The Money Market

The quantity of money (e.g., M1) is determined by the Federal Reserve (the Fed) through its control of the reserve requirement and money creation by the banking system. The price of money is the interest rate. The interest rate is the price of money because it is what borrowers must pay to obtain money and it is also the opportunity cost of holding money rather than loaning it out.

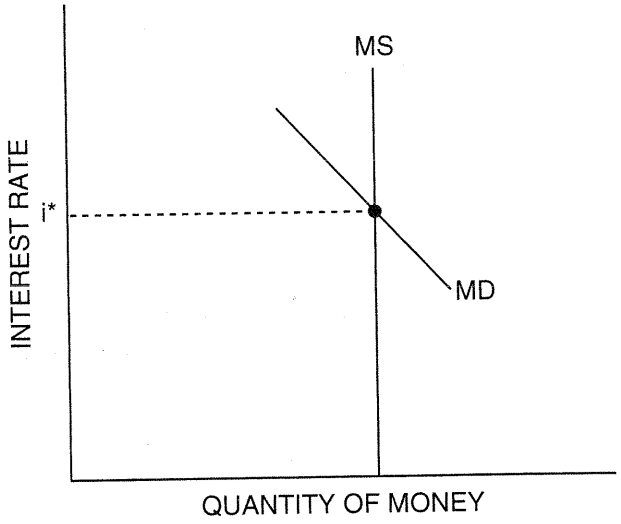
The money market consists of the demand for money (MD) and the supply of money (MS). The Fed determines the quantity of money supplied. Since it is determined by the Fed, the money supply is independent of the interest rate, and the money supply curve is a vertical line.

The demand for money is based on a decision by consumers to hold wealth in the form of interest-bearing assets (e.g. savings accounts) or as money (noninterest-bearing). There are three types of money demand, based on the three basic motives people have for holding money (rather than interest-bearing assets).

- Transactions demand — to make purchases of goods and services
- Precautionary demand — to serve as protection against an unexpected need
- Speculative demand — to serve as a store of wealth

The demand for money is a function of interest rates and income. The interest rate is the opportunity cost of holding money because it represents the forgone interest income that was given up in order to hold money. The demand for money has an inverse relationship with the interest rate. As the interest rate increases, the opportunity cost of holding money increases and people hold less money. As the interest rate falls, the opportunity cost of holding money falls and people hold more money. The negatively sloped demand curve for money represents the quantity of money demanded at various interest rates.

Figure 4-4.1
The Money Market



Student Alert: Make sure you read any money multiplier questions carefully to determine exactly which value the question asks for. For example, does it ask you to calculate the initial change or the final change?

4. Assume that $1,000 is deposited in the bank, and that each bank loans out all of its excess reserves. For each of the following required reserve ratios, calculate the amount that the bank must hold in required reserves, the amount that will be excess reserves, the deposit expansion multiplier, and the maximum amount that the money supply could increase.

	Required reserve ratio		
	1%	5%	10%
Required reserves	***$10***	***$50***	***$100***
Excess reserves	***$990***	***$950***	***$900***
Deposit expansion multiplier	***100***	***20***	***10***
Maximum increase in the money supply	***$99,000***	***$19,000***	***$9,000***

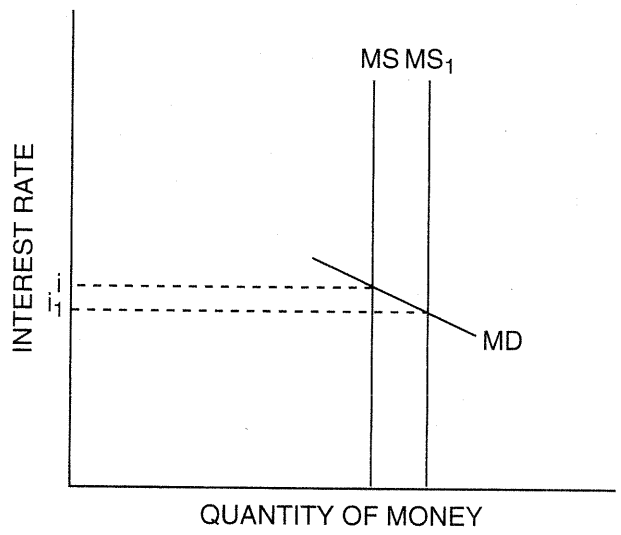
(A) Will an increase in the reserve requirement increase or decrease the money supply? Explain.
The money supply will be decreased. Banks must hold more of their deposits as reserves so loans and money creation are decreased.

(B) What will happen to deposits, required reserves, excess reserves, and the money supply if deposits are withdrawn from the banking system?
Deposits decrease; required reserves decrease; excess reserves decrease, and the money supply decreases.

