

# Savings and Investment

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# Savings and Investment in the U.S.

- This section looks at how **financial institutions** match one person's savings to another person's investment.
- **Financial markets:** Financial institutions through which savers can directly provide funds to borrowers.

# Savings and Investment in the U.S.

## ① The bond market

- Bond - A certificate of indebtedness.
- Corporations, governments, etc. issue (sell) bonds in order to finance purchases.
- Important: Buyer of the bond is the lender, seller is the borrower.
- Interest rate on the bond varies with the level of risk (e.g., time to maturity, credit risk)

# Savings and Investment in the U.S.

## ② The stock market

- Stock - A claim to partial ownership in a firm.
- Firms sell stock to raise money (equity finance).
- Compared to bonds, stocks offer higher returns but are also riskier.

# Savings and Investment in the U.S.

- **Financial intermediaries:** Financial institutions through which savers can indirectly provide funds to borrowers.
  - ① Banks: Take deposits from people who want to save and use deposits to make loans to people who wish to borrow.
  - ② Mutual funds: Institutions that sell shares to the public and use the proceeds to buy a portfolio of stocks and bonds. Allow people with small amounts of money to diversify.

# The National Income Accounts

- Recall that GDP can be written as the sum of the four components of expenditure:

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

- For the purposes of this section, we will assume that the economy is closed. This is an economy that does not engage in international trade or in international borrowing and lending. Thus,  $NX = 0$ .
- Then, we can write

$$Y = C + I + G \Rightarrow I = Y - C - G$$

# The National Income Accounts

- The term  $\underline{Y - C - G}$  represents the total income in the economy that remains after paying for consumption and government purchases. We call this amount national savings.
- Replacing this term with  $S$ , we have that savings equals investment.

# The National Income Accounts

- Let  $T$  denote the amount the government collects from households in taxes minus the amount it pays back in the form of transfer payments.
- Given this, we can write national saving as

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



# The National Income Accounts

- **Private saving:** The amount of income households have left after paying their taxes and for consumption:  $\underline{Y - C - T}$
- **Public saving:** The tax revenue that the government has after paying for its spending:  $\underline{T - G}$
- Two cases of note for public saving:
  - ①  $T > G$ : Budget surplus - government is receiving more than it spends.
  - ②  $T < G$ : Budget deficit - government is spending more than it receives.

# The National Income Accounts

## Example

Suppose GDP is \$8 trillion, taxes are \$1.5 trillion, private saving is \$.5 trillion, and public saving is \$.2 trillion. Assuming a closed economy, what is consumption, government purchases, national saving, and investment?

$$Y = 8, T = 1.5$$

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$$\begin{aligned} \text{National saving} &= \text{private} + \text{public saving} = \text{national investment} \\ &= .5T + .2T = .7T. \end{aligned}$$

# Savings versus Investment

- Savings: Occurs when income exceeds consumption
- Investment: Refers to the purchase of new capital

# Savings versus Investment

## Example

For each of the following, state whether the transaction would be considered savings or investment as defined by a macroeconomist.

- 1 Your family takes out a mortgage and purchases a new home.
- 2 You use \$200 of your \$800 paycheck to purchase stock in Apple.
- 3 You borrow \$2,000 from a bank in order to purchase a van for your new ghost hunting business.

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Savings

Investment

# The Loanable Funds Market

- **The market for loanable funds:** The market in which those who want to save supply funds and those who want to borrow to invest demand funds.
- Assumptions:
  - This is the only financial market.
  - There is one interest rate, which is both the return to saving and the cost of borrowing.

# The Loanable Funds Market

- Supply: Determined by savers - households who have extra income to save and lend out (either directly or indirectly)
- Demand: Determined by borrowers - households and firms who wish to borrow in order to make investments
- The price of a loan is the real interest rate. It represents the amount that borrowers pay for loans and the amount savers receive on their savings.

# The Loanable Funds Market

- A higher interest rate means that the cost of borrowing is greater, so as the interest rate increases, the quantity of loanable funds demanded will decrease.
- Thus, the demand curve for loanable funds is downward-sloping.

# The Loanable Funds Market

- Conversely, a higher interest rate means that the returns to savings is greater, so as the interest rate increases, the quantity of loanable funds supplied will increase.
- Thus, the supply curve for loanable funds is upward-sloping.

# The Loanable Funds Market

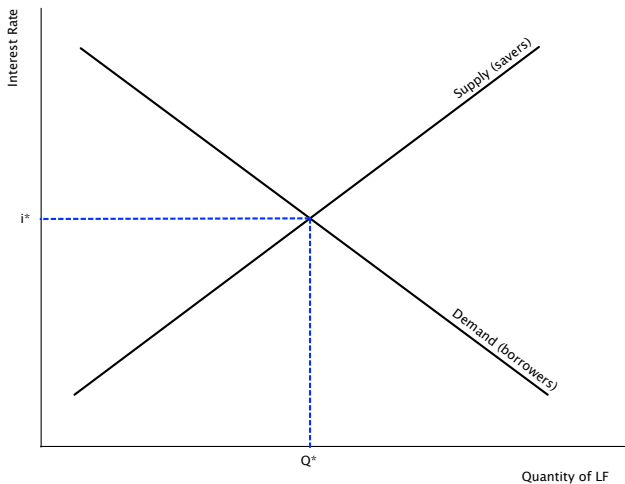


Figure: The Market for Loanable Funds

# The Loanable Funds Market

- The analysis of the loanable funds market is the same as what we saw in other markets.
- If the interest rate is too high, then there will be a surplus of loanable funds because the quantity demanded will be less than the quantity supplied.
- As such, there will be downward pressure on the interest rate until it reaches the equilibrium rate.
- If the interest rate is too low, then there will be a shortage of loanable funds, and thus upward pressure on the interest rate.

