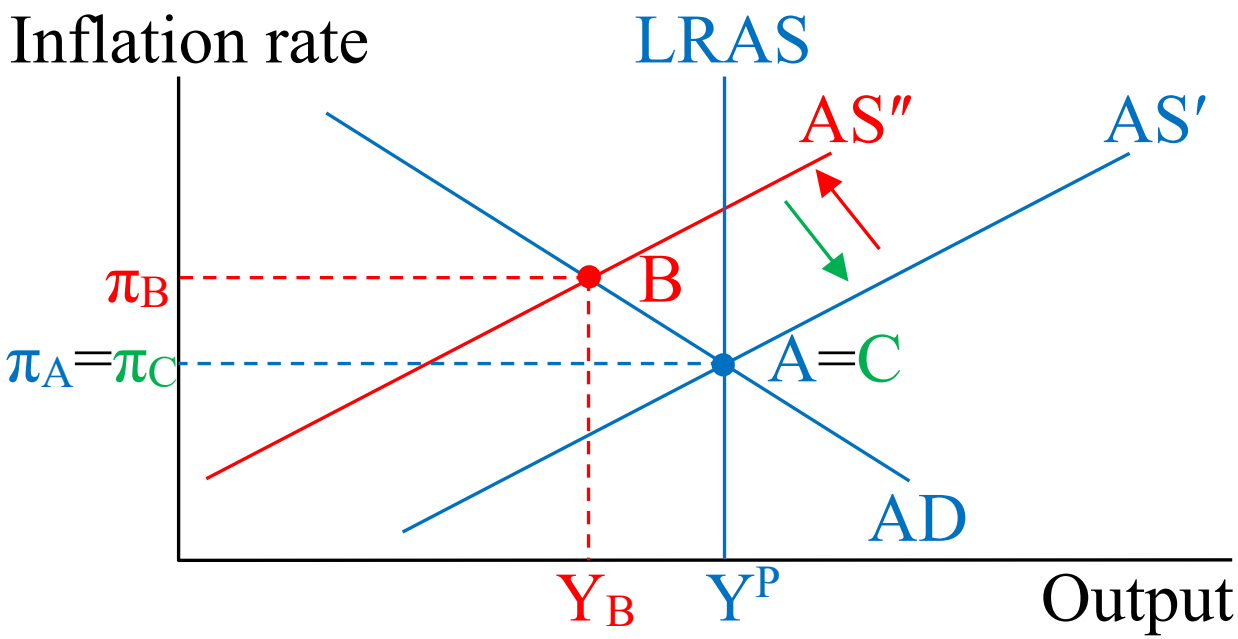
Approach 2: Monetary policy is tightened to stabilize inflation. In the short run, a negative potential output shock shifts the LRAS and AS curves to the left and causes

inflation to rise and output to fall toward its new lower level of potential output. The economy moves to point B. The central bank then responds to that negative potential output shock by tightening monetary policy (raising the nominal and real interest rates), which lowers output to its new level of potential output while inflation falls to its original level. This change is represented by a leftward shift in the AD curve as the economy moves to point C.


Inflation rate
LRAS″
LRAS′
AS″
AS′
πB
πA=πC
B
C
A
AD″
AD′
YPB
YB
YPA
Output

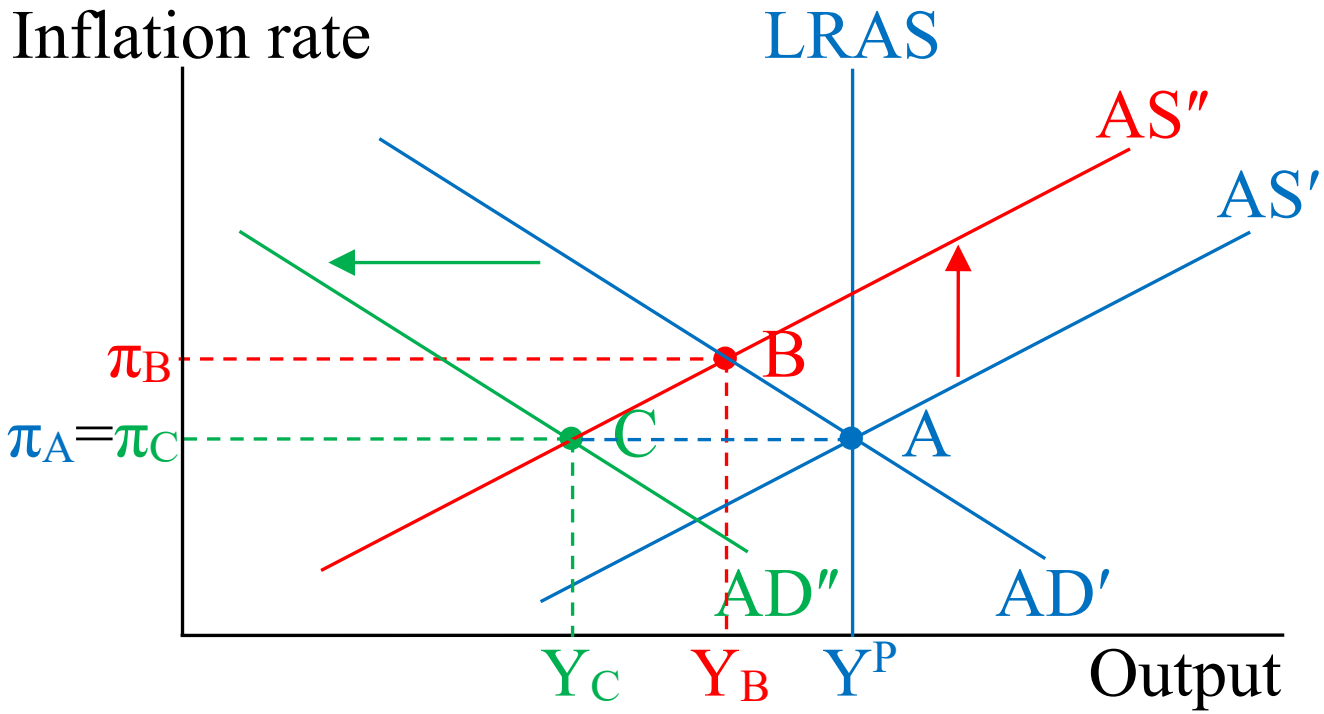
3. *Describe the three ways monetary policy can respond to a negative, short-run aggregate supply shock. What are the short-run and long-run effects of each policy? Use an AD/AS graph for each type of monetary policy to support your answer. What do these graphs say about the tradeoff between output and inflation?*

   Approach 1: No monetary policy response – "Do nothing." In the short run, a positive inflation shock pushes up actual inflation which leads to a reduction in output. That shock is represented by a leftward shift AS such that the economy moves to point B. In the long run, output being below its potential puts downward pressure on inflation which leads to output returning to its potential and inflation to return to its original level. This change is represented by a rightward shift in the AS curve as the economy moves to point C.

