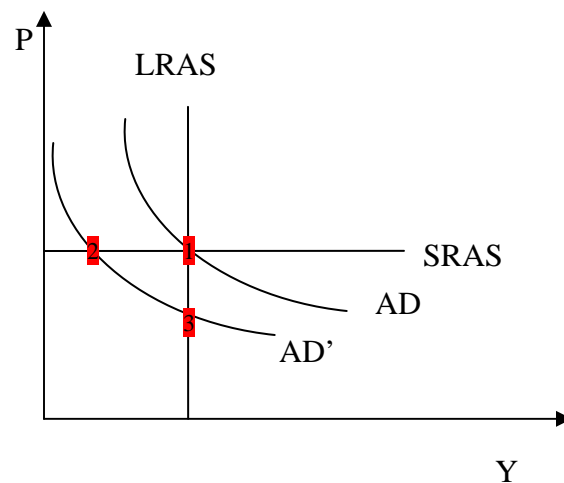


Some Answers

- 1) **a.** During the Depression, the Federal Reserve enacted policies that reduced the money supply. Sketch a graph and on it indicate what this would do to the aggregate demand and aggregate supply curves in the short run if output were originally at its natural level. What would happen to output and the aggregate price level in the short run?
- b.** On the same graph, indicate what would happen to the short-run aggregate supply and aggregate demand curves over time if there were no further reductions in the money supply. Consequently, what would happen to output and price level over time?
- c.** What is the final effect of this policy on output and the price level in the long run?

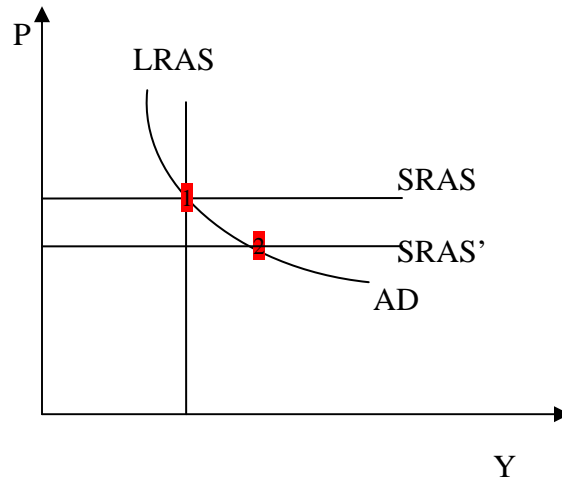
Reduction of the money supply shifts the Aggregate Demand schedule and brings the economy from 1 to 2 in the short run. If the Fed does nothing else, the economy would find its way to 3 by a slow movement along the AD' curve (or equivalently, shifts in the SRAS curve). The FINAL effect is no long run change in output, but a permanently lower price level.



2) Throughout much of the 1990s, the United States experienced declining energy prices. Assume that the U.S. economy was in long-run equilibrium before these declines began.

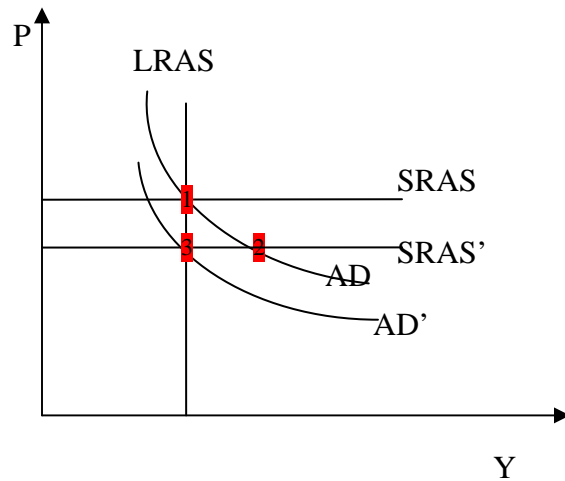
a. Use the aggregate demand-aggregate supply model to illustrate graphically the short-run AND long-run impact of this decline on output and prices.

A decline in energy prices shifts the SRAS curve down, so the new short-run equilibrium moves from 1 to 2. Over the long run, however, prices will rise back up to their original level and the long-run equilibrium reverts back to 1.



b. If the Federal Reserve attempted to offset this deviation from the natural rate in the short run, should the money supply be increased or decreased? Illustrate graphically.

The Fed would decrease the money supply to prevent the “over-heating” of the economy, thus shifting the AD curve to the left. This gets the economy back to its long-run output level with a permanently lower price level.



- 3) Let's examine how the goals of the Fed influence its response to shocks. Suppose Fed A cares only about keeping the price level stable, and Fed B cares only about keeping output and employment at their natural rates. Explain how each Fed would respond to:

- a. an exogenous INCREASE in the demand for money.

An increase in money demand will shift the Aggregate Demand curve to the LEFT (think about it – if people are demanding more money, they are less willing to spend it on goods and services). If nothing else changes, the economy will be in a recession for some time, and prices will fall slowly bringing the economy back to its long-run output level. Thus both Fed A and Fed B will want to expand the money supply – keeping prices steady AND quickly getting the economy back to full employment.

- b. an exogenous INCREASE in the price of oil.

With this upward shift in the Short Run Aggregate Supply curve, Fed A SHOULD DO NOTHING! Prices have already risen, and the Fed must simply wait it out for prices to fall back down to their original levels.

Fed B on the other hand should increase the money supply. This will shift the Aggregate Demand curve to the right, returning the economy quickly to full employment, but at a permanently higher price level.