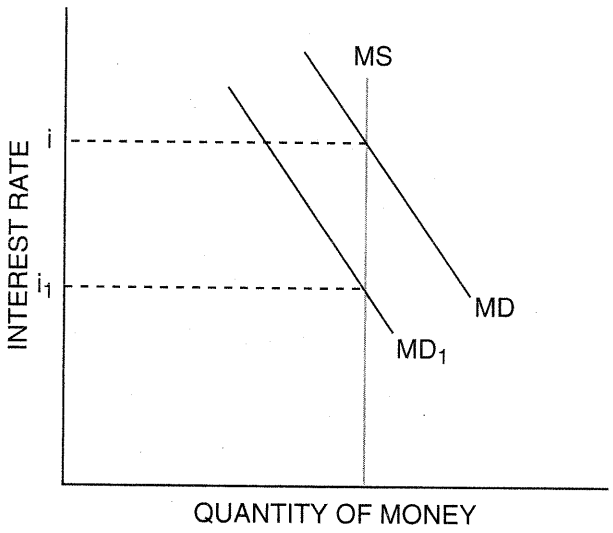
(C) What could happen at each stage of the money creation process to prevent the money supply from increasing the full amount predicted by the deposit expansion multiplier?
People could hold their loan proceeds as cash; banks could hold excess reserves.

1. Now suppose there is an increase in the money supply. Show the change in the money supply and the resulting change in the equilibrium interest rate on Figure 4-4.1 What happens to the quantity of money demanded when the interest rate changes? What happens to the quantity of loans as the interest rate changes? Explain.
   The quantity of money demanded increases as the interest rate falls. The quantity of loans increases. This is because the interest rate is the price of loans and the opportunity cost of holding money.

2. Now draw a new graph of the money market, illustrating the equilibrium interest rate.



3. Suppose the demand for money increases. Show the change in money demand and the resulting interest rate on your graph. What happens to the quantity of loans as the interest rate changes? Explain.

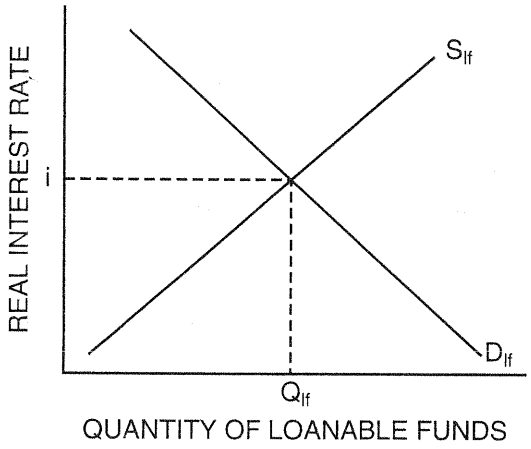


The quantity of loans decreases because the interest rate (the price of loans) has increased.

The Loanable Funds Market

The loanable funds market is made up of borrowers, who demand funds (D_{lf}), and lenders, who supply funds (S_{lf}). The loanable funds market determines the real interest rate (the price of loans), as shown in Figure 4-5.1.

Figure 4-5.1
Market for Loanable Funds



Four groups demand and supply loanable funds: consumers, the government, foreigners, and businesses. The same four groups demand and supply loanable funds, so it is important to understand the economic behavior depicted by the demand and supply curves for loanable funds.

The demand curve for loanable funds is negatively sloped. More loans are demanded at lower real interest rates, and fewer loans are demanded when real interest rates are higher. Businesses, for example, will find more projects worthwhile to invest in at lower rates than at higher rates. Profits rise as interest rates fall. Businesses will therefore borrow more at lower rates to finance the increased business investment spending. Consumer and foreigner borrowing is also sensitive to changes in the interest rate. Consider that the monthly payments for a mortgage are higher with a higher real interest rate. As the rate rises, fewer consumers can afford the higher mortgage payments. Government borrowing is not very sensitive to the interest rate.

The upward slope of the supply of the loanable funds demonstrates the willingness of households to save. The opportunity cost of saving is spending now. The more income saved, the less can be spent now. The opportunity cost rises as more and more income is saved. Thus higher rates of interest are needed to compensate for the increasing opportunity cost of saving.

The equilibrium real interest rate is the rate at which the total amount savers are willing to lend equals the total amount borrowers are willing to borrow. The major determinants of the demand for loanable funds are business confidence and expectations, consumer confidence and expectations, government budget plans, and income levels.

For example, if businesses are confident of future profits, they will want to borrow more at all possible real interest rates to expand operations, and the D_{lf} curve shifts to the right. If the government decreases spending to reduce the deficit it decreases the need to borrow, and the D_{lf} curve shifts to the left. If consumers become concerned that the economy is heading toward a recession, they will become concerned about their ability to repay loans and will cut back on their borrowing, decreasing the demand for loanable funds. On the other hand, rising incomes would cause consumers to borrow more since their higher incomes enable them to pay back higher amounts.