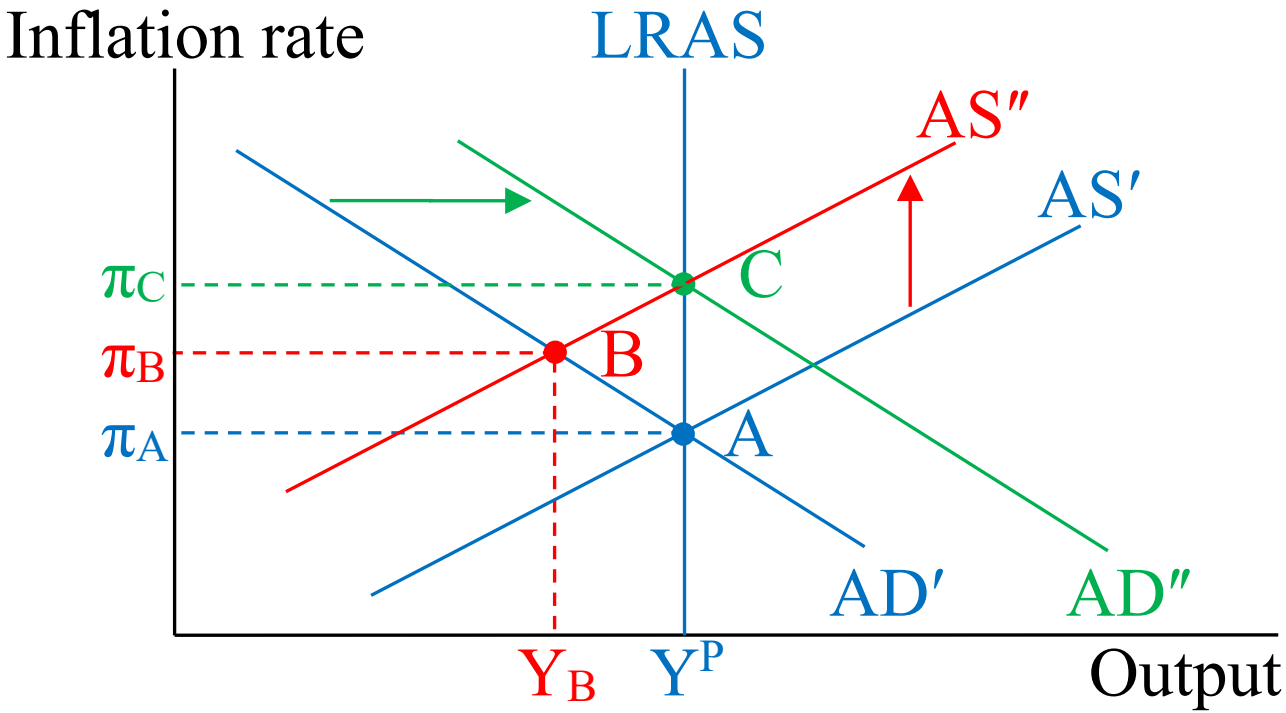


Approach 2: Monetary policy is tightened to stabilize inflation. a positive inflation shock pushes up actual inflation which leads to a reduction in output. That shock is represented by a leftward shift AS such that the economy moves to point B. The central bank then responds to that negative potential output shock by tightening monetary

policy (raising the nominal and real interest rates), which lowers output to its new level of potential output while inflation falls to its original level. This change is represented by a leftward shift in the AD curve as the economy moves to point C. Stabilizing inflation leads to a large deviation of output from its potential.



Approach 3: Monetary policy is eased to stabilize output. a positive inflation shock pushes up actual inflation which leads to a reduction in output. That shock is represented by a leftward shift AS such that the economy moves to point B. The central bank then responds to that negative potential output shock by easing monetary policy (lowering the nominal and real interest rates), which raises output to its potential while inflation continues to rise. This change is represented by a rightward shift in the AD curve as the economy moves to point C. Stabilizing output leads to a large deviation of the inflation rate from its target.


Inflation rate
LRAS
AS″
AS′
πC
πB
πA
C
B
A
AD′
AD″
YB
YP
Output

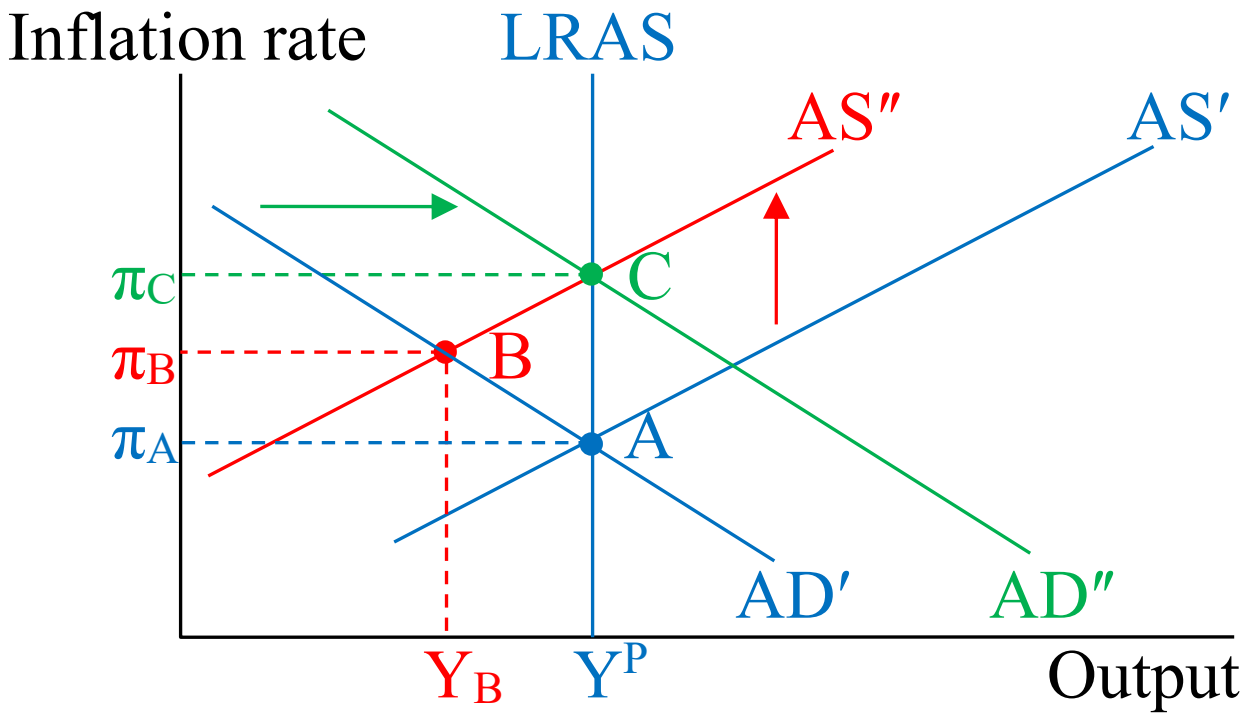
4. *Name and briefly describe the four lags that prevent the economy from immediately self-correcting.*

   There are a variety of lags that prevent the economy from self-correcting immediately. Recognition lag is the time it takes to identify an economic problem. Decision-making lag is the time it takes to identify a solution to the problem. Implementation lag is the time it takes to introduce a policy change. Effectiveness lag is the time it takes monetary or fiscal policy to have an effect on the economy.

