

LECTURE NOTES ON MACROECONOMIC PRINCIPLES

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Ch 26 Saving, Investment, and the Financial System

Introduction

When a country saves a large fraction of its income, more resources are available for investment in capital, and higher capital raises the economy's productivity, raising living standards still further.

But within that country, at any given point in time, some people will want to save some of their income for the future, while others will want to borrow to finance investments in physical capital.

How are savers and investors coordinated?

The **financial system** consists of those institutions in the economy that help to match one period's savings with another person's investment.

This chapter:

1. Describes the variety of institutions that make up the financial system in the US today.
2. Describes the relationship between the financial system and these key macroeconomic variables: saving and investment.
3. Develops a model that describes how the interest rate adjusts so as to equate the demand for and supply of funds in the financial system and uses this model to show how various government policies affect the interest rate, saving, and investment.

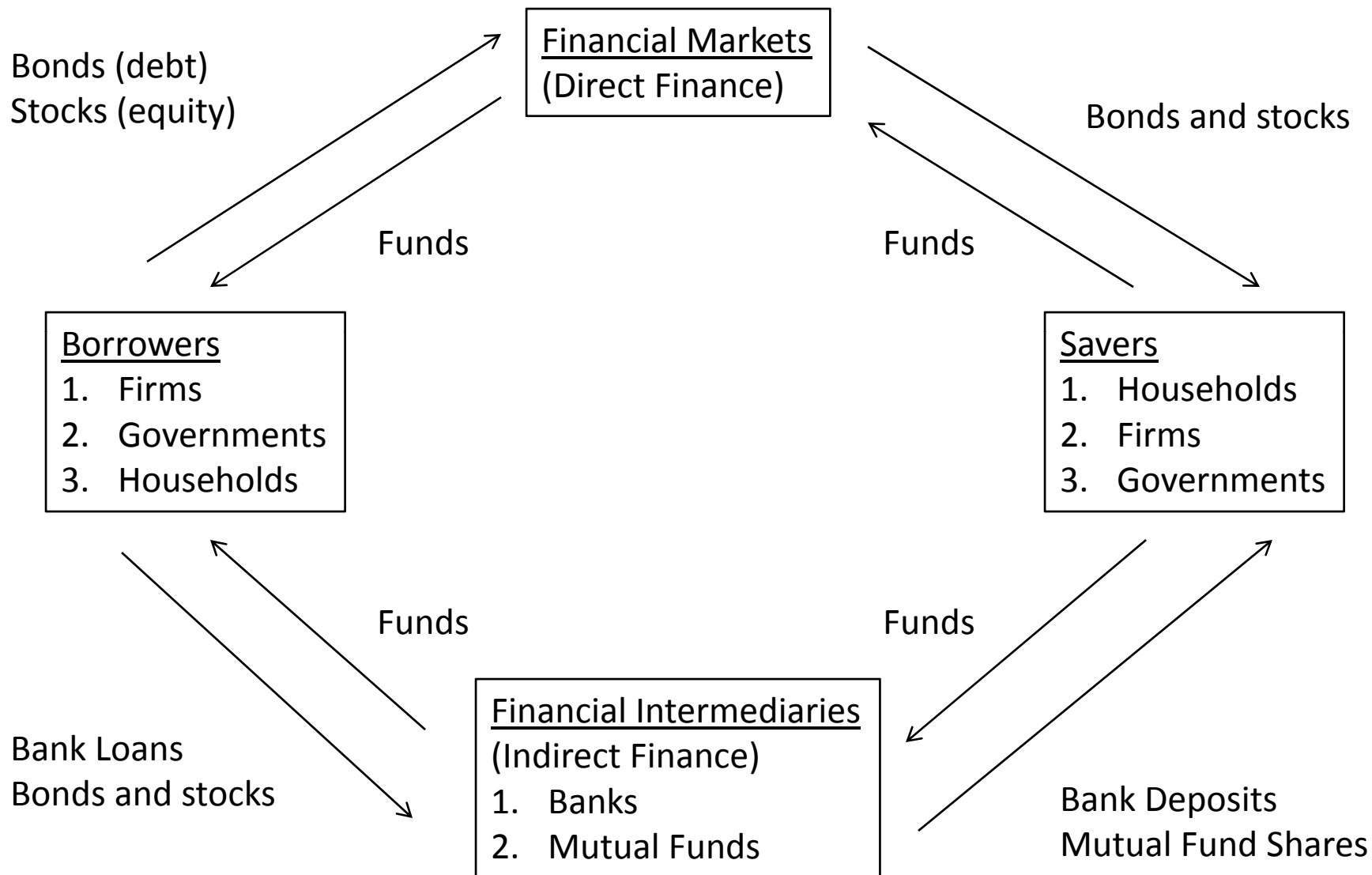
Outline

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Financial Institutions in the US Economy

