Chapter 15: Monetary Policy

Money Supply and Demand

The *money demand curve* shows the relationship between the interest rate and the quantity of money demanded.

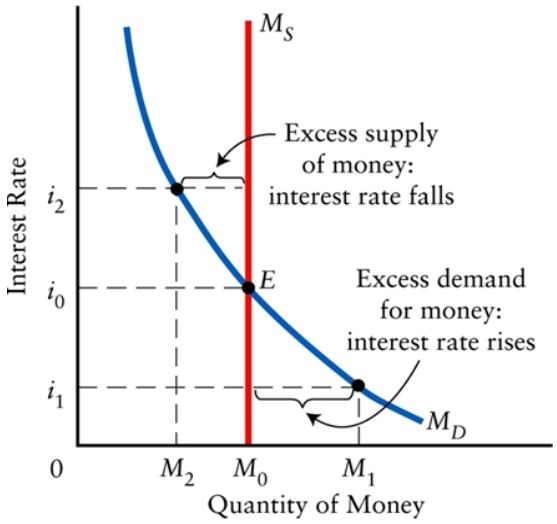
Why is the money demand curve downward sloping?

- Opportunity cost of holding money is the nominal interest rate
- ↑ nominal interest rate => ↑ opportunity cost of money => ↓ demand for money

Shifts of Money Demand Curve:

- **Changes in Aggregate Price Level:**
  ↑ prices => ↑ money needed to but goods and services => ↑ money demand
- **Changes in Real GDP**
  ↑ GDP => ↑ quantity of goods and services bought => ↑ money demand
- **Changes in Credit Market and Banking Technology**
  New technology (credit cards/debit cards) allow buying of goods and services without money and access to interest-bearing accounts at lower cost => ↓ money demand
- **Changes in Institutions**
  Elimination of Regulation Q allowed interest payments on checking => ↑ money demand

The *money supply curve* shows the amount of currency supplied by the Fed



The Federal Reserve is able to increase or decrease the money supply in order to affect the interest rate and stabilize the economy. This is referred to as *monetary policy*. There are three ways the Fed can affect the money supply:

1. **Changing reserve requirements**: banks are required to keep a percentage of their deposits on hand at all times as *reserves*. This percent is given by the *reserve ratio*. By decreasing the reserve

ratio, banks can lend more money, increasing the amount of currency in circulation leading to the creation of more checking deposits and thus a higher money supply. This also works in reverse. This process can be described mathematically by the money multiplier:

$$Money\ Multiplier = \frac{1}{RR}$$

$$\Delta Checking\ Deposits = Money\ Multiplier \times Initial\ Deposit$$

$$\Delta Money\ Supply = Money\ Multiplier \times Initial\ Deposit - Initial\ Deposit$$

2. **Changing the Discount Rate**: one of the key roles of the Fed is to act as the *lender of last resort*. When banks are in desperate need of currency, they can borrow funds from the Fed. The interest rate charged on these loans is the *discount rate*. By decreasing this number, the Fed can encourage banks to lend more money, which in turn increases the money supply as prescribed by the money multiplier.

3. **Open Market Operations:** This is the most commonly used form of monetary policy. In an *open-market operation*, the Fed buys or sells US Treasury Bills (T-Bills) to commercial banks in exchange for money. In an *open market sale*, the Fed sells T-Bills to the banks in exchange for currency, decreasing the money supply. In an *open market purchase*, the Fed buys T-Bills from the banks in exchange for currency, increasing the money supply. The new funds can be lent out, which further increases (or decreases in the case of a sale) the money supply via the money multiplier.

Much like fiscal policy, monetary policy can be either expansionary or contractionary:

- **Expansionary Monetary Policy:** Monetary policy that increases aggregate demand

↑ money supply => ↓ interest rate => ↑ I => ↑ C (via multiplier)
=> ↑ aggregate demand (AD curve shifts right)

- **Contractionary Monetary Policy:** Monetary policy that decreases aggregate demand

↓ money supply => ↑ interest rate => ↓ I => ↓ C (via multiplier)
=> ↓ aggregate demand (AD curve shifts right)

Money and Interest Rates

Liquidity Preference Model of the Interest Rate: The interest rate is determined by the supply and demand for money

Target Federal Funds Rate: The Federal Reserve's desired federal funds rate

Taylor Rule for Monetary Policy: A rule that sets the federal funds rate according to the level of the rate and either the output gap or the unemployment rate. An example is shown below

$$\text{Federal Funds Rate} = 2.07 + 1.28 \times \text{inflation rate} - 1.95 \times \text{unemployment rate}$$

Inflation Targeting: When the central bank sets an explicit target for the inflation rate and sets monetary policy in order to hit that target

Zero Lower Bound for Interest Rates: Interest rates cannot fall below zero

I. Money, Output and Prices in the Long Run

- **Monetary Neutrality:** Changes in the money supply have no real effects on the economy in the long run.
  - An increase in the money supply simply increases the price level.

