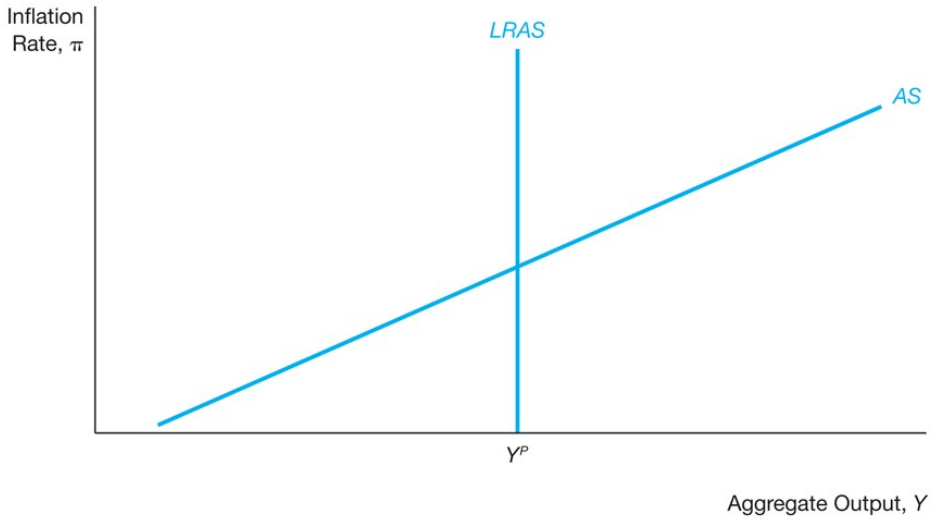
Aggregate demand and supply analysis

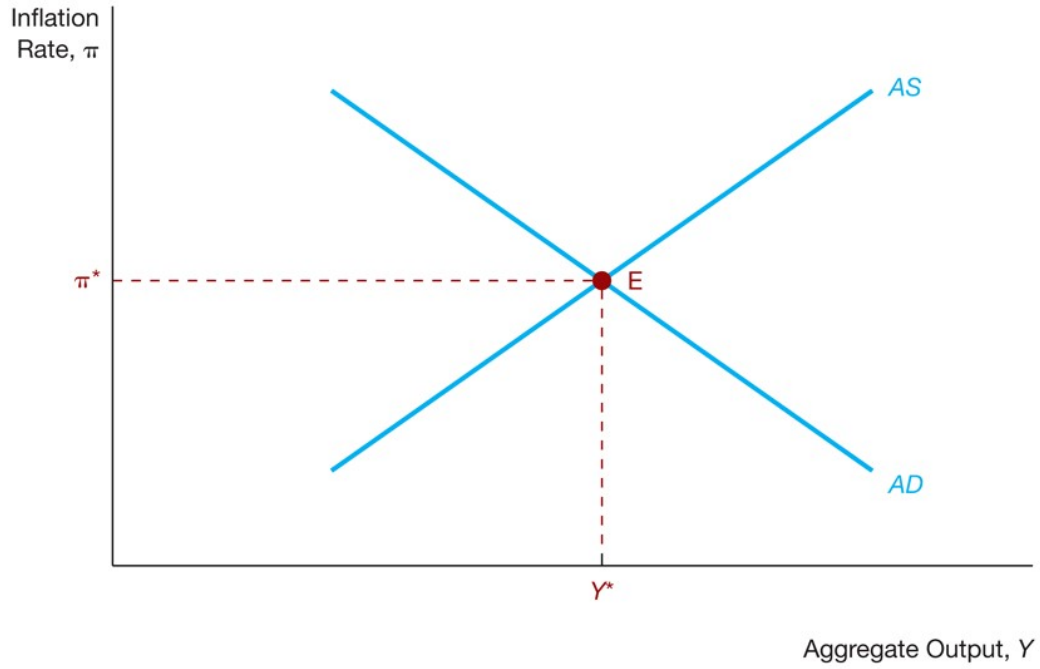
Aggregate Supply

- Long-run aggregate supply curve
  - Determined by amount of capital and labor and the available technology
  - Vertical at the natural rate of output generated by the natural rate of unemployment
- Short-run aggregate supply curve
  - Wages and prices are sticky
  - Generates an upward sloping *SRAS* as firms attempt to take advantage of short-run profitability when price level rises
  - Underlying inflation: consistent with full employment



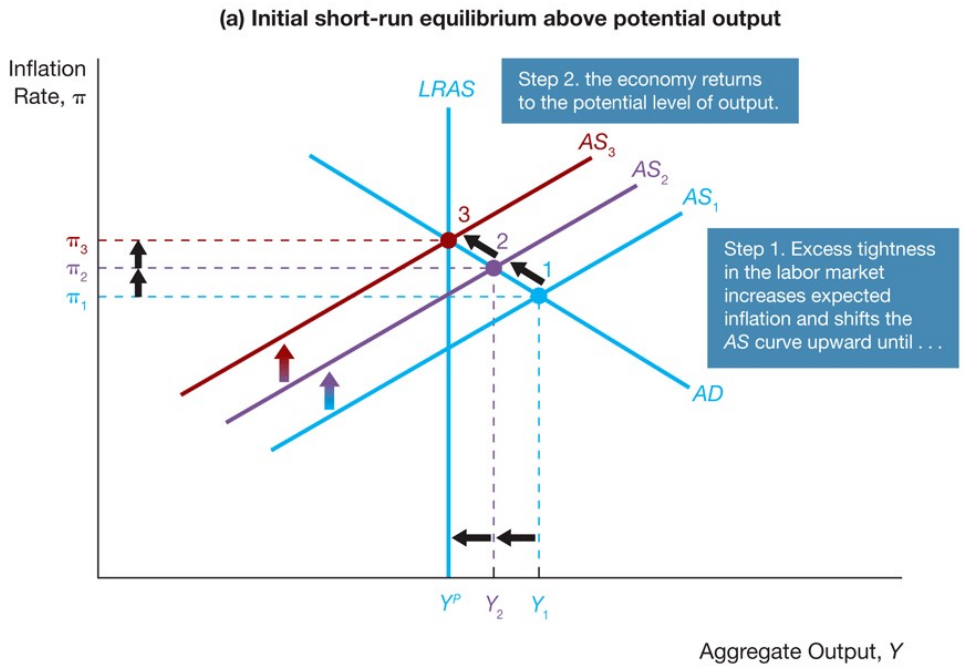
Aggregate Demand and Supply Analysis

- We can now put the aggregate demand and supply curves together to describe **general equilibrium** in the economy, when all markets are simultaneously in equilibrium at the point where the quantity of aggregate output demanded equals the quantity of aggregate output supplied
- Figure illustrates a short-run equilibrium in which the quantity of aggregate output demanded equals the quantity of output supplied