5. *What are cost-push shocks, and what are some potential causes? How can activist's monetary policy cause inflation when responding to a cost-push shock? Use an AD/AS graph to support your answer.*

   Cost-push shocks are negative shocks to the short-run AS curve. 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. Suppose cost-push shock shifts the short-run AS curve up causing output to fall and inflation to rise. That is, the economy moves to point B. The central bank then shifts the AD curve right and the economy moves to point C by easing monetary policy in order to return output to its potential. This policy, however, pushes up inflation further even further. If workers continue to ask for even higher

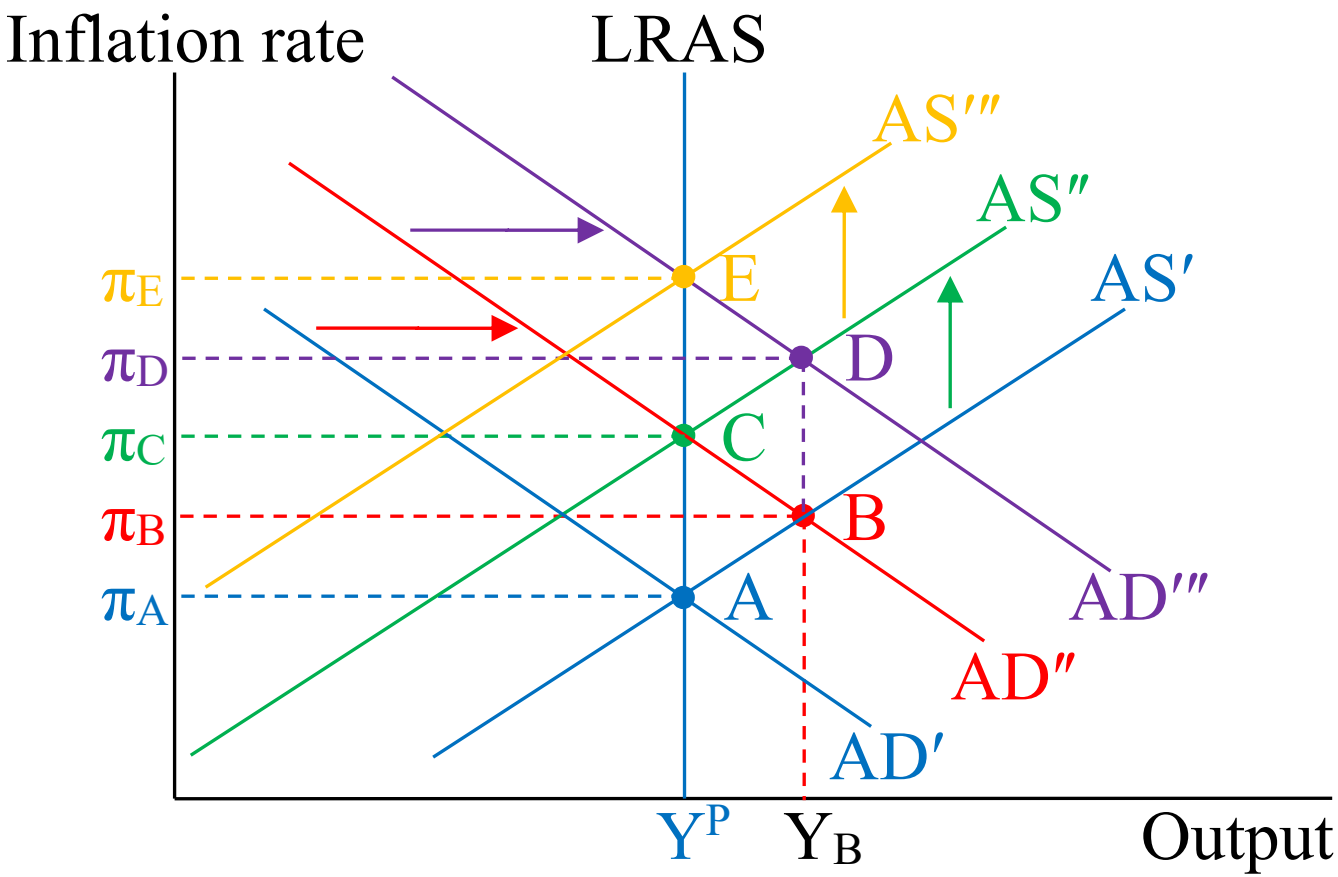
raises or oil prices increase more, the AS curve will continue to shift up. A continued desire to stabilize output would lead to even greater rightward shifts in the AD curve, which would generate even more inflation (i.e., cost-push inflation).



6. *What are demand-pull shocks, and what is a potential cause? How can activist's monetary policy cause inflation with a demand-pull shock? Use an AD/AS graph to support your answer.*

Demand-pull shocks are positive shocks to the AD curve. These shocks occur when policymakers try to target a level of output that is above its potential. Suppose output is at its potential, but the central bank believes output is below its potential. The central bank then eases monetary policy causing output and inflation to rise. That change causes the AD curve to shift right and the economy to move to point B. Since output is above its potential, the AS curve shifts to the left over time to point C which pushes down output but leads to a further increase in inflation. At point C, the central bank yet again mistakenly believes output is below

its potential. As a result, it continues to ease policy by shifting the AD curve right while the resulting positive output gap continues to push inflation higher and the AS curve to the left (see points D & E). 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).


Inflation rate
LRAS
AS‴
AS″
AS′
πE
πD
πC
πB
πA
E
D
C
B
A
AD‴
AD″
AD′
YP
YB
Output

7. *Suppose the IS curve, the monetary policy rule, and the Fisher equation are as follows:*

