

## Problem Sets 9

### 1. The opportunity cost of holding money

Suppose you've just inherited \$5,000 from a relative. You're trying to decide whether to put the \$5,000 in a non-interest-bearing account so that you can use it whenever you want (that is, hold it as money) or to use it to buy a U.S. Treasury bond. The opportunity cost of holding the inheritance as money depends on the interest rate on the bond. For each of the interest rates in the following table, compute the opportunity cost of holding the \$5,000 as money.

<b>Interest Rate on Government Bond</b> <i>(Percent)</i>	<b>Opportunity Cost</b> <i>(Dollars per year)</i>
9	
11	

What does the previous analysis suggest about the market for money?

- A. The supply of money is independent of the interest rate.
- B. The quantity of money demanded increases as the interest rate rises.
- C. The quantity of money demanded decreases as the interest rate rises.

### 2. The theory of liquidity preference and the downward-sloping aggregate demand curve

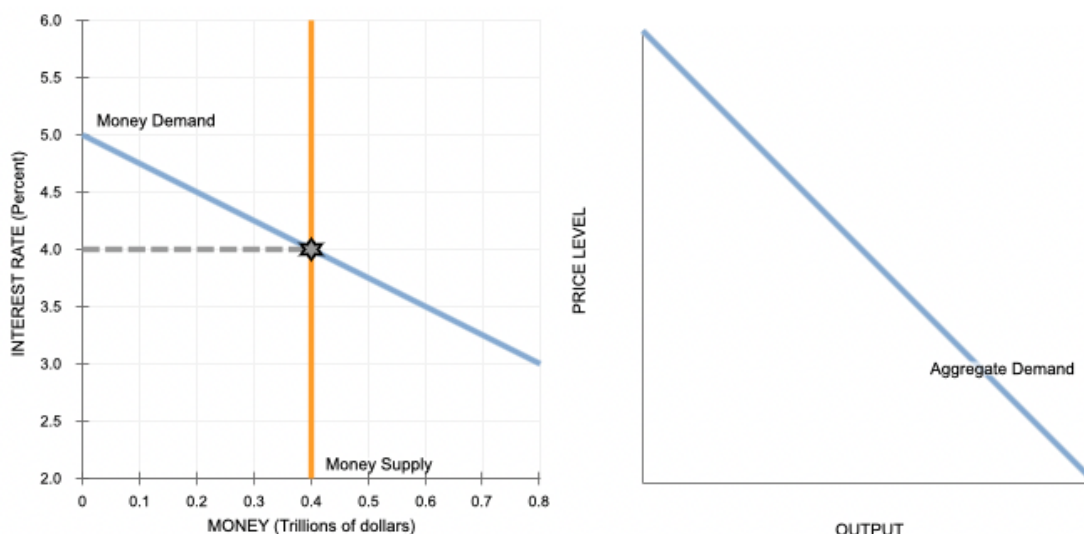
1) Suppose the money market for some hypothetical economy is given by the MD-MS model, which plots the money demand and money supply curves. Assume the central bank in this economy (the Fed) fixes the quantity of money supplied. Suppose the price level increases from 90 to 105. Shift the appropriate curve on the graph to show the impact of an increase in the overall price level on the market for money.

2) Following the price level increase, the quantity of money demanded at the initial interest rate of 6% will be \_\_\_\_\_ than the quantity of money supplied by the Fed at this interest rate. As a result, individuals will attempt to \_\_\_\_\_ their money holdings. In order to do so, they will \_\_\_\_\_ bonds and other interest-bearing assets, and bond issuers will realize that they \_\_\_\_\_ interest rates until equilibrium is restored in the money market at an interest rate of \_\_\_\_\_.

3) The AD graph plots the aggregate demand curve for this economy. Show the impact of the increase in the price level by moving the point along the curve or shifting the curve. The change in the interest rate found in the previous task will lead to a \_\_\_\_\_ in residential and business spending, which will cause \_\_\_\_\_ in the quantity of output demanded in the economy.