Self-Correcting Mechanism

- Regardless of where output is initially, it returns eventually to the natural rate
- **Slow**
  - Wages are inflexible, particularly downward
  - Scope for stabilization policies
- **Rapid**
  - Wages and prices are flexible
  - Less need for government intervention

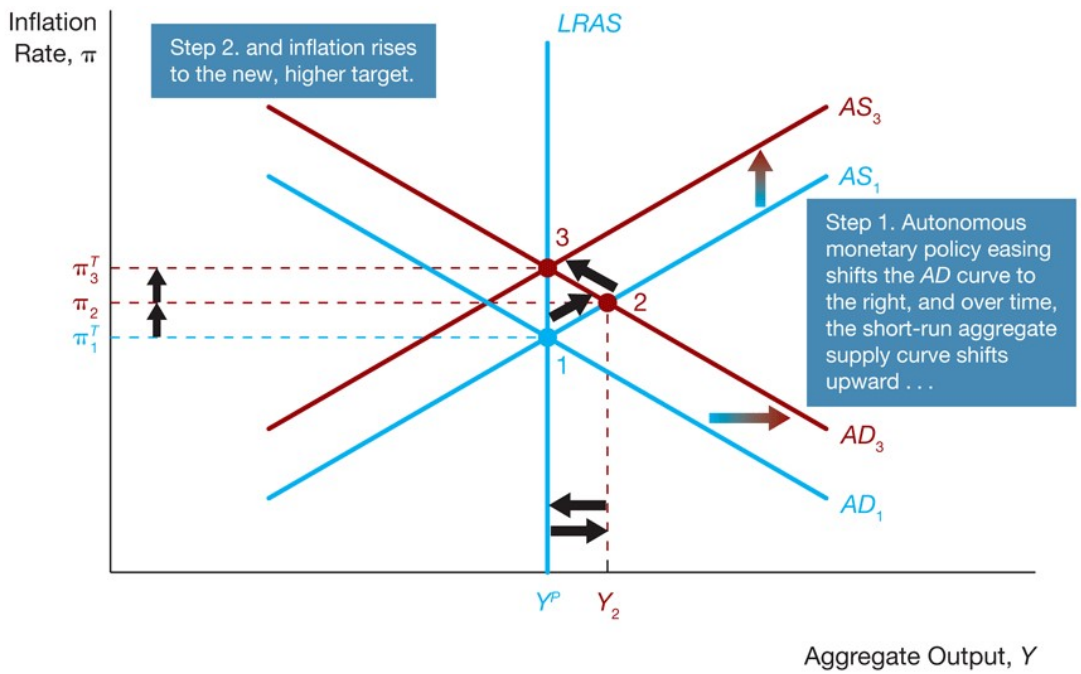


How Actively Should Policy Makers Try to Stabilize Economic Activity?

- All economists have similar policy goals (to promote high employment and price stability), yet they often disagree on the best approach to achieve those goals
  - **Nonactivists** believe government action is unnecessary to eliminate unemployment
  - **Activists** see the need for the government to pursue active policy to eliminate high unemployment when it develops

Inflation

- Always and Everywhere a Monetary Phenomenon
  - This adage is supported by our aggregate demand and supply analysis because it shows that monetary policy makers can target any inflation rate in the long run by shifting the aggregate demand curve with autonomous monetary policy
  - The figure shows what happens when the central bank rises its inflation target



Disinflation

Speed of D*AS* shift depends on speed with which *core inflation* adjusts.

Credibility vs stickiness

- Adaptive expectations: point 1
- Rational expectations
  - "If credibility is low, build reputation"
  - Recession to acquire credibility and move fast to 1''
    - Cold Turkey has less social costs
- New Keynesian
  - Sticky prices (menu) and wages (contracts)
    - Even if policy is credible, point 1'' is not at reach
    - Point 1' instead
  - Cost of disinflation is lower if the policy is credible, but gradualism is better than shock therapy

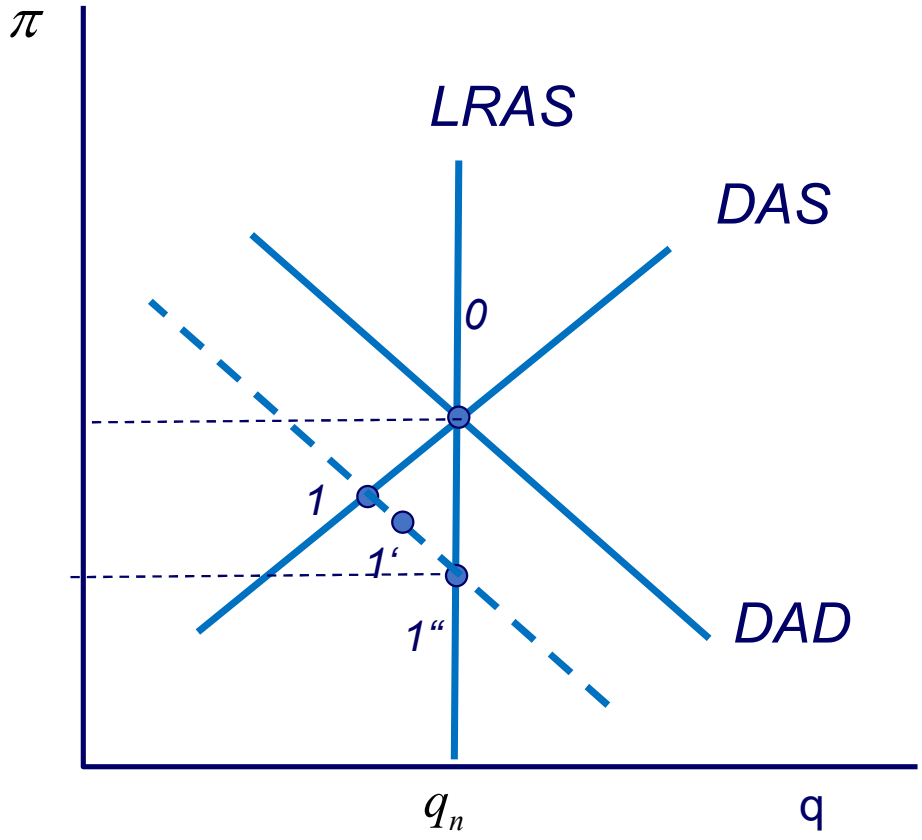
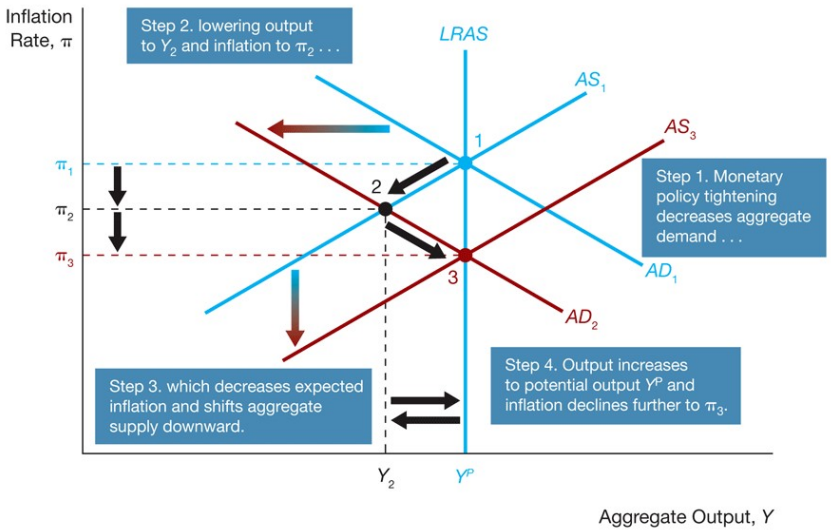