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

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

$$R = r + \pi.$$

a. *Derive the MP curve equation when R > 0.*

$$R = \bar{r} + \pi + \theta \times (\pi - \pi^*) \;\&\; R = r + \pi$$

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

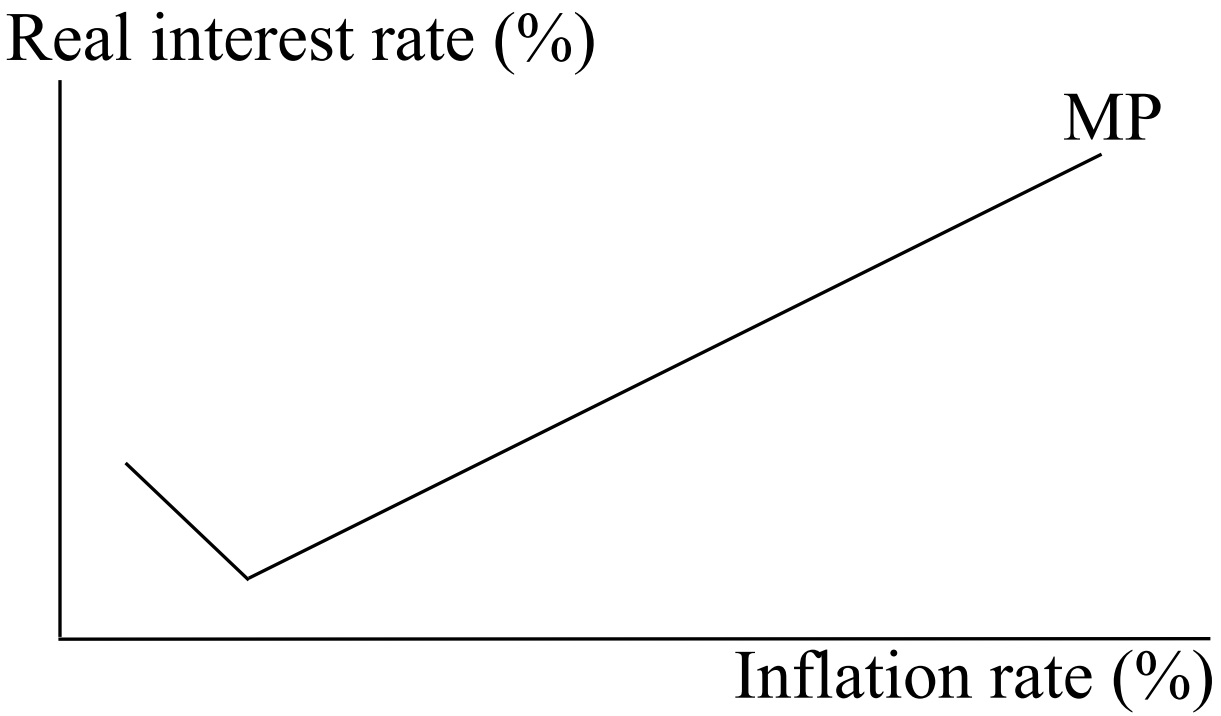
$$r = \bar{r} + \theta \times (\pi - \pi^*)$$

b. *Derive the MP curve equation when R = 0.*

$$R = 0 \;\&\; R = r + \pi$$

$$0 = r + \pi \rightarrow r = -\pi$$

c. *Graph the MP curve (include both the times when $R > 0$ and $R = 0$).*



d. *Derive the AD curve equation when R > 0.*

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

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

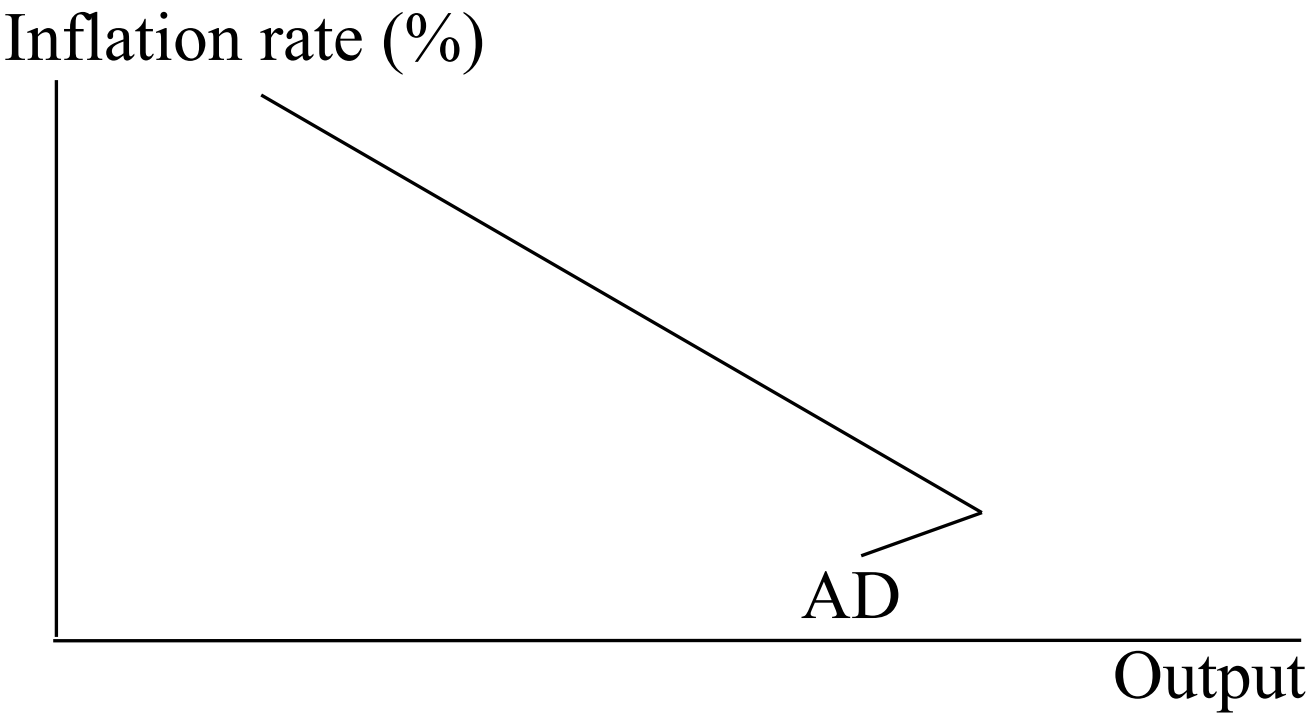
$$Y = \frac{\bar{C} + \bar{I} + \bar{G} + \overline{NX} - d \times \bar{f} - MPC \times \bar{T}}{1 - MPC} - \frac{(d + x) \times (\bar{r} - \theta \times \pi^*)}{1 - MPC} - \frac{(d + x) \times \theta \times \pi}{1 - MPC}$$

e. *Derive the AD curve equation when R = 0.*

$$Y = \frac{\bar{C} + \bar{I} + \bar{G} + \overline{NX} - d \times \bar{f} - MPC \times \bar{T}}{1 - MPC} - \frac{d + x}{1 - MPC} \times r \;\&\; r = -\pi$$