- 4) Consider the impact of an increase in thriftiness in the Keynesian cross. Suppose the consumption function is $C = a + c(Y - T)$, where a is a parameter called *autonomous consumption* and c is the marginal propensity to consume.

a. What happens to equilibrium income when the society becomes more thrifty, as represented by a decline in a .

If society becomes more thrifty – meaning that for any given level of income people save more and consume less – then the planned-expenditure function shifts downward. Equilibrium income falls (by the way, how much does this income fall by? Ans: $1/(1-MPC)$ times the decline in a).

b. What happens to equilibrium saving? Why do you suppose this result is called the *paradox of thrift*?

Equilibrium saving remains unchanged. The national accounts identity tells us that saving equals investment, or $S = I$. In the Keynesian-cross model, we assumed that desired investment is fixed. This assumption implies that investment is the same in the new equilibrium as it was in the old. We can conclude that saving is exactly the same in both equilibria.

The paradox of thrift is that even though thriftiness increases, saving is unaffected. Increased thriftiness leads only to a fall in income. For an individual, we usually consider thriftiness a virtue. From the perspective of the Keynesian cross, however, thriftiness is a vice.

c. Does this paradox arise in the classical model of Chapter 3? Why or why not?

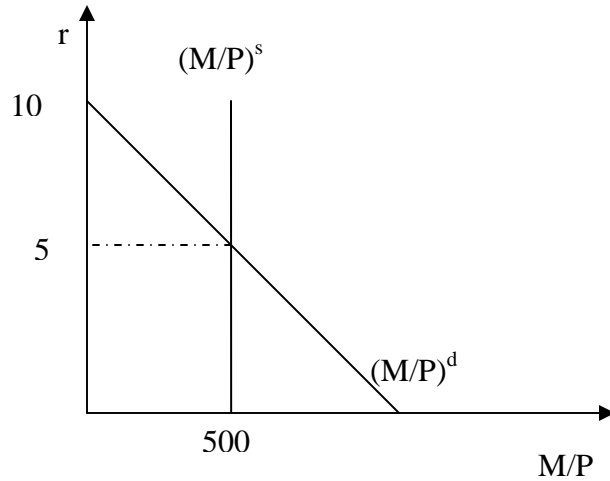
In the classical model of Chapter 3, the paradox of thrift does not arise. In that model, output is fixed by the factors of production and the production technology, and the interest rate adjusts to equilibrate saving and investment, where investment depends on the interest rate. An increase in thriftiness decreases consumption and increases saving for any level of output; since output is fixed, the saving schedule shifts to the right. At the new equilibrium, the interest rate is lower, and investment and savings are higher.

- 5) Suppose that the money demand function is

$$(M/P)^d = 1,000 - 100r,$$

where r is the interest rate in percent. The money supply M is 1,000 and the price level P is 2.

- a. Graph the supply and demand for real money balances.



The downward sloping line represents the money demand function, which is $1000 - 100r$. With $M = 1000$ and $P = 2$, the real money supply is 500. The real money supply is independent of the interest rate and is, therefore, represented by the vertical line.

- b. What is the equilibrium interest rate?

Set the supply and demand for real balances equal to each other:

$$500 = 1000 - 100r$$

$$r = 5, \text{ so the real interest rate is } 5\%$$

- c. Assume that the price level is fixed. What happens to the equilibrium interest rate if the supply of money is raised from 1,000 to 1,200?

With an increase in money supply from 1000 to 12000, the new supply of real balances is 600. We can solve for the new equilibrium by once again setting demand equal to supply:

$$600 = 1000 - 100r$$

$$r = 4.$$

- d. If the Fed wishes to raise the interest rate to 7 percent, what money should it set?

In equilibrium, $M/P = 1000 - 100r$. Setting the price level at 2 and substituting $r = 7$, we find:

$$\begin{aligned}M/2 &= 1000 - 100 \cdot 7 \\M &= 600.\end{aligned}$$

Thus the Fed must reduce the nominal money supply from 1000 to 600.

- 6) **a.** Suppose that there is a sudden increase in the demand for money – that is, at the same levels of r and Y people want to hold more money. What would happen to the money demand curve and the LM curve? Illustrate graphically.

The money demand curve will shift to the right, but the LM curve will shift to the left. It is not asked, but you should understand why – if people suddenly want more money, they are willing to pay a higher opportunity cost of holding that money (and this opportunity cost is given by r) for every level of Y , and this means a leftward shift of the LM curve.

- b.** Suppose that Congress decides to reduce the budget deficit by cutting government spending. What would happen to the Keynesian Cross and the IS curve? Illustrate graphically.

The Keynesian cross would shift down, resulting in less output. The IS curve will shift left, resulting in less output and lower interest rates. It is not asked, but you should understand why the loss in output in the IS-LM graph is actually LESS than the loss in output from the Keynesian cross (through the money market, less output results in lower interest rates. This in turn affects the goods market by making raising investment, thus offsetting some of the loss.

- 7) How would each of the following changes affect the shape of the IS curve?

- a.** the MPC gets bigger.

***It flattens it.** The Keynesian cross itself gets steeper, with makes changes in Investment (through changes in the interest rate) affect output more dramatically (specifically, as investment rises, the increase in output is this rise times $1/(1-MPC)$). Thus the IS curve suggests that changes in the interest will dramatically affect output.*

- b.** investment becomes more sensitive to changes in the interest rate.

It also flattens it.