Figure 10 The Volcker Disinflation

(a) Aggregate Demand and Aggregate Supply Analysis



(b) Unemployment and Inflation, 1980–1986

Year	Unemployment Rate (%)	Inflation (Year to Year) (%)
1980	7.1	13.5
1981	7.6	10.3
1982	9.7	6.2
1983	9.6	3.2
1984	7.5	4.3
1985	7.2	3.6
1986	7.0	1.9

Source: Economic Report of the President.

Temporary demand shocks

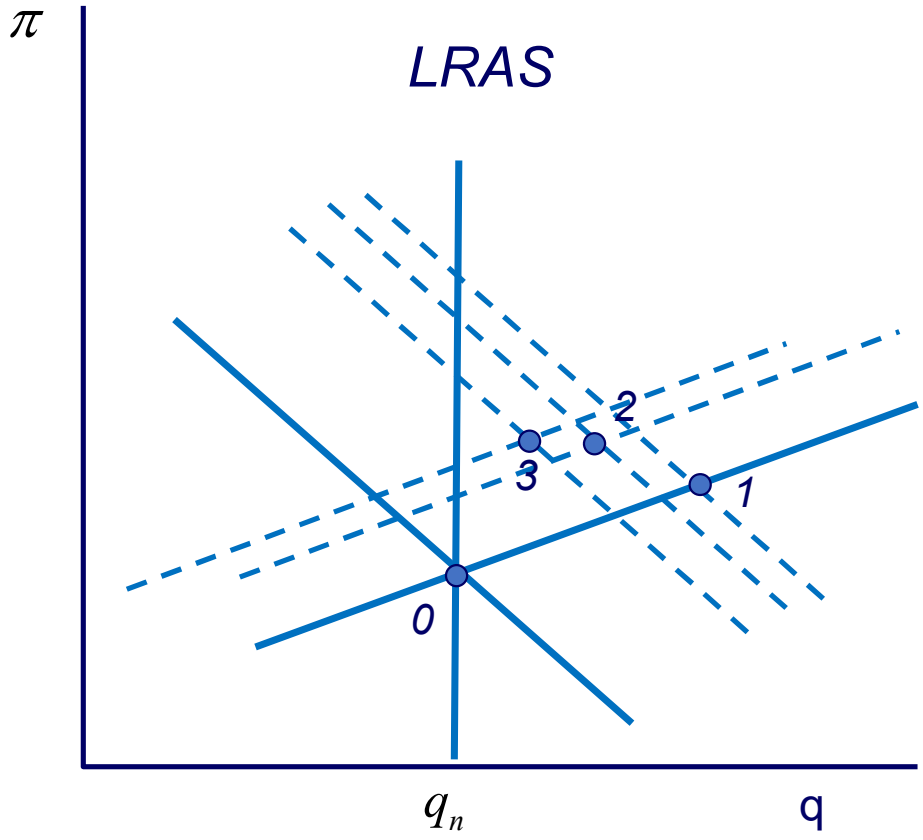
Temporary demand shock (investment surge)

1. No Policy response

- Long Run
  - AD returns to previous level
  - Output will return to natural level
- Temporary effect on output depends on:
  - The slope of the AS (fraction of firms that cannot adjust prices)
  - **Speed** at which the AD curve in the return to the initial level
  - Credibility (affects inflation expectations)

2. Policy response: AD contraction to neutralize

- In the case of aggregate demand shocks, there is no tradeoff between the pursuit of price stability and economic activity stability

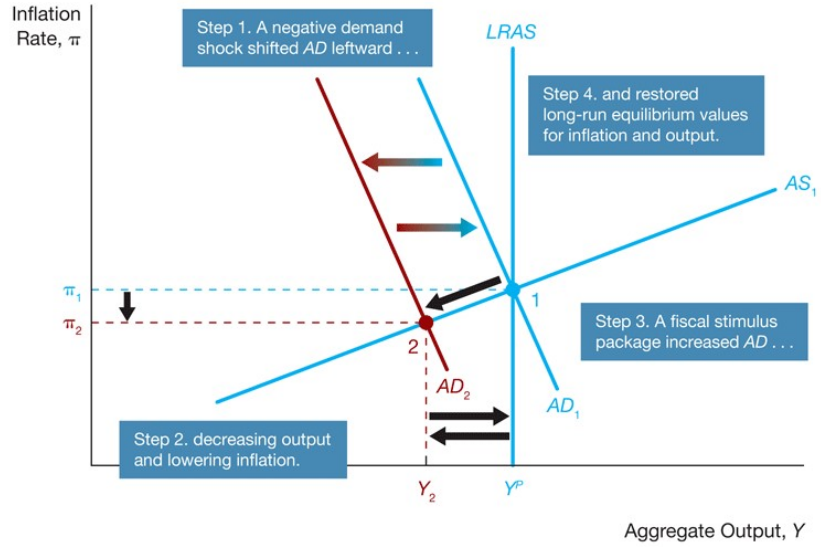


China and the Financial Crisis, 2007–2009

Policy response: AD contraction to neutralize

In the case of aggregate demand shocks, there is no tradeoff between the pursuit of price stability and economic activity stability