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

f. *Graph the AD curve (include both the times when $R > 0$ and $R = 0$).*

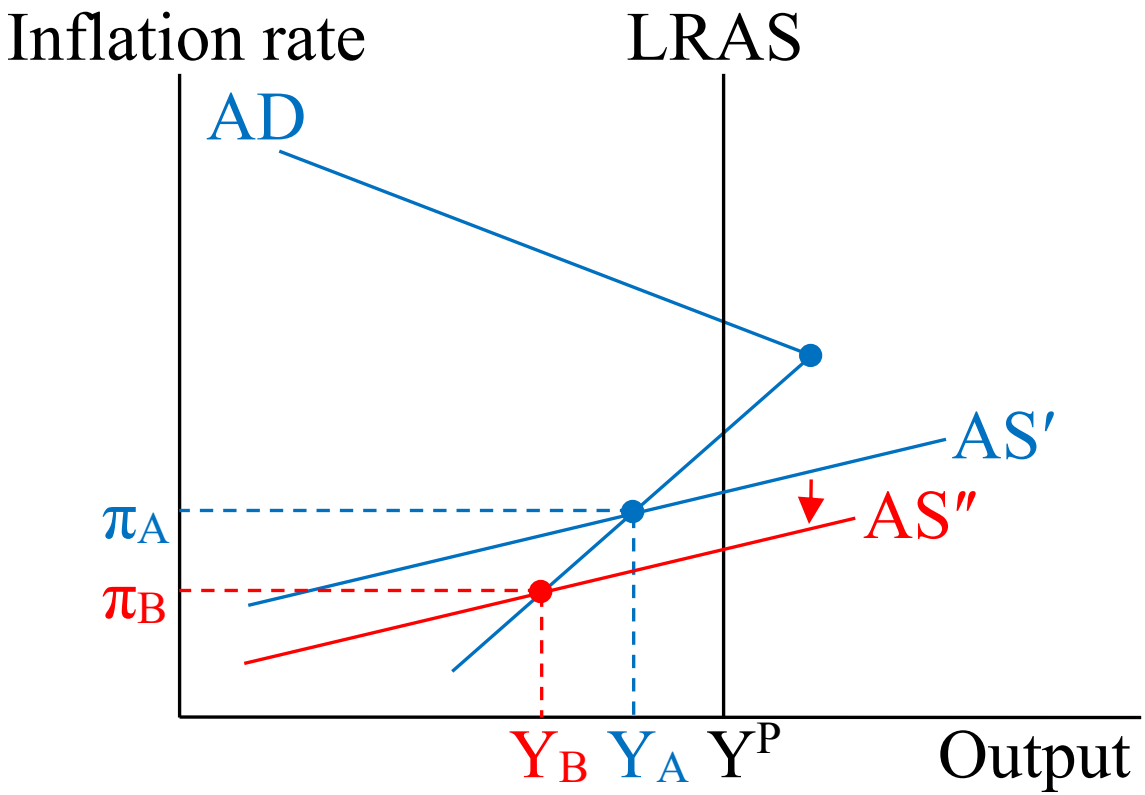


8. *Consider an economy where the AD curve intersects the LRAS curve in two places (once where $R > 0$ and once where $R = 0$) and the AD curve at $R=0$ is steeper than the AS supply curve. In each of the situations below, use an AD/AS graph to show whether the economy returns to Y^P in the long run.*

   a. *Suppose $Y < Y^P$ and $R = 0$*

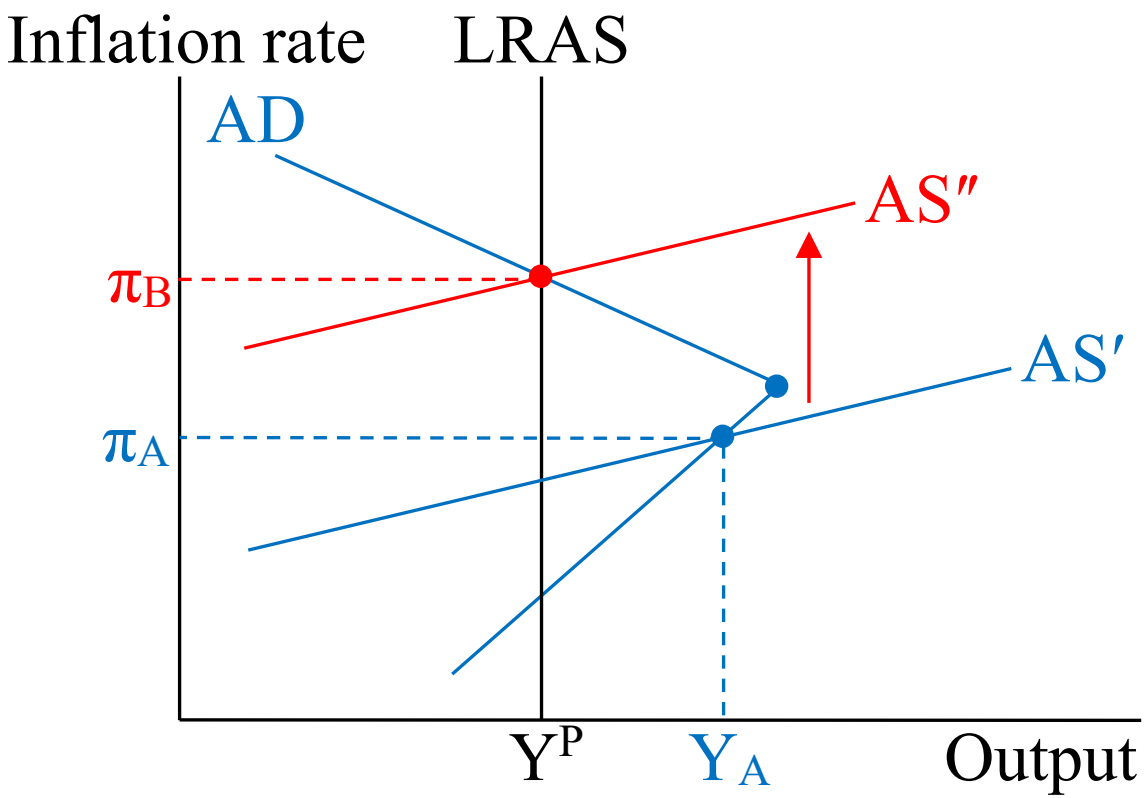
      If output is below its potential and the nominal interest rate is zero, then the negative output gap will continue to push down inflation. Since the nominal interest rate is zero, the fall in inflation will cause the real interest rate to rise. That higher real interest rate will depress investment and net exports which will push down output further. Thus, the AS curve shifts down and output

moves further away from its potential which means the economy is not self-correcting.



