The Money Market and the Interest Rate

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An individual’s quantity of money demanded is the amount of wealth that the individual chooses to hold as money, rather than as other assets.
When you hold money, you bear an opportunity cost - the interest you could have earned.
Individuals’ Demand for Money

Simplifying Assumption:

Individuals choose how to divide wealth between two assets:

- **money**, which can be used as a means of payment but earns no interest, and
- **bonds**, which earn interest but cannot be used as a means of payment.
Individuals’ Demand for Money

How much money an individual will decide to hold is determined by:

• The Price Level
• Real Income
• The Interest Rate
The Money Demand Curve

Money Demand Curve

A curve indicating how much money will be willingly held at each interest rate
The money demand curve is drawn for a given real GDP and a given price level. At an interest rate of 6 percent, $500 billion of money is demanded. If the interest rate drops to 3 percent, the quantity of money demanded increases to $800 billion.
A change in the interest rate moves us along the money demand curve.

A change in money demand caused by something other than the interest rate (such as real income or the price level) will cause the curve to shift.
Shifts in the Money Demand Curve

An increase in real GDP or in the price level will shift the money demand curve rightward.

At any interest rate, more money will be demanded after the shift.
The Supply of Money

Money Supply Curve

A line showing the total quantity of money in the economy at each interest rate

The money supply is determined by the Federal Reserve
The Supply of Money

<table>
<thead>
<tr>
<th>Interest Rate</th>
<th>Money Supply ($ Billions)</th>
</tr>
</thead>
<tbody>
<tr>
<td>6%</td>
<td>$500</td>
</tr>
<tr>
<td>3%</td>
<td>$700</td>
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</tbody>
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Diagram showing the supply of money with interest rates and money supply levels.
Equilibrium in the Money Market

Occurs when the quantity of money people are actually holding (quantity supplied) is equal to the quantity of money they want to hold (quantity demanded)
Money Market Equilibrium

<table>
<thead>
<tr>
<th>Interest Rate</th>
<th>Money Market Equilibrium</th>
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</thead>
<tbody>
<tr>
<td>9%</td>
<td>500</td>
</tr>
<tr>
<td>6%</td>
<td>300</td>
</tr>
<tr>
<td>3%</td>
<td>800</td>
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</tbody>
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Money ($ Billions)

Diagram:
- S: Supply of money
- D: Demand for money
- E: Equilibrium point
How the Money Market Reaches Equilibrium

**Excess Supply of Money**
The amount of money supplied exceeds the amount demanded at a particular interest rate.

**Excess Demand for Bonds**
The amount of bonds demanded exceeds the amount supplied at a particular interest rate.
How the Money Market Reaches Equilibrium

When there is an excess supply of money in the economy, there is also an excess demand for bonds.
How the Money Market Reaches Equilibrium

Interest rate higher than equilibrium

Excess supply of money

Excess demand for bonds

Public tries to buy bonds

Prices of bonds go up
Bond Prices and Interest Rates

When the price of bonds rises, the interest rate falls.
When the price of bonds falls, the interest rate rises.

Example of the price of a perpetual stream of $c

Price = \( \frac{c}{i} \)

where \( i \) is the rate of interest.

Example \( c=5, \ i=.1, \ Price = 50 \)

Example \( c = 5, \ i=.05, \ Price = 100 \)

Example \( c=5, \ i=.2, \ Price = 25 \)
Changes in the Interest Rate

• What causes the equilibrium interest rate to change?
• What are the consequences of a change in the interest rate?
At point E, the money market is in equilibrium at an interest rate of 6 percent.

To lower the interest rate, the Fed could increase the money supply to $800 billion.

The excess supply of money (and excess demand for bonds) would cause bond prices to rise, and the interest rate to fall, until a new equilibrium is established at point F with an interest rate of 3 percent.
How the Money Market Reaches Equilibrium

Fed conducts open market purchases → Money supply increases → Excess supply of money and excess demand for bonds → Public tries to buy bonds

Interest rate goes down → Price of bonds goes up
How the Fed Changes the Interest Rate

• If the Fed increases the money supply by buying government bonds, the interest rate falls.
• If the Fed decreases the money supply by selling government bonds, the interest rate rises.
• By controlling the money supply through purchases and sales of bonds, the Fed can also control the interest rate.
The Fed in Action

Federal Funds Rate

In practice there are many interest rates in modern economies. Interest rates vary with the borrower and the maturity of the loan (bond). The Federal Funds Rate is the interest rate charged for loans of reserves among banks. This is the interest rate that the Fed chooses to control when conducting monetary policy.
During 2001, the Fed repeatedly increased the money supply, which caused the interest rate to drop.