(a) Aggregate Demand and Aggregate Supply Analysis



(b) Chinese Output Growth and Inflation, 2006–2009

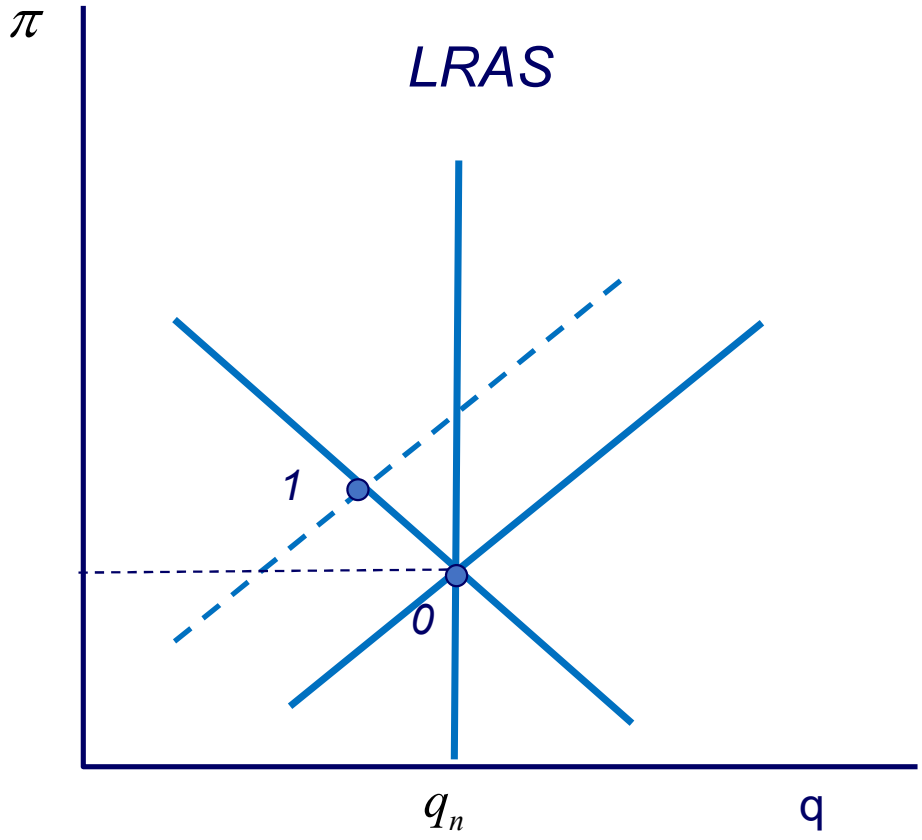
Year	Output Growth (%)	Inflation (Year to Year) (%)
2006	11.8	1.5
2007	12.4	4.8
2008, June	11.2	7.9
2008, Dec.	4.4	3.9
2009, June	11.1	–1.1
2009, Dec.	10.4	–0.3

Source: International Monetary Fund. 2010. International Financial Statistics. Country Tables, February. http://=www.imfstatistics.org/IMF/imfbrowser.aspx?docList=pdfs&path=ct%2f20100201%2fct_pdf%2f20100121_CHN.pdf.

Temporary supply shocks

Temporary supply shock

- Temporary supply shocks
  - Restriction in supply, oil price shock, disruption in international trade …
  - The AS will move more the lower the credibility
- Impact on inflation/employment depends on how elastic is the AD curve (point 1)
  - How sloped is the IS curve
  - The automatic response of CB to inflation (slope of the TR curve)
- Impact (point 1)
  - Stagflation
  - If the credibility of the nominal anchor is weak, then inflation expectations will rise, so the short-run AS curve will shift further up and to the left, causing even higher inflation and lower output
  - Inflation inertia (via expectations) may cause persistent increase in inflation
- In the long run, output and inflation will be unchanged (holding the aggregate demand curve constant)



Temporary supply shock

- Policy responses:
  - Accommodation (Policy stabilizes economic activity in the short run): point 2
  - Extinction (Policy stabilizes inflation in the short run): point 3
  - Stick to TR (point 1)

➢When a supply shock is temporary, policymakers face a short-run tradeoff between stabilizing inflation and economic activity

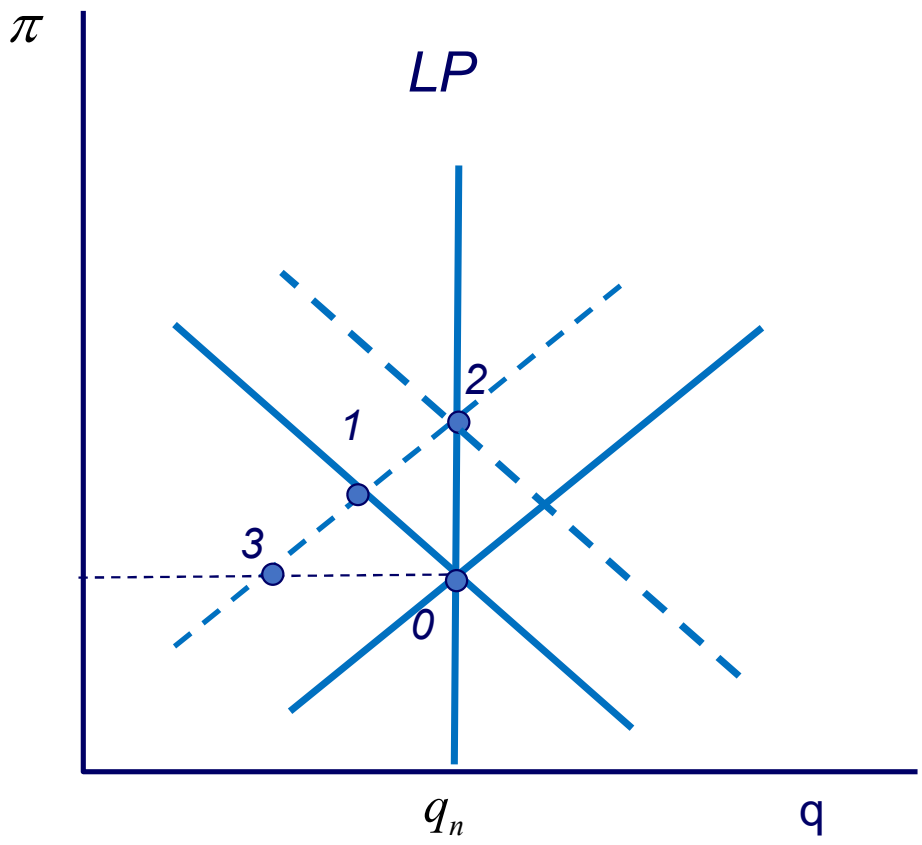
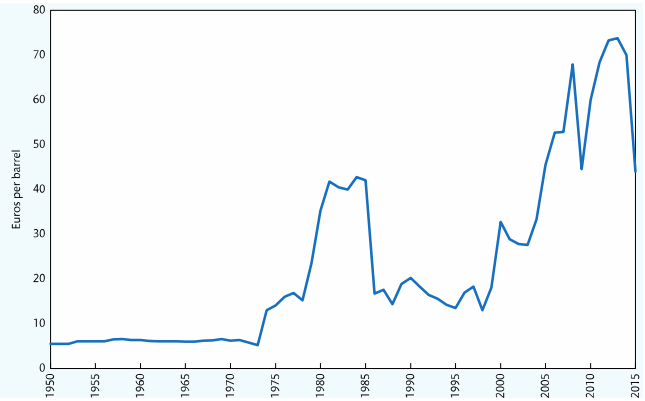
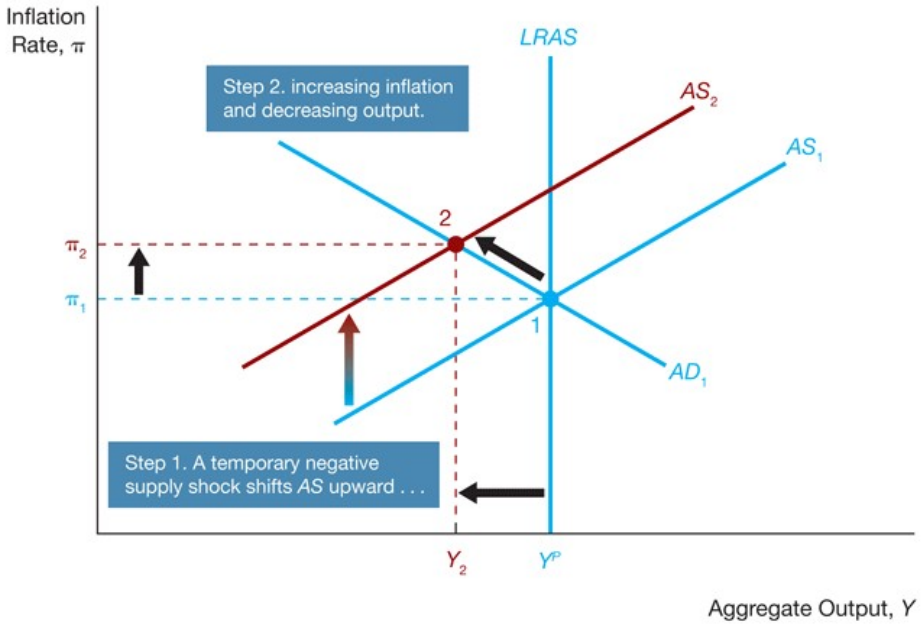