b. *Suppose* $Y > Y^P$ *and* $R = 0$

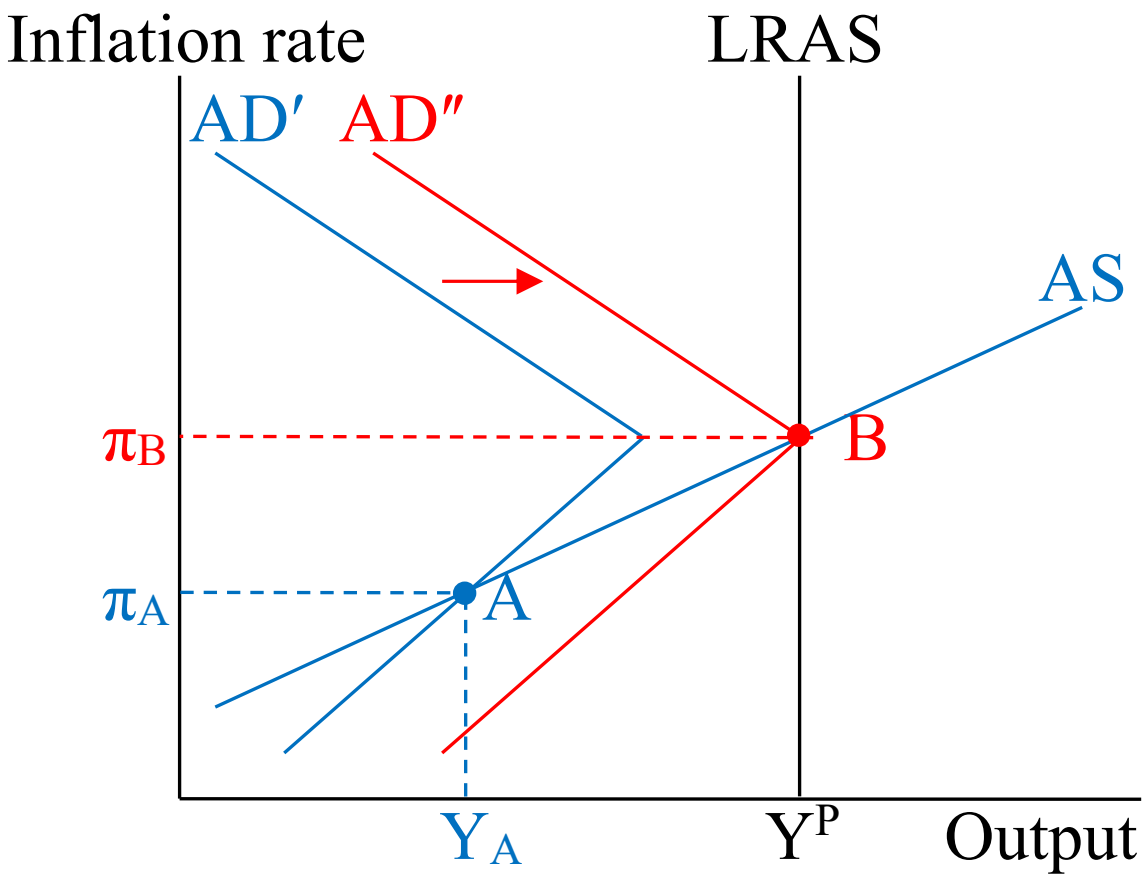
If output is above its potential and the nominal interest rate is zero, then the positive output gap will push up inflation. Since the nominal interest rate is zero, the rise in inflation will cause the real interest rate to fall. That lower real interest rate will stimulate investment and net exports which will push up output further. Thus, the AS curve shifts up and output initially moves up until the nominal interest rate starts to rise. Once the nominal interest rate starts to rise, the real interest rate begins to increase which depresses investment and net exports which pushes down output until it reaches its potential. Thus, the economy self-corrects when output is above its potential and the nominal interest rate is zero.


Inflation rate
LRAS
AD
AS″
π_B
AS′
π_A
Y^P
Y_A
Output

9. *Consider an economy where the AD curve intersects the LRAS curve in two places (once where $R > 0$ and once where $R = 0$) and the AD curve at $R=0$ is steeper than the AS supply curve. Initially assume $Y < Y^P$ and $R=0$. In each of the situations below, use an AD/AS graph to show how unconventional monetary policy can move output back to its potential.*

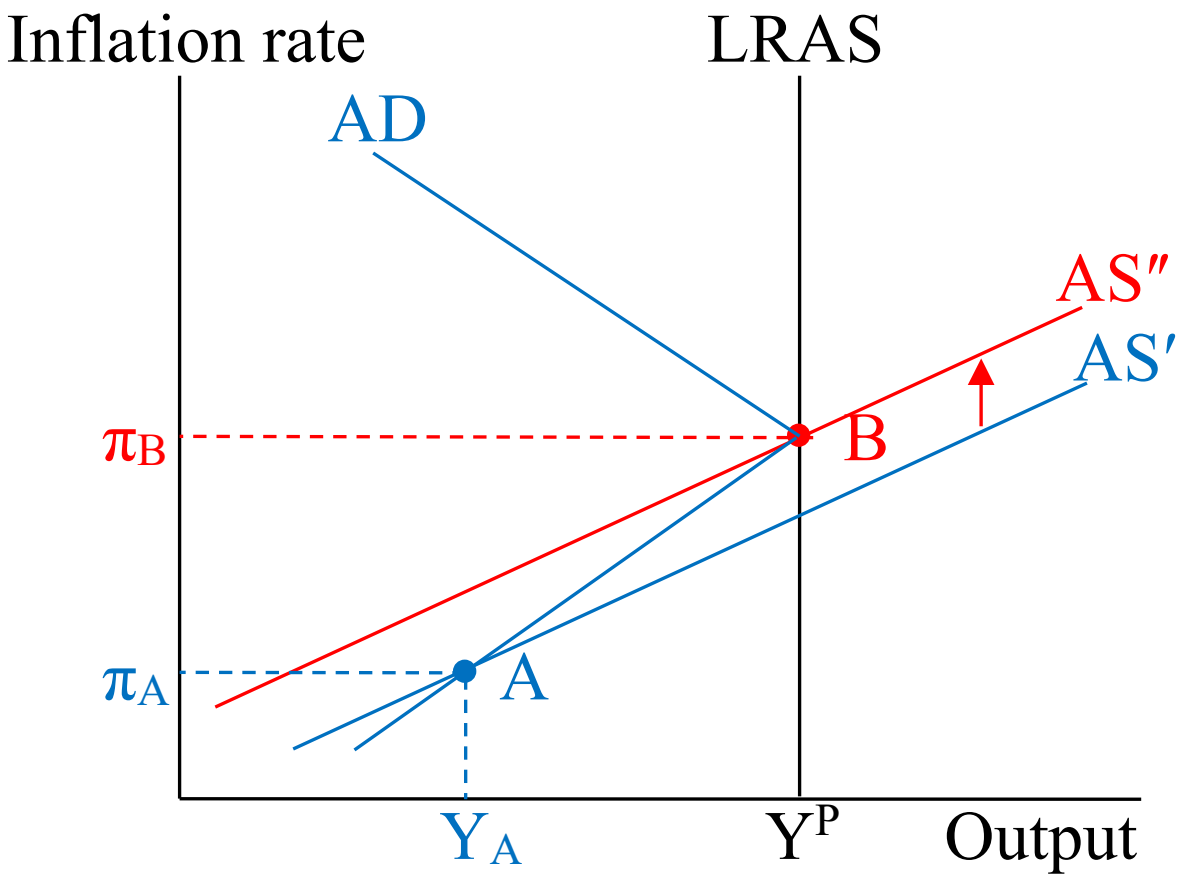
   a. *Suppose the central bank provides liquidity to financial markets to reduce financial frictions ($\bar{f}\downarrow$).*

      When output is below its potential and the nominal interest rate is zero, providing liquidity to financial markets lowers financial frictions will cause investment rise. That increase in investment will raise output and inflation and cause the AD curve to shift right.


