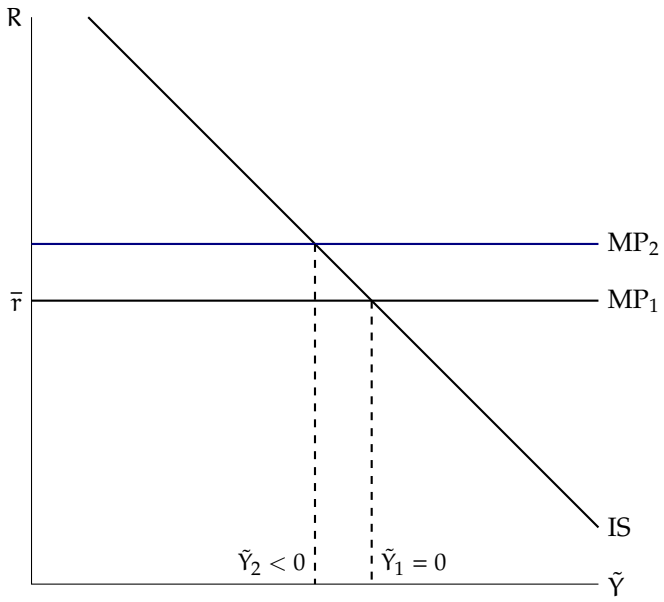
Raising the Nominal Interest Rate

Suppose the Fed announces today that it is raising the federal funds rate by 50 basis points. Using the IS-MP diagram, explain what happens to economic activity in the short run. What is the economics underlying this response in the economy?



In the short run, the output gap shifts in the negative direction. Since we are assuming that $\tilde{Y}_1$ is zero, we get that the output gap goes negative, because the higher interest rate means companies invest less and consumers buy less.

Your Day as Chair of the Federal Reserve

With the goal of stabilizing output, explain how and why you would change the interest rate in response to these various shocks. Show the effects on the economy with an IS-MP diagram.

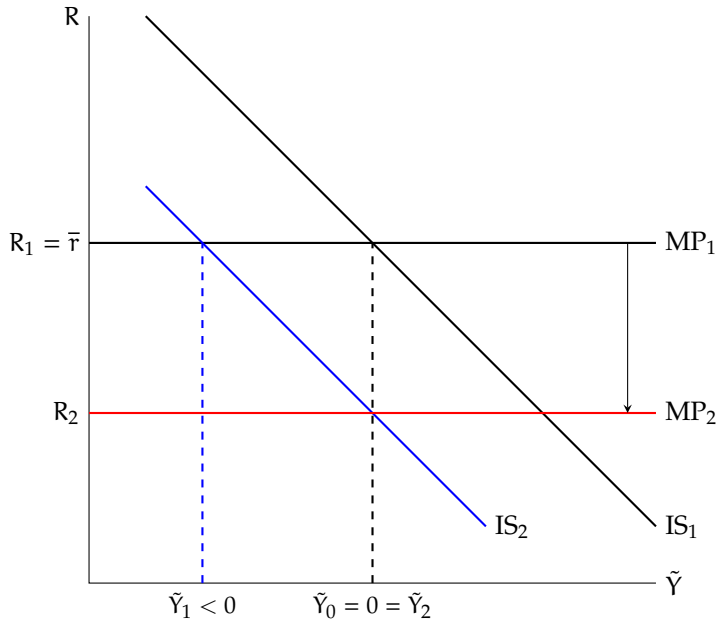
(a) Consumers become pessimistic about the state of the economy and future productivity.

(b) A booming economy in Europe this year leads to an unexpected increase in demand by European consumers of US goods.

(c) Americans develop an infatuation with all things made in New Zealand.

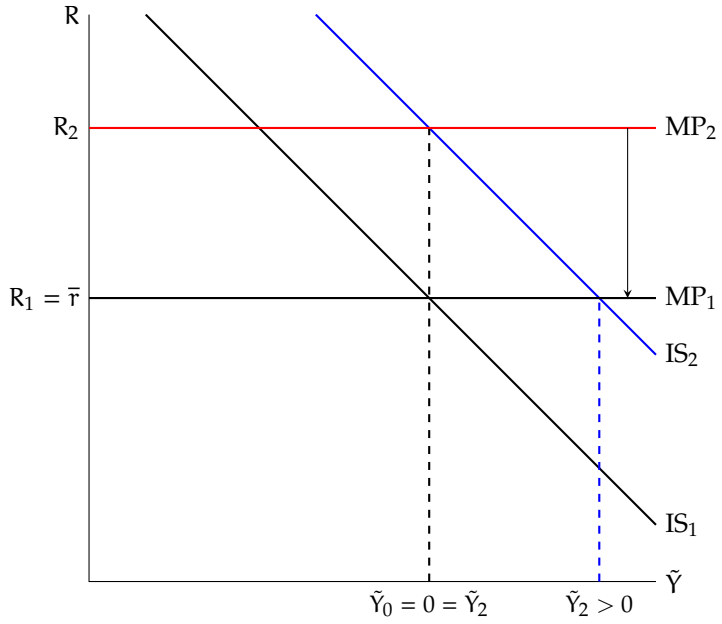
(a)

Consumer pessimism about the state of the economy causes them to cut back on spending, which leads to the IS curve shifting inward. This is counteracted by interest rates shifting downward to ensure that the economy is at potential output.