Figure 13 Negative Supply Shocks, 1973–1975 and 1978–1980

Nominal Oil Price (Euros per Barrel): 1950-2015



(a) Aggregate Demand and Aggregate Supply Analysis



(b) Unemployment and Inflation, 1973–1975 and 1978–1980

Year	Unemployment Rate (%)	Inflation (Year to Year) (%)
1973	4.8	6.2
1974	5.5	11.0
1975	8.3	9.1
1978	6.0	7.6
1979	5.8	11.3
1980	7.1	13.5

Source: Economic Report of the President.

Figure 7 Response to a Temporary Aggregate Supply Shock: Short-Run Output Stabilization

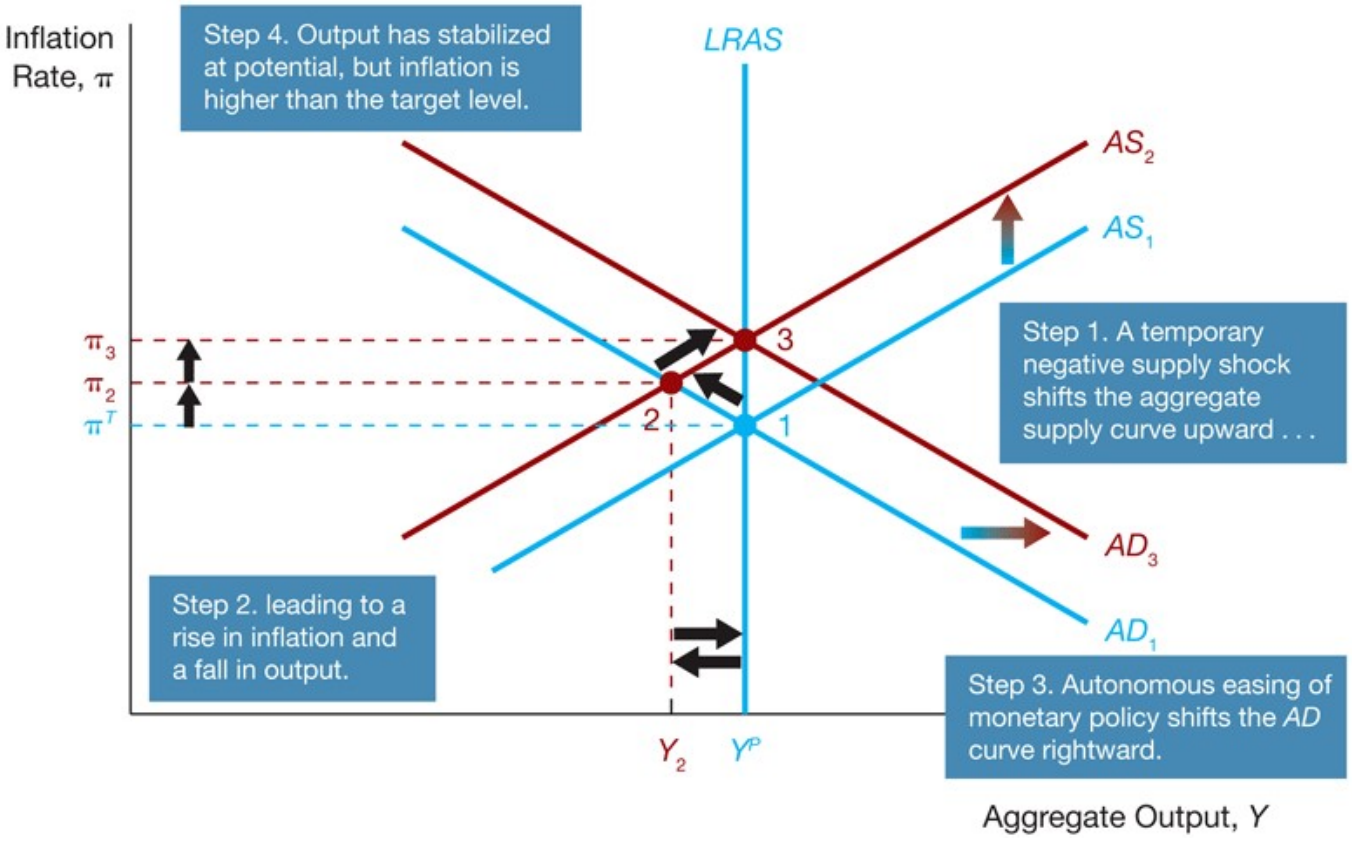
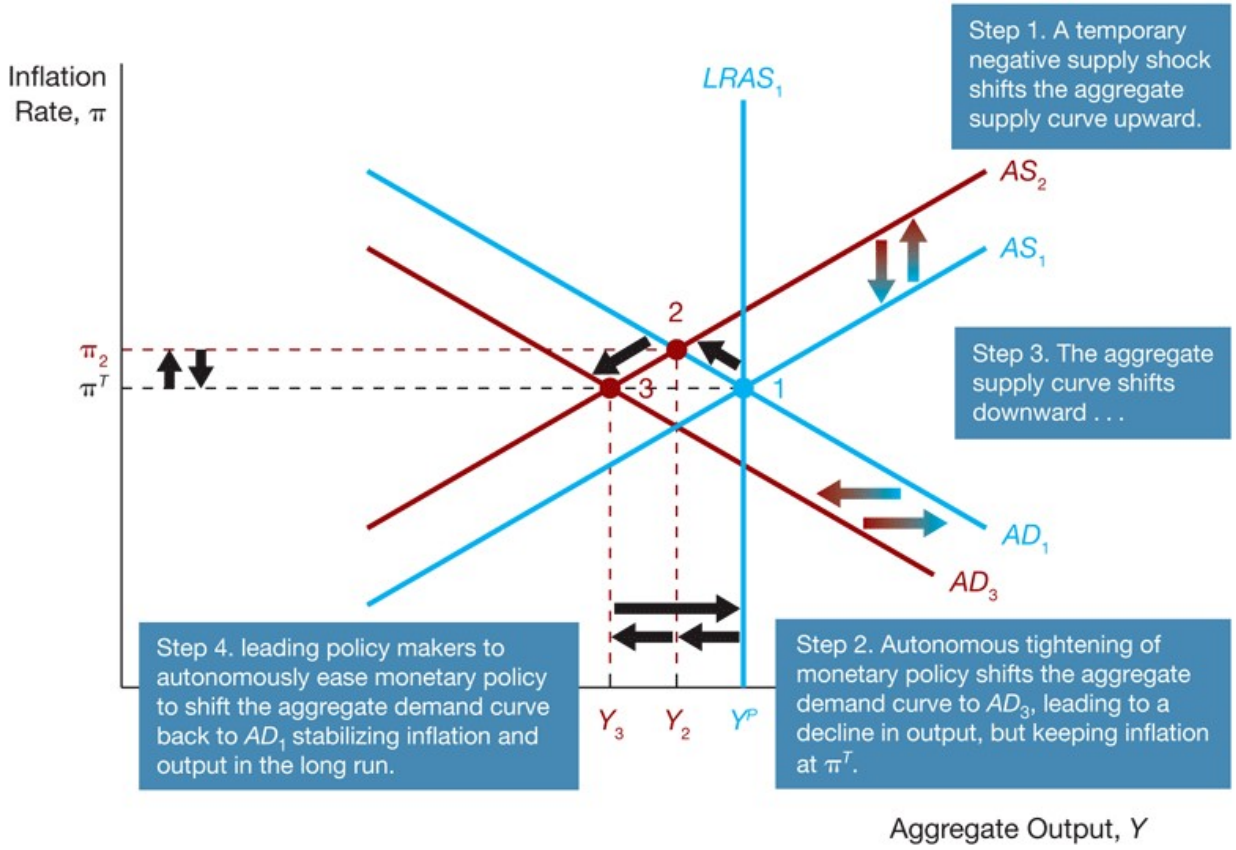