Savers spend less than they earn.

Financial Institutions in the US Economy



Borrowers spend more than they earn.

The financial system moves funds from savers to borrowers.

Savers supply funds with the expectation that they will get those funds back with interest at a later date.

Borrowers demand funds with the expectation that they will have to repay those funds with interest at a later date.

Financial institutions include:

1. Financial markets.
2. Financial intermediaries.

Financial Markets

Financial markets are institutions through which savers supply funds *directly* to borrowers. Hence, borrowing and lending activity in financial markets is often referred to as **direct finance**.

The two most important financial markets in the US economy are:

1. The bond market.
2. The stock market.

The Bond Market

A **bond** is a certificate of indebtedness that specifies the obligations of the borrower to the holder of the bond.

A bond typically specifies:

1. The **date of maturity**, when the **principal** or amount borrowed is to be repaid.
2. The rate of interest that will be paid periodically until the date of maturity.

Example: General Motors issues a \$1000 bond with a maturity date of December 2028 and a 5% rate of interest. This bond will make annual interest payments of \$50 each year until the end 2028, when the final interest payment is made and the \$1000 returned.

Three characteristics of bonds:

1. The bond's **term** is the length of time until the bond matures. Some bonds have short terms of only a few months, other bonds have long terms of up to 30 years. Typically, longer term bond pay higher interest rates than shorter terms bonds, to compensate bond holders for having to wait longer to get their principal back.
2. The bond's **credit risk** refers to the probability that the borrower will be unable to make interest payments and/or repay principal. When this happens, the borrower is said to **default** by entering **bankruptcy**. Typically, low risk bonds like those issued by the US Government pay lower interest rates than higher risk bonds issued by corporations: borrowers receive a higher

interest rate to compensate them for taking on more risk. **Junk bonds**, issued by financially shaky corporations, pay the highest rates of interest.

3. Bonds also differ in the **tax treatment** of their interest payments. **Municipal bonds**, issued by state and local governments, pay interest that is exempt from the federal income tax. Because of this tax advantage, municipal bonds usually pay lower interest rates than bonds issued by private corporations or even the US Government.

The Stock Market

A **stock** is a certificate that represents a claim to partial ownership in a firm and hence a share of the profits that the firm makes. The firm pays out some of its profits as **dividends** to its stockholders.

Example: if a corporation issues 1,000,000 shares of stock, then each share represents a claim to 1/1,000,000 of the business.

From the borrower's point of view, the sale of stock to raise money is called **equity finance**, while the sale of bonds to raise money is called **debt finance**.

From the saver's point of view:

- The advantage to buying a bond is that it pays a fixed rate of interest and returns the principal for sure, except in the rare case of bankruptcy.
- The disadvantage to buying a bond is that its payments are fixed, even if the firm earns higher and higher profits.
- The advantage to buying a stock is that its dividends, and therefore its price, will rise when the firm earns higher profits.
- The disadvantage to buying a stock is that its dividends, and therefore its price, will fall when the firm earns lower profits.

Although the US bond market is actually much larger than the US stock market, stock prices get more attention. This is not surprising, in light of the consideration of bonds versus stocks from above, since stock prices are more closely linked to firm profitability and hence to the health of the US economy.

Stock indexes, or averages of stock prices, like the Dow Jones Industrial Average (an average of stock prices for 30 major US corporations) and the Standard & Poor's 500 (an average of stock prices for 500 large US corporations) are closely followed by economists and financial market participants.

Financial Intermediaries

Financial intermediaries are institutions through which savers supply funds *indirectly* to borrowers. Hence, borrowing and lending activity through financial intermediaries is often referred to as **indirect finance**.