On the supply side, if the government reduces the income tax rate on interest income, consumers will want to save more at every real interest rate, and the S_{lf} curve will shift to the right. Anything that causes consumers to save more will shift the S_{lf} curve to the right. The Federal Reserve plays a significant role on the supply side of the loanable funds market.

A good way to view the loanable funds market is to consider the bond market with an understanding that bonds are fixed-rate loans. Thus, anyone who buys a newly issued bond is loaning funds to the seller of the bond. The demand for loanable funds then is the same as the supply of bonds in the bond market, and the supply of loanable funds is the same as the demand for bonds in the bond market. Considering these relationships helps to understand that bond prices and interest rates are inversely related. For example, an increase in demand for loanable funds (increase in supply of bonds) raises interest rates in the loanable funds market (and decreases bond prices in the bond market).

Student Alert: **Make sure you understand the differences (and similarities) between the money market and the loanable funds market and use the appropriate one! The slope of the supply curve is a key distinction!**

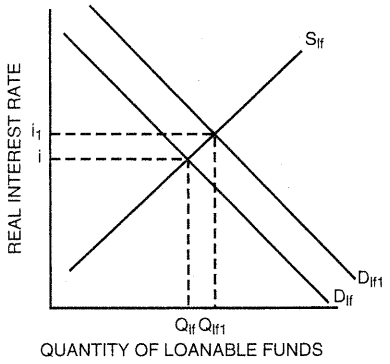
1. Explain why the demand for loanable funds is negatively sloped. (Use the business borrower in your explanation.)
   Since the present value of future projected profits will increase at lower interest rates, businesses will borrow more at lower interest rates to finance the increased number of worthwhile projects.

2. Explain why the supply of loanable funds is positively sloped. (Use household savers in your explanation.)
   The opportunity cost of savings, spending, increases as more and more spending is foregone.

3. Is the interest rate in the loanable funds market nominal or real? Explain.
   Real interest rate since lenders and borrowers respond to real rates as opposed to nominal rates.

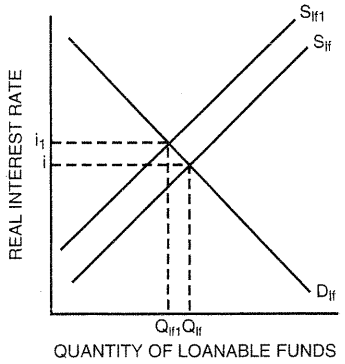
4. Draw a graph of the loanable funds market showing the effect of each of the following on the real interest rate and quantity of loanable funds.

(A) The government increases spending *ceteris paribus*.



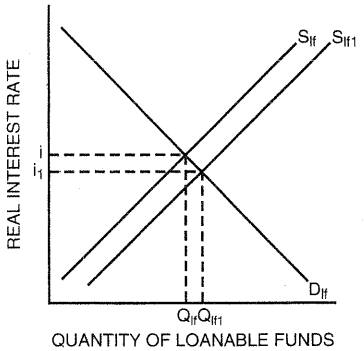
The government will need to borrow more to finance the increased spending. The demand for loanable funds will shift to the right causing the real rate to increase.

(B) The government increases tax on income from interest payments.



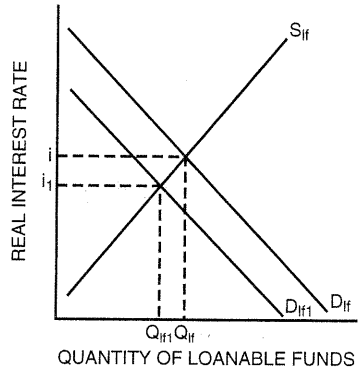
Higher taxes on interest income will cause savers to save less at all real interest rates. Thus, the supply of loanable funds will shift left causing the real rate to increase.

(C) The Federal Reserve buys bonds on the open market facilitating an increase of the money supply.



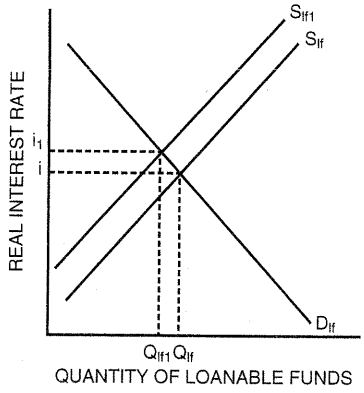
As banks with new reserves increase the amount of loans, the supply of loanable funds will increase, causing the real rate to decrease.

(D) The University of Michigan releases the index of consumer and business confidence, which indicates both are lower.



Both consumers and businesses will not feel confidant to take out more loans which will decrease the demand for loanable funds causing the real rate to decrease.

(E) Consumers in China decide to increase consumption.



If Chinese consumers spend more, they save less. Since some of Chinese savings is in the United States, the supply of loanable funds in the United States will shift to the left (decrease) causing the real rate to increase.