Figure 6 Response to a Temporary Aggregate Supply Shock: Short-Run Inflation Stabilization



Cost-Push Inflation

Cost-push inflation results either from a temporary negative supply shock or a push by workers for wage hikes beyond what productivity gains can justify

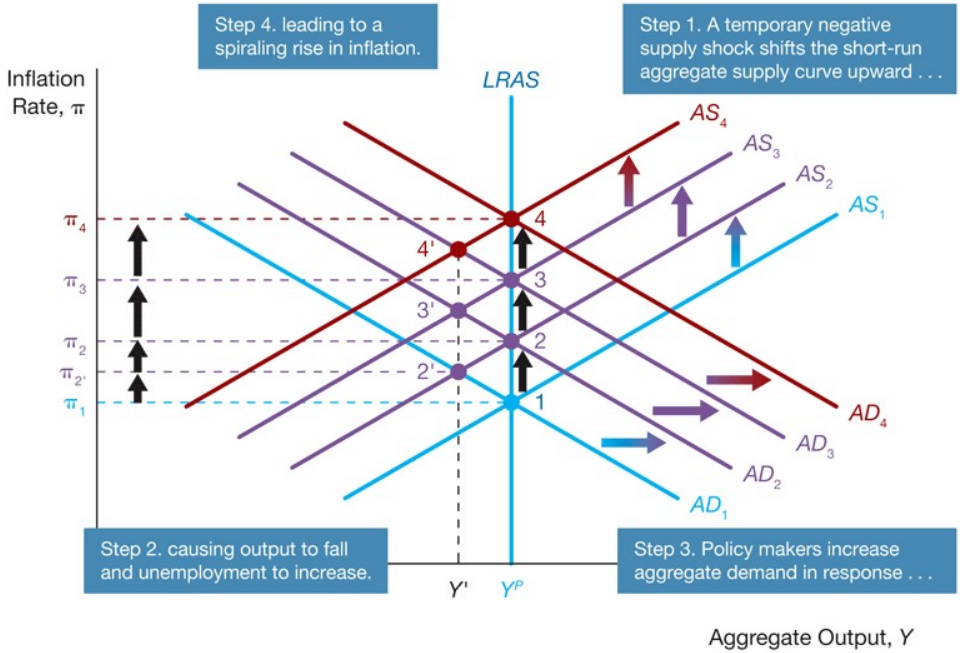
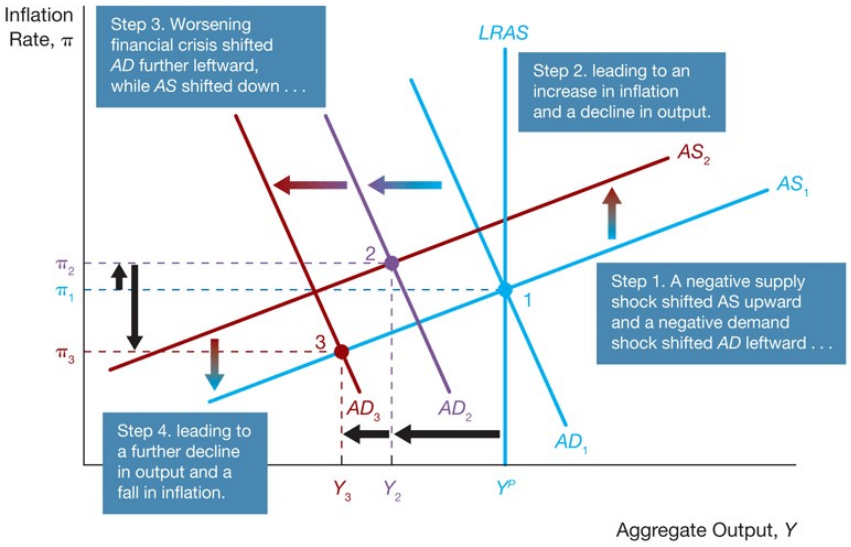