Inflation rate
LRAS
AD′
AD″
AS
πB
B
πA
A
YA
YP
Output

b. *Suppose the central bank provides forward guidance to raise inflation expectations.*

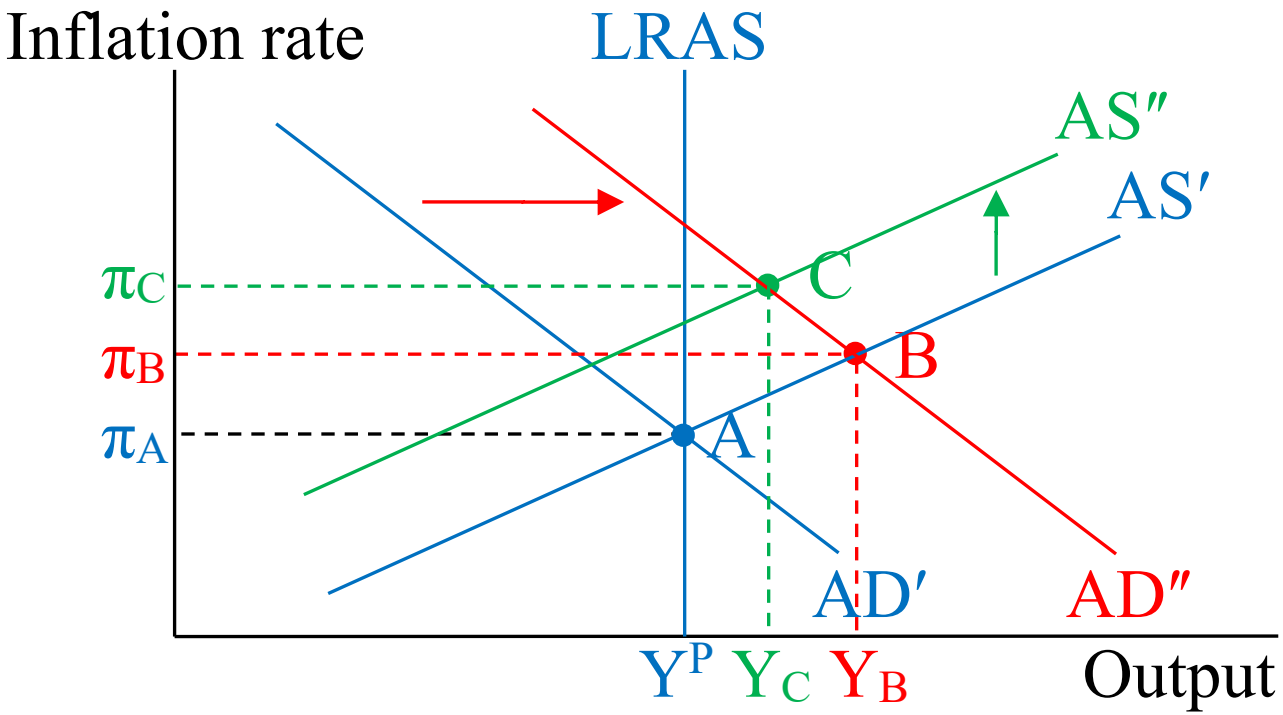
When output is below its potential and the nominal interest rate is zero, forward guidance can cause inflation expectations to rise, which will lead to a decline in the real interest rate. That lower real interest rate will stimulate investment and net exports which will push up output. The increase in inflation expectations is represented by an upward shift in the AS curve.


Inflation rate
LRAS
AD
AS″
AS′
π_B
B
π_A
A
Y_A
Y^P
Output

10. *Use an AD/AS graph to show how a central bank's credibility helps stabilize inflation after a positive aggregate demand shock.*

    Suppose a positive aggregate demand shock shifts the AD curve to the right. If the central bank has credibility, expected inflation remains unchanged so the AS curve does not shift. Thus, the economy moves to point B such that both output and inflation are higher in the short run. If the central bank does not have credibility, people believe the central bank might accept higher inflation, so they raise their inflation expectations which is represented by an upward shift in the AS curve. That shift moves the economy to point C and leads to a further increase in inflation but a more moderate rise in output. Thus, central

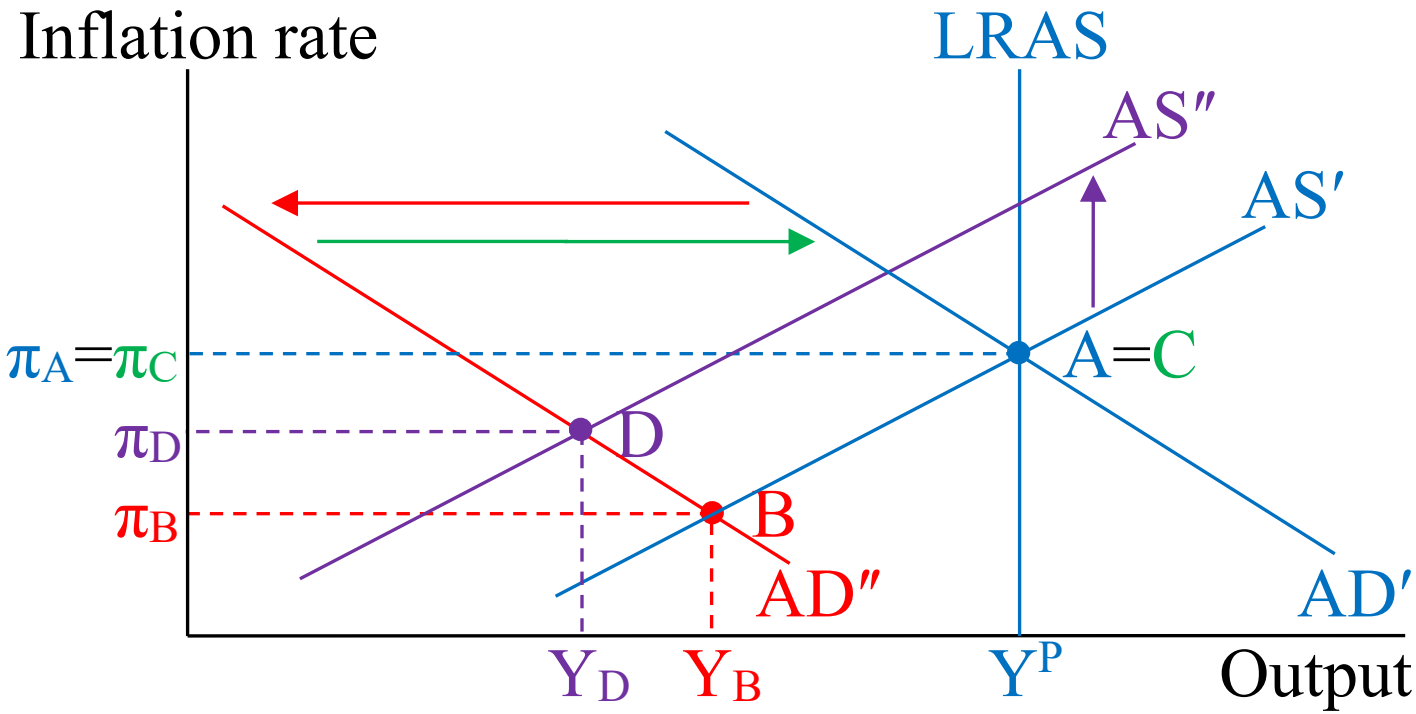
bank credibility helps stabilize inflation after a positive aggregate demand shock.