II. Practice Questions

1. If a checking account pays no interest and a Treasury bill pays 1% interest, then the opportunity cost of holding money in checking is
   a) 0%
   b) 1%
   c) 2%
   d) there is never an opportunity cost of holding money in checking

2. An increase in government purchases causes GDP to increase, then the
   a) money supply decreases.
   b) money supply increases.
   c) money demand decreases.
   d) money demand increases.

3. If the equilibrium interest rate in the money market is 2%, then at an interest rate of 5%
   a) money demanded exceeds the money supplied, and people shift from holding money to interest bearing assets, causing the interest rate to fall.
   b) money supplied exceeds the money demanded, and people shift from holding money to interest bearing assets, causing the interest rate to fall.
   c) money demanded exceeds the money supplied and people shift from holding interest bearing assets to money, causing the interest rate to rise.
   d) money supplied exceeds the money demanded and people shift from holding interest bearing assets to money, causing the interest rate to rise.

4. An increase in the required reserve ratio will _____ the money supply, causing interest rates to _____.
   a) decrease; decrease
   b) decrease; increase
   c) increase; decrease
   d) increase; increase

5. Monetary policy affects the price level and GDP by
   a) changing imports.
   b) changing government purchases.
   c) changing aggregate demand.
   d) changing the amount of labor supplied.

6. When the Federal Reserve wants to increase the federal funds rate,
   a) it buys treasury bills from banks, increasing bank reserves and increasing the money supply.
   b) it buys treasury bills from banks, decreasing bank reserves and decreasing the money supply.
   c) it sells treasury bills to banks, increasing bank reserves and increasing the money supply.
   d) it sells treasury bills to banks, decreasing bank reserves and decreasing the money supply.

7. In the short run, according to the loanable funds model, contractionary monetary policy
   a) decreases the demand for loanable funds.
   b) has no effect on the supply of loanable funds.
   c) decreases the supply of loanable funds.
   d) has no effect on the quantity of loanable funds demanded.

8. When there is a recessionary gap, the Federal Reserve can _____ interest rates to _____ GDP and _____ the price level.
   a) increase; increase; increase
   b) increase; decrease; increase
   c) decrease; increase; increase
   d) decrease; decrease; increase

9. Suppose expansionary fiscal policy causes inflation to rise above the Federal Reserve's inflation target. Then the Federal Reserve will _____ interest rates in order to _____ inflation.
   a) decrease; decrease
   b) decrease; increase
   c) increase; decrease
   d) increase; increase

10. Suppose that the Federal Reserve follows a Taylor rule for monetary policy. When inflation increases, the Federal Reserve will want to _____ the interest rate. So it will _____ banks, causing the money supply to _____.
    a) decrease; sell Treasury bills to; increase
    b) decrease; buy treasury bills from; increase
    c) increase; sell Treasury bills to; decrease
    d) increase; buy Treasury bills from; decrease

11. Consider an economy that is in its long-run equilibrium right now. If the Federal Reserve increases the money supply, then in the long run GDP will be _____ now and the price level will be _____ now.
    a) the same as; the same as
    b) lower than; higher than
    c) higher than; the same as
    d) the same as; higher than

12. Suppose the Federal Reserve increases the money supply by buying Treasury bills from banks. Then
    a) in the short run interest rates decrease, and in the long run interest rates stay low
    b) in the short run interest rates increase, and in the long run interest rates decrease
    c) in the short run interest rates decrease, and in the long run interest rates return to where they started
    d) in the short run interest rate stay the same, and in the long run interest rates decrease

13. Suppose the economy is in long run equilibrium. If the Fed engages in expansionary monetary policy:
    a) In the long run GDP increases and the price level increases
    b) In the long run GDP increases and the price level does not change
    c) In the long run neither GDP nor the price level changes
    d) In the long run GDP does not change and the price level increases

14. Suppose there is an inflationary gap in the economy. To address this the Fed can:
    a) Engage in an open market sale
    b) Engage in an open market purchase
    c) Both a and b
    d) The Fed cannot close an inflationary gap using monetary policy

15. If the interest rate increases:
    a) There is an increase in the quantity of money supplied
    b) There is a decrease in the quantity of money supplied
    c) There is no change in the quantity of money supplied
    d) Not enough information