Figure 16 Negative Supply and Demand Shocks and the 2007–2009 Crisis

(a) Aggregate Demand and Aggregate Supply Analysis



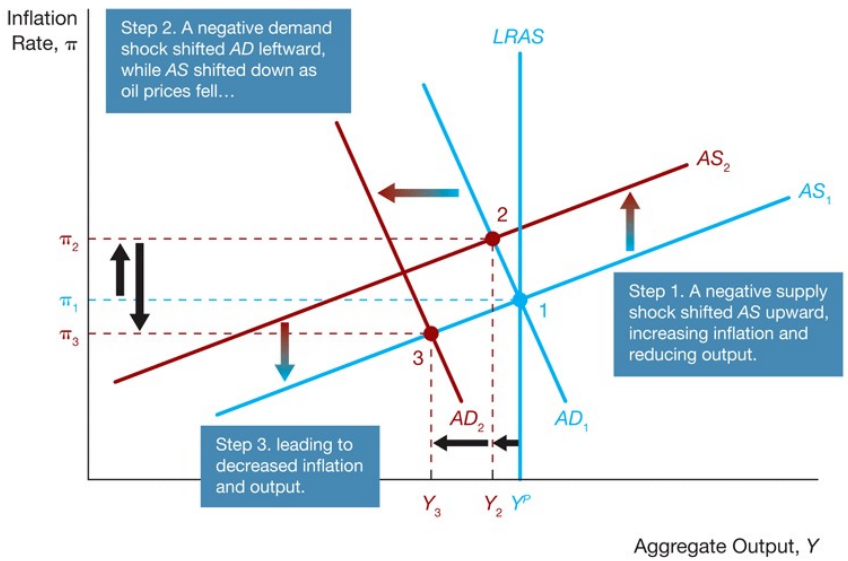
(b) Unemployment and Inflation During the Perfect Storm of 2007–2009

Year	Unemployment Rate (%)	Inflation (Year to Year) (%)
2006	4.6	2.5
2007	4.6	4.1
2008, June	5.5	5.0
2008, Dec.	7.2	0.1
2009, June	9.5	–1.2
2009, Dec.	10.0	2.8

Source: Economic Report of the President.

Figure 17 UK Financial Crisis, 2007–2009

(a) Aggregate Demand and Aggregate Supply Analysis



(b) Unemployment and Inflation, 2006–2009

Year	Unemployment Rate (%)	Inflation (Year to Year) (%)
2006	5.4	2.3
2007	5.3	2.3
2008, June	5.3	3.4
2008, Dec.	6.4	3.9
2009, June	7.8	2.1
2009, Dec.	7.8	2.1

Source: Office of National Statistics, UK. www.statistics.gov.uk/statbase/tsdtimezone.asp.

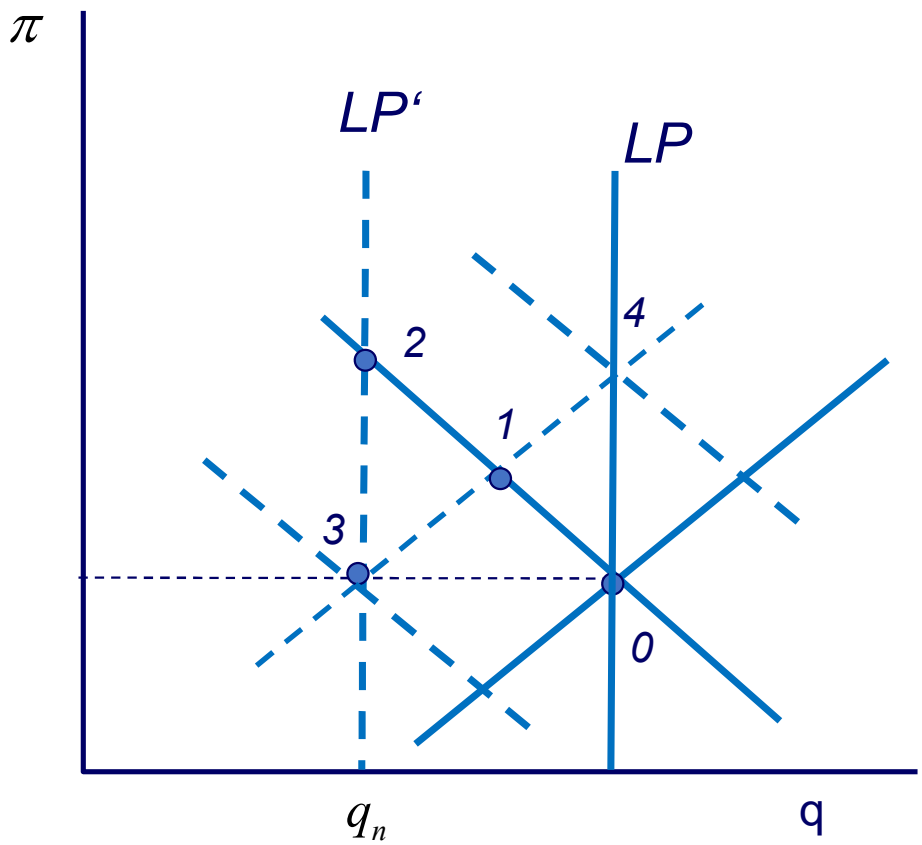
Permanent supply shocks

Permanent Supply Shocks and Real Business Cycle Theory

- A permanent negative supply shock—such as an increase in ill-advised regulations that causes the economy to be less efficient, thereby reducing supply—would decrease potential output and shift the long-run aggregate supply curve to the left
- Because the permanent supply shock will result in higher prices, there will be an immediate rise in inflation and so the short-run aggregate supply curve will shift up and to the left
- One group of economists, led by Edward Prescott of Arizona State University, believe that business cycle fluctuations result from permanent supply shocks alone and their theory of aggregate economic fluctuations is called **real business cycle theory**