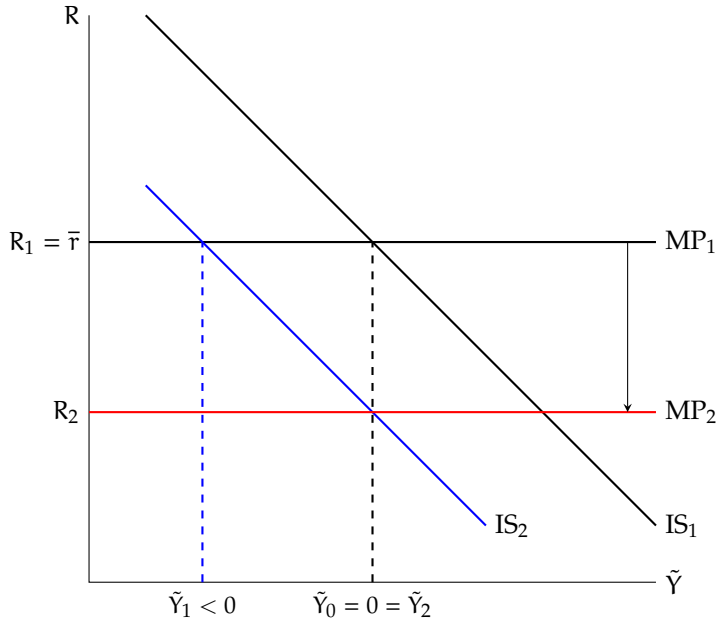
(b)

An increase in exports leads the IS curve to shift outward, meaning that the central bank raises rates to ensure that the economy doesn't run too hot



(c)

The increase in imports from New Zealand reduces output within the country as imports crowd out domestic consumption, so the central bank lowers rates to stimulate the domestic economy.



The Summary Diagram

The end of section 12.4 in the textbook contains a summary diagram (recreated below) of the short-run model. Explain the economic reasoning that underlies each step in this summary. How does this summary diagram illustrate the essence of the Volcker disinflation?

Summary: The Short-Run Model

MP Curve: $\uparrow i_t \Rightarrow \uparrow R_t$

IS Curve: $\uparrow R_t \Rightarrow \downarrow \tilde{Y}_t$

Phillips Curve: $\downarrow \tilde{Y}_t \Rightarrow \downarrow \pi_t$

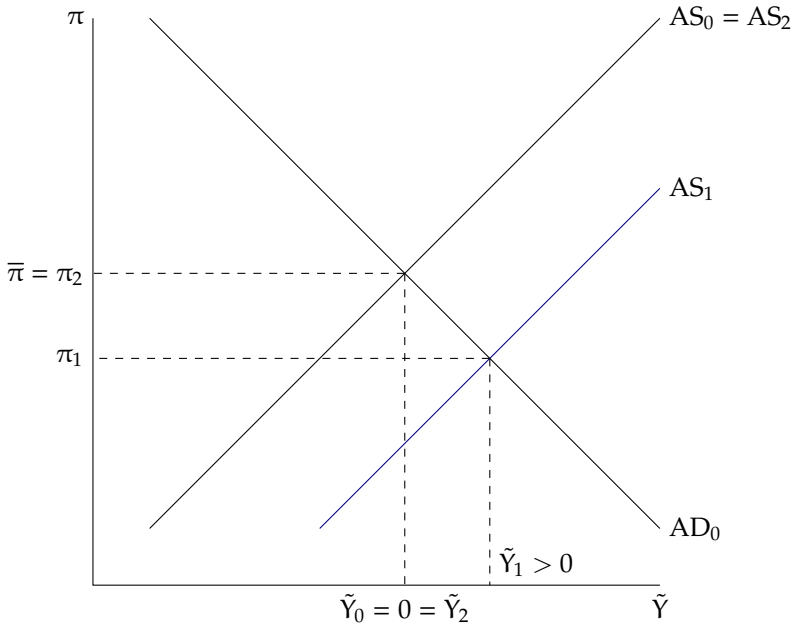
MP Curve In the MP curve, we raise the nominal interest rate, which raises the real interest rate.

IS Curve When the real interest rate increases, investment and output slow as firms and households face higher borrowing costs.

Phillips Curve As output slows, inflation falls because there is less pressure for higher wages and employment as a result of lower output.