11. *Use an AD/AS graph to show how a central bank's credibility helps stabilize inflation and output after a negative aggregate demand shock.*

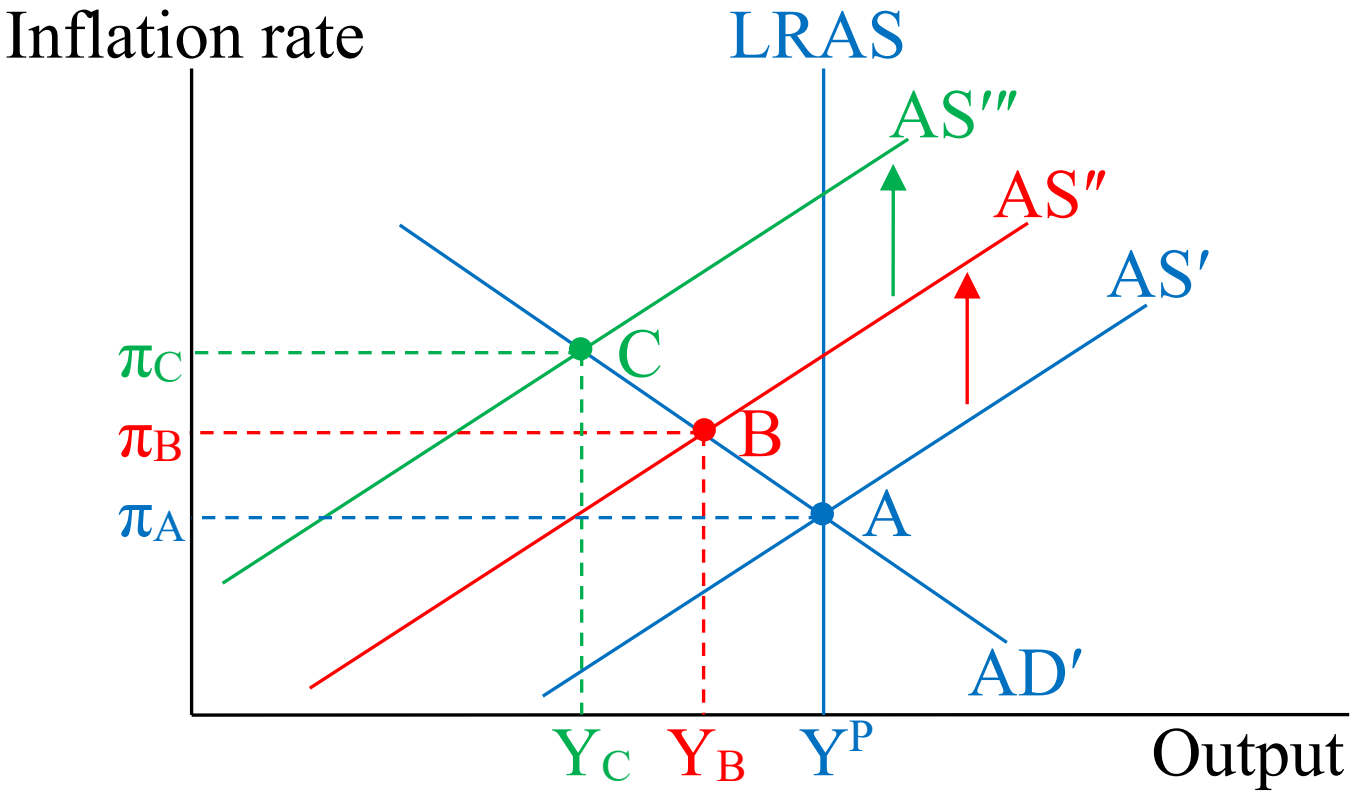
    Suppose a negative aggregate demand shock shifts the AD curve to the left and the economy moves to point B. To stabilize output, the central bank will ease monetary policy, which will shift the AD curve to the right and move the economy back to point A (or point C) over time. If the central bank has credibility, expected inflation remains unchanged so the AS curve does not shift. Thus, the economy will move back to point B such that both output and inflation will return to their original levels. If the central bank does not have credibility, people may view the monetary easing as inflationary, so they raise inflation expectations which is represented by an upward shift in the

AS curve. That shift moves the economy to point D and leads to a further reduction in output and a more moderate decline in inflation. Thus, central bank credibility helps stabilize output after a negative aggregate demand shock.



12. *Use an AD/AS graph to show how a central bank's credibility helps stabilize inflation and output after a negative short-run aggregate supply shock.*

    Suppose a negative aggregate supply shock shifts the AS curve up causing output to decline and inflation to increase. If the central bank has credibility, expected inflation remains unchanged so the economy moves to point B. If the central bank does not have credibility, people raise their inflation expectations which causes the AS curve shift up even more. The economy then moves to point C where the reduction in output and the rise in inflation are more enhanced. Thus, central bank credibility helps stabilize output and inflation after a negative aggregate supply shock.


Inflation rate
LRAS
AS‴
AS″
AS′
πC
πB
πA
C
B
A
AD′
YC
YB
YP
Output

13. *Use an AD/AS graph to show how a central bank's credibility helps stabilize the economy after disinflation.*

Suppose the central bank announces and implements its plan to lower the inflation rate by tightening policy, which shifts the AD curve to the left. If the central bank has little credibility, inflation expectations will remain unchanged so the AS curve will not shift and the economy will move to point B. As a result, output will decline by a large amount while inflation will drop modestly. If the central bank has some credibility, inflation expectations will fall as policy is tightened so the AS curve will shift down and the economy will move to point C. The decline in inflation expectations limits the fall in output and accelerates the drop in inflation. In the extreme case where the central bank has perfect credibility, inflation expectations will fall one-for-one with

the decline in inflation, so that output remains unchanged. In this case, the AS curve shift down and the economy moves to point D. Thus, output is stabilized after a disinflation when the central bank has credibility.