Two of the most important financial intermediaries in the US economy are:

1. Banks.
2. Mutual funds.

Banks

Banks:

1. Accept **deposits** from savers.
2. Make **loans** to borrowers.

Banks cover their costs and make profits by charging a higher interest rate on their loans than they pay on their deposits.

Banks are also special, in that they allow savers to write checks on some types of deposits. That is, bank deposits serve as a *medium of exchange* as well as a *store of value*.

Mutual Funds

Mutual funds:

1. Sell shares to savers.
2. Use the proceeds to buy a collection or *portfolio* of stocks and/or bonds.

Why don't savers just buy the stocks and bonds themselves?

Mutual funds help with **diversification**: by investing in many stocks and bonds, a sharp decline in the price of any one stock or a default on any one bond becomes less important.

Mutual funds also allow savers to delegate stock and bond selection to a professional money manager.

Saving and Investment in the National Income Accounts

Recall that GDP can be broken down into four components: consumption, investment, government purchases, and net exports:

$$Y = C + I + G + NX$$

This equation is an *identity*: it always holds true, given how the variables are defined.

A *closed economy* is one that does not trade with the rest of the world. An *open economy* is one that does trade with the rest of the world.

For now, let's simplify the analysis by considering a closed economy in which, by assumption, $NX = 0$ and so

$$Y = C + I + G$$

Again, this equation is an identity: it just says that each unit of output is either consumed, invested, or purchased by the government.

Rearrange the equation as

$$Y - C - G = I$$

The amount on the left-hand side equals **national saving**, the amount of income that is not consumed by households or purchased by the government:

$$S = Y - C - G$$

Therefore, in a closed economy, saving must always equal investment:

$$S = I$$

Next, let T denote the amount of tax revenue the government receives, net of transfer payments (like Social Security) that it returns to households. Then the equation for national saving

$$S = Y - C - G$$

can be rewritten as

$$S = (Y - T - C) + (T - G)$$

Which divides national saving into two components:

$$\textit{Private Saving} = Y - T - C$$

$$\textit{Public Saving} = T - G$$

Private saving is the income that households have left after paying for taxes and consumption.

Public saving is the amount of tax revenue that the government has left after paying for its purchases:

- If $T - G > 0$, then the government is running a **budget surplus**, an excess of tax revenue over government spending.
- If $T - G < 0$, then the government is running a **budget deficit**, a shortfall of tax revenue compared to government spending.

Now suppose that:

- GDP equals \$15 billion.
- Consumption equals \$9 billion.
- Government purchases equal \$1.5 billion.
- Tax revenue equal \$1 billion.

Let's assume that we're in a closed economy, and find investment, national saving, private saving, and public saving.

To find investment:

$$Y = C + I + G$$

$$I = Y - C - G = \$15 - 9 - 1.5 = \$4.5 \textit{ billion}$$

To find saving:

$$S = I = Y - C - G = \$4.5 \text{ billion}$$

To find private saving:

$$\text{Private Saving} = Y - T - C = \$15 - \$1 - \$9 = \$5 \text{ billion}$$

To find public saving:

$$\text{Public Saving} = T - G = \$1 - 1.5 = -\$0.5 \text{ billion}$$

In this (unfortunately realistic) case, the government is running a budget deficit.

The Market for Loanable Funds

Something curious:

- In the first part of this chapter, we looked at how some people save by spending less than they earn and how others borrow by spending more than they earn. What's more, some borrowers use the proceeds to invest, that is, to purchase capital goods. So for any one individual, saving need not equal investment.
- In the second part of the chapter, however, we looked at how, for a closed economy as a whole, saving must always equal investment.
- How can we reconcile what is possible at the level of each individual with what must hold true for the economy as a whole?
- What mechanism coordinates individual decisions, so that saving always equals investment?

To answer these questions, we need to develop a model of what happens in the market for **loanable funds**, that is, the market in which individual savers supply funds and individual borrowers demand funds.

Supply and Demand for Loanable Funds

Like any other market, an analysis of the market for loanable funds revolves around supply and demand.

The **supply of loanable funds** comes from individuals who have saved and want to lend the funds out, either directly in the stock and bond markets or indirectly through a bank or mutual fund.