### 3. Changes in the money supply

The following graph represents the money market for some hypothetical economy. This economy is similar to the United States in the sense that it has a central bank called the Fed, but a major difference is that this economy is closed (and therefore does not have any interaction with other world economies). The money market is currently in equilibrium at an interest rate of 4% and a quantity of money equal to \$0.4 trillion, designated on the graph by the grey star symbol.



Suppose the Fed announces that it is lowering its target interest rate by 75 basis points, or 0.75 percentage points. To do this, the Fed will use open-market operations to \_\_\_\_\_ the \_\_\_\_\_ money by \_\_\_\_\_ the public. Use a new line on the left graph to illustrate the effects of this policy by placing the new money supply curve (MS) in the correct location. Place the black point (plus symbol) at the new equilibrium interest rate and quantity of money.

Suppose the right graph shows the aggregate demand curve for this economy. The Fed's policy of targeting a lower interest rate will \_\_\_\_\_ the cost of borrowing, causing residential and business investment spending to \_\_\_\_\_ and the quantity of output demanded to \_\_\_\_\_ at each price level. Shift the curve on the graph to show the general impact of the Fed's new interest rate target on aggregate demand.

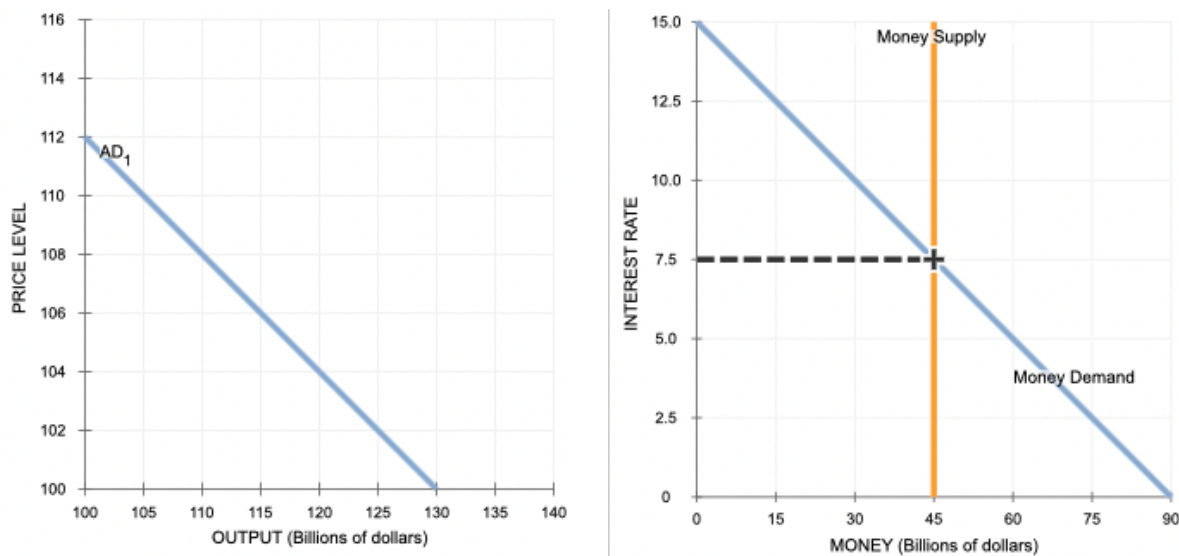
### 4. Changes in taxes

Using a graph that plots an aggregate demand curve, shift the aggregate demand curve to depict the impact that a tax hike has on the economy. Suppose the governments of two very similar economies, economy Y and economy Z, implement a permanent tax cut of equal size. Investment spending in economy Y is more sensitive to changes in the interest rate than investment spending in economy Z. The economies are otherwise completely identical. The tax cut will have a larger impact on aggregate demand in the economy with the \_\_\_\_\_.