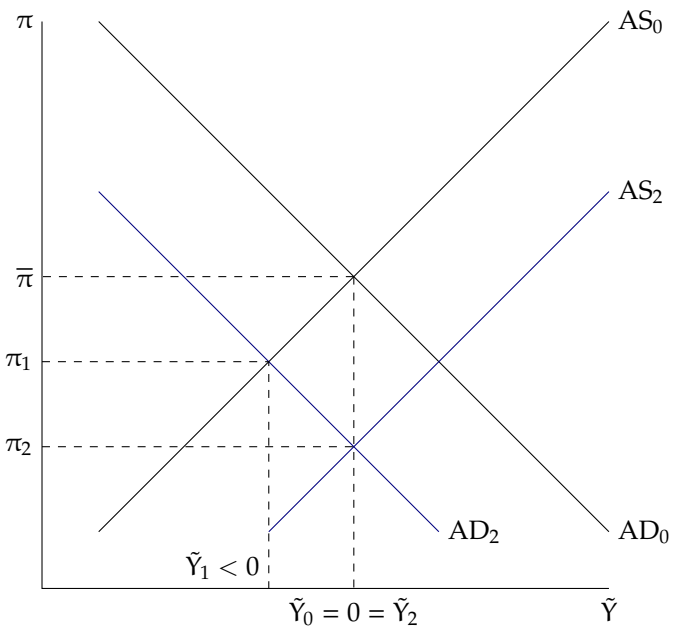
A Negative Oil Price Shock

It is common to blame some of the poor macroeconomic performance of the 1970s on the rise in oil prices. In the middle of the 1980s, however, oil prices declined sharply. Using the AS-AD framework, graphically depict the macroeconomic consequences of a one-time negative shock to the inflation rate, as might occur because of a sharp decline in oil prices.



A Decline in Foreign Demand for U.S. Goods

Suppose the European and Japanese economies succumb to a recession and reduce their demand for U.S. goods for several years. Using the AS- AD framework, graphically depict the macroeconomic consequences of this shock, both immediately and over time.



The Taylor Rule

John Taylor of Stanford University proposed the following monetary policy rule:

$$R_t - \overline{r} = \overline{m}(\pi_t - \overline{\pi}) + \overline{n}\tilde{Y}_t$$

That is, Taylor suggests that monetary policy should increase the real interest rate when output exceeds potential.

(a) What is the economic rationale for such a policy rule?

(b) Combine this policy rule with the IS curve to derive a new aggregate demand curve. How does it differ from the standard AD curve? Consider the response of the output gap to aggregate demand shocks and inflation shocks.

(a)

The economic rationale is that a higher output gap yields greater inflationary pressures, so increasing the real interest rate as the output gap increases is warranted.

(b)

$$\tilde{Y}_t = \overline{a} - \overline{b}(R_t - \overline{r}) \qquad \text{IS Curve}$$

$$\tilde{Y}_t = \overline{a} - \overline{b}\left(\overline{m}(\pi_t - \overline{\pi}) + \overline{n}\tilde{Y}\right) \qquad \text{Include Taylor Rule}$$

$$(1 + \overline{b}\overline{n})\tilde{Y}_t = \overline{a} - \overline{b}\overline{m}\,(\pi_t - \overline{\pi})$$

$$\tilde{Y}_t = \frac{1}{1 + \overline{b}\overline{n}}\left(\overline{a} - \overline{b}\overline{m}(\pi_t - \overline{\pi})\right)$$

According to this equation, we see a *greater* interest rate response as the output gap increases (or goes negative), meaning that the Taylor rule yields effective countercyclical monetary policy.

Deflation

The Japanese economy at the end of the 1990s and into the 2000s experienced several periods of deflation. The monetary policy rule is $R_t - \overline{r} = \overline{m}(\pi_t - \overline{\pi})$, where $\overline{r} = 2\%$, $\overline{m} = \frac{1}{2}$, and $\overline{\pi} = 2\%$.

(a) Compute the nominal interest rate implied by the policy rule when the inflation rate takes the following values: 1%, 0%, and −1%.

(b) Is it possible for the nominal interest rate to be negative? Why or why not?

(c) What does your answer to (b) mean about monetary policy during deflation?

(d) If a central bank wants to end deflation and stimulate the economy, what can it do?

(a)

- If the inflation rate is 1%, then the implied policy rate is 1.5%.
- If the inflation rate is 0%, then the implied policy rate is 1%.
- If the inflation rate is −1%, then the implied policy rate is 0.5%.

(b)

It is not possible for the nominal interest rate to be negative, because that would entail paying depositors to deposit money at the bank, which is not possible for any bank, as banks must make a profit.

(c)

Monetary policy during deflation is impossible using traditional tools of monetary policy (such as interest rates), precisely because it is impossible to drop interest rates below zero. If the central bank cannot credibly stimulate the economy, it is virtually impossible to get out of a deflationary spiral.

(d)

If a central bank wants to end deflation, it can try to use unconventional monetary policy such as quantitative easing (where it buys government bonds and other financial instruments to increase the money supply), and it can also request policymakers to implement fiscal policy to stimulate the economy.

True/False

Determine whether the following statements are either true, false, or uncertain, and explain why.

(a) If the Federal Reserve wants to stimulate the economy in the short run, it will reduce the monetary supply.

(b) An economy with a hawkish central bank will have a steeper aggregate demand curve than an economy with a dovish central bank.

(a) This statement is **false**, as central banks that want to stimulate the economy will *increase* the money supply rather than decrease it.

(b) This statement is **false** — an economy with a hawkish central bank will see a stronger interest rate response to inflation, meaning that the output gap will be higher if inflation increases, so the aggregate demand curve will be *shallow*.