When the interest rate rises, saving becomes more attractive, so the supply of loanable funds goes up.

Hence, in Figure 1, the supply curve for loanable funds slopes up.

The **demand for loanable funds** comes from individuals who need funds and want to invest (to purchase a house, for example) and firms who need funds and want to invest (to purchase capital equipment, for example).

When the interest rate rises, borrowing becomes less attractive, so the demand for loanable funds goes down.

Hence, in Figure 1, the supply curve for loanable funds slopes down.

The economy's interest rate must adjust to balance the supply and demand for loanable funds. In Figure 1, this happens when the interest rate equals 5%.

What would happen if, instead, the interest rate was below its equilibrium level, say, at 3%? Then the demand for loanable funds would exceed the supply. That is, too many people would want to borrow. The resulting shortage of loanable funds would place upward pressure on the interest rate, encouraging saving and discouraging borrowing until the interest rate returns to 5%.

What would happen if the interest rate was above its equilibrium level, say at 7%? Then the supply of loanable funds would exceed the demand. That is, too many people would want to save. The resulting glut of loanable funds would place downward pressure on the interest rate, discouraging saving and encouraging borrowing until the interest rate returns to 5%.

In this way, the "invisible hand" of the market for loanable funds coordinates the decisions of individuals who want to save (and hence supply loanable funds) and individuals who want to invest (and hence demand loanable funds).

With the loanable funds framework in hand, we can consider the impact of various government policies on saving and investment by asking:

1. Does the policy shift the demand curve or the supply curve in the market for loanable funds?
2. Which way does the curve shift?
3. What happens to the equilibrium?

Policy 1: Saving Incentives

What happens if the government increases the amount of income that individuals can allocate to Individual Retirement Accounts and other tax advantaged accounts?

This policy would increase the after-tax interest return that individuals would receive on their saving.

1. It would therefore shift the supply curve for loanable funds.
2. Because savers would supply more loanable funds at any given interest rate, the supply curve would shift to the right.
3. Hence, as shown in Figure 2, the equilibrium interest rate falls and the equilibrium quantity of loanable funds rises.

Policy 2: Investment Incentives

Suppose that Congress institutes an investment tax credit, giving a tax advantage to any firm that builds a new factory or purchases new capital equipment.

1. This policy would shift the demand curve for loanable funds.

2. Because borrowers would demand more loanable funds at any given interest rate, the demand curve would shift to the right.
3. Hence, as shown in Figure 3, the equilibrium interest rate rises and the equilibrium quantity of loanable funds rises.

Policy 3: Government Budget Deficits and Surpluses

A **budget deficit** results when government spending exceeds tax revenue.

The government borrows by issuing bonds. The entire amount of government bonds outstanding, representing the accumulation of past government deficits, is the **government debt**.

A budget surplus can be used to retire (repay) existing government debt.

If the government's spending exactly equals tax revenue, then the government has a **balanced budget**.

Suppose that the government starts out with a balanced budget, but then either cuts taxes or raises spending, so that it now runs a budget deficit.

1. Recall that national saving consists of private saving plus public saving. When the government's budget swings to a deficit, that subtracts from national saving, shifting the supply curve for loanable funds.
2. The supply curve shifts to the left, since now there is a reduced supply of loanable funds at any given interest rate.
3. Hence, as shown in Figure 4, the equilibrium interest rate rises and the equilibrium quantity of loanable funds falls.

When the equilibrium interest rate rises, fewer families buy new homes and fewer firms buy new capital equipment. This reduction in investment because of government borrowing is called **crowding out**.

The History of US Government Debt

Figure 5 shows the amount of US government debt outstanding, expressed as a fraction of GDP.

Historically, the level of government debt has risen during wars, when the government runs a deficit to finance higher military spending.

But once the wars end, the government runs a budget surplus to pay down the debt.

An exception to this general pattern: government debt began rising again after President Reagan's tax cuts in 1981 and even now shows little sign of returning to zero.

Conclusion

This chapter shows how:

1. Financial institutions in the US economy allow some agents to save and others to borrow and invest.

2. In the economy as a whole, however, saving must equal investment.
3. The market for loanable funds coordinates individuals decisions so that saving and investment are always equal in the aggregate.