## 5. Fiscal policy, the money market, and aggregate demand [Extra Credit: 1 point]

Suppose there is some hypothetical economy in which households spend \$0.50 of each additional dollar they earn and save the \$0.50 they have left over (marginal propensity to consume MPC). The following graph plots the economy's initial aggregate demand curve (AD<sub>1</sub>).

Suppose now that the government increases its purchases by \$5 billion and the government spending multiplier is  $1/(1-MPC)$ . Use a new line on the following graph to show the aggregate demand curve (AD<sub>2</sub>) after the multiplier effect takes place. **Hint:** Be sure the new aggregate demand curve (AD<sub>2</sub>) is parallel to AD<sub>1</sub>. You can see the slope of AD<sub>1</sub> by selecting it on the following graph.



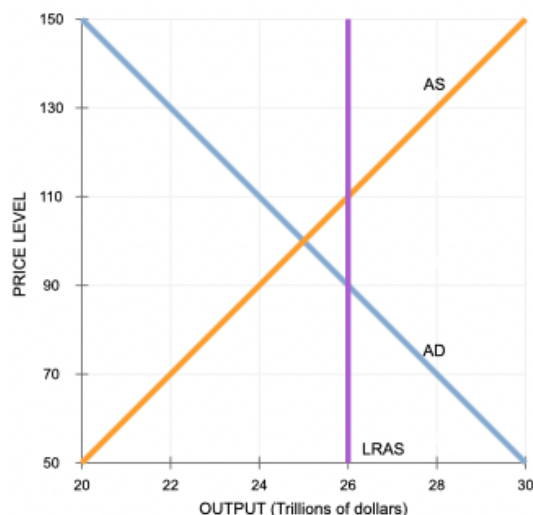
The graph above plots equilibrium in the money market at an interest rate of 7.5% and a quantity of money equal to \$45 billion. Show the impact of the increase in government purchases on the interest rate by shifting one or both of the curves on the following graph.

- 1) Suppose that for every increase in the interest rate of one percentage point, the level of investment spending declines by \$0.5 billion. Based on the changes made to the money market in the previous scenario, the new interest rate causes the level of investment spending to \_\_\_\_\_ by \_\_\_\_\_.
- 2) Taking the multiplier effect into account, the change in investment spending will cause the quantity of output demanded to \_\_\_\_\_ by \_\_\_\_\_ at every price level. The impact of an increase in government purchases on the interest rate and the level of investment spending is known as the \_\_\_\_\_ effect.
- 3) Use another new line on the graph at the beginning of this problem to show the aggregate demand curve (AD<sub>3</sub>) after accounting for the impact of the increase in government purchases on the interest rate and the level of investment spending. **Hint:** Be sure your final aggregate demand curve (AD<sub>3</sub>) is parallel to AD<sub>1</sub> and AD<sub>2</sub>. You can see the slopes of AD<sub>1</sub> and AD<sub>2</sub> by selecting them on the graph.

## 6. Use of discretionary policy to stabilize the economy

Should the government use monetary and fiscal policy in an effort to stabilize the economy? The following questions address the issue of how monetary and fiscal policies affect the economy, as well as the pros and cons of using these tools to combat economic fluctuations. The following graph plots hypothetical aggregate demand (AD), short-run aggregate supply (AS), and long-run aggregate supply (LRAS) curves for the U.S. economy in February 2026.

- 1) Suppose the government chooses to intervene in order to return the economy to the natural level of output by using \_\_\_\_\_ policy.
- 2) Depending on which curve is affected by the government policy, shift either the AS curve or the AD curve to reflect the change that would successfully restore the natural level of output.



- 3) Suppose that in February 2026 the government successfully carries out the type of policy necessary to restore the natural level of output described in the previous question. In July 2026, U.S. imports decrease because the United States has implemented trade restrictions on Mexican goods. Due to the \_\_\_\_\_ associated with implementing monetary and fiscal policy, the impact of the government's new policy will likely \_\_\_\_\_ once the effects of the policy are fully realized.