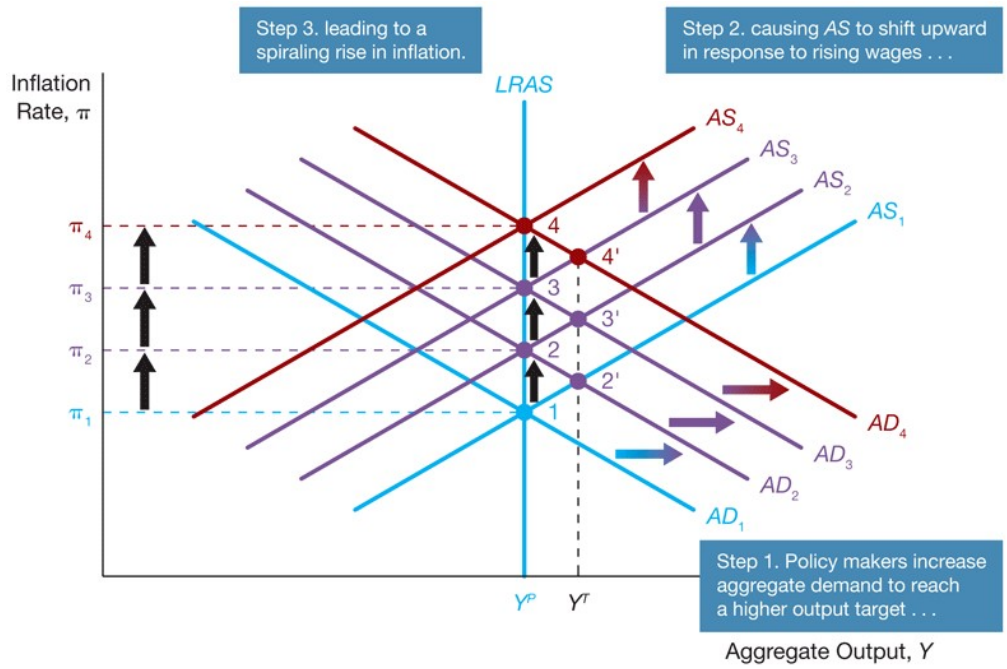
Permanent supply shock

- The LP curve shifts when there is:
  - A change in the total amount of capital or labor in the economy
  - A change in technology
  - A decline in the natural rate of unemployment (lower markup, labour unions, etc)
- Impacts (no discretionary policy response)
  - Short-run: point 1
  - Long run: point 2
    - Real Business cycles school: there is nothing the government can do to avoid the permanent fall in output
- Policy responses to a permanent supply shock
  - Extinction: point 3
  - Demand pull inflation: point 4
    - ➢ (in the early 1970s, policymakers mistakenly underestimated the natural rate of unemployment)



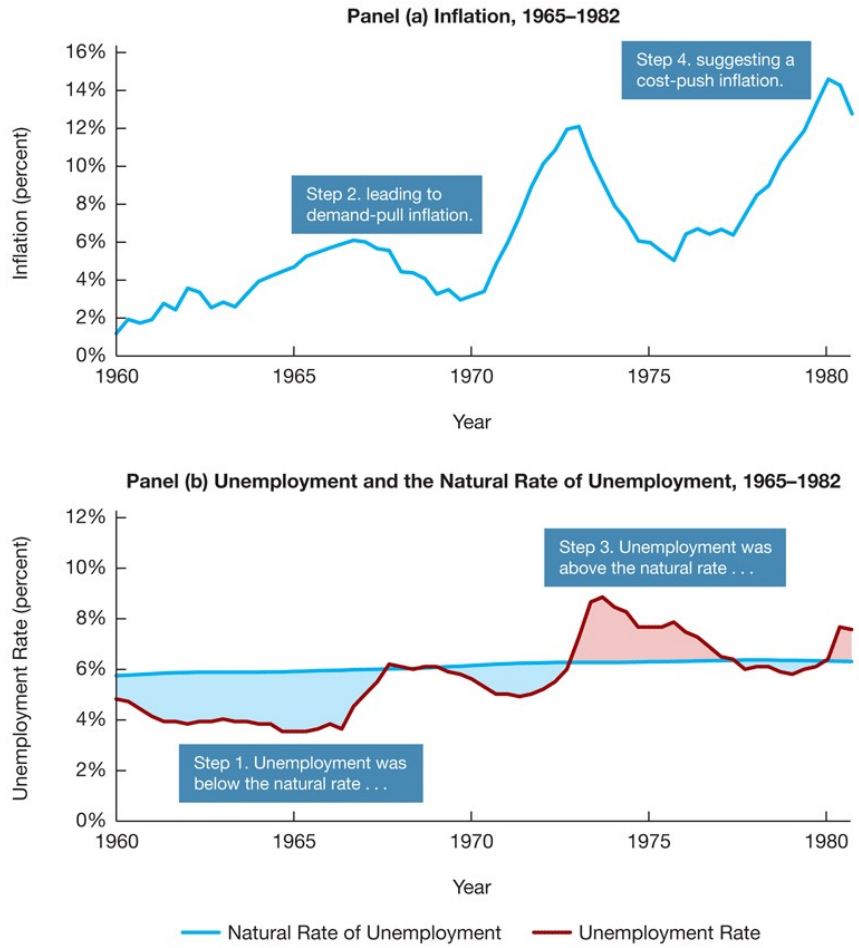
Demand-Pull Inflation

Demand-pull inflation results from policy makers pursuing policies that increase aggregate demand



APPLICATION The Great Inflation

- Now that we have examined the roots of inflationary monetary policy, we can investigate the causes of the rise in U.S. inflation from 1965 to 1982, a period dubbed the "Great Inflation"
- Panel (a) of Figure 11 documents the rise in inflation during those years. Just before the Great Inflation started, the inflation rate was below 2% at an annual rate; by the late 1970s, it averaged around 8% and peaked at nearly 14% in 1980 after the oil price shock in 1979
- Panel (b) of Figure 11 compares the actual unemployment rate to estimates of the natural rate of unemployment



Conclusions

Impact of shocks

1. A shift in the aggregate demand curve affects output only in the short run and has no effect in the long run
2. A temporary supply shock affects output and inflation only in the short run and has no effect in the long run (holding the aggregate demand curve constant)
3. A permanent supply shock affects output and inflation both in the short and the long run
4. The economy has a self-correcting mechanism that returns it to potential output and the natural rate of unemployment over time

Policy options

1. If most shocks to the economy are aggregate demand shocks or permanent aggregate supply shocks, then policy that stabilizes inflation will also stabilize economic activity, even in the short run.
2. If temporary supply shocks are more common, then a central bank must choose between the two stabilization objectives in the short run.
   - Following a temporary supply shock, policy makers can achieve either price stability or economic activity stability, but not both.
   - This tradeoff poses a dilemma for central banks with dual mandates
3. In the long run there is no conflict between stabilizing inflation and economic activity in response to shocks.