# The Loanable Funds Market

- Importantly, because the real interest rate more accurately reflects the actual return to savings and cost of borrowing, the equilibrium in the loanable funds market is interpreted as determining the *real* interest rate in the economy.
- Several policies can affect the market for loanable funds by encouraging more savings or investment.



# The Loanable Funds Market

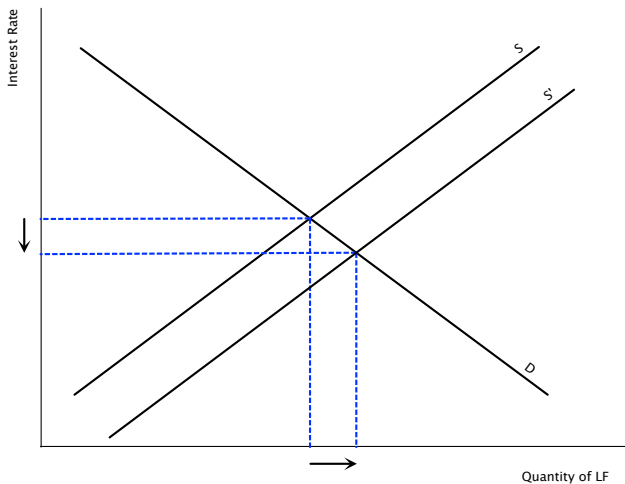


Figure: Saving Incentives

# The Loanable Funds Market

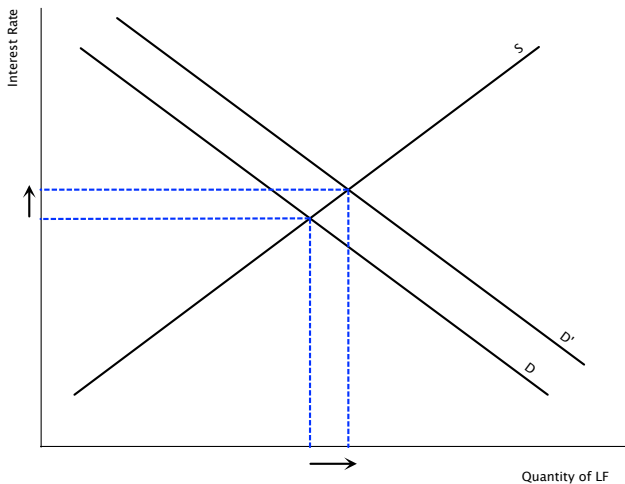
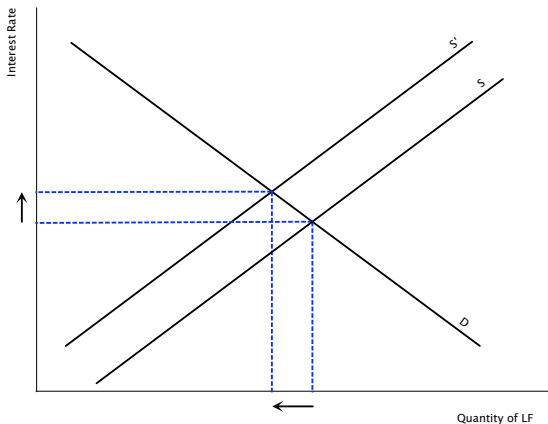


Figure: Investment Incentives

# The Loanable Funds Market

- **Crowding out:** A decrease in investment and consumption that results from government borrowing. A deficit decreases investment because it causes the equilibrium interest rate to increase.



# The Loanable Funds Market

## Example

Use the market for loanable funds to explain what will happen to the quantity of savings, quantity of investment, and the interest rate when each of the following occur.

- (a) A technological advance increases the profitability of new investment to firms.
- (b) The federal budget deficit increases.
- (c) A consumption tax is imposed.

# The Time Value of Money

- **Present value:** The amount of money today that would be needed to produce a future amount using prevailing interest rates.
- **Future value:** The amount of money in the future that a certain amount of money today will yield given prevailing interest rates.
- Formula:

$$PV = \frac{FV}{(1 + i)^t}$$

where  $t$  represents the number of periods to discount.

- Note that as the interest rate increases, the present value decreases.

# The Time Value of Money

## Example

If the interest rate is 10%, then what is the present value of \$100 to be paid in two years? What if the interest rate was 15%?

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$$PV = 100/(1.10)^2 = 82.64$$

$$PV = 100/(1.15)^2 = 75.61$$



# The Time Value of Money

## Example

The price of a bond is the sum of the present value of its future payments. Suppose you purchase a bond today that promises to pay \$75 one year from now, \$75 two years from now, and \$1075 three years from now. If the interest rate is 7.5%, what is the price of this bond today?

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$$P = 75/1.075 + 75/1.075^2 + 1075/1.075^3 = 1000.$$

# The Time Value of Money

## Example

A year after you buy your bond, you decide to sell it in order purchase a new computer. If the market interest rate is still 7.5%, what is the fair price for your bond? What if the interest rate was 10%?

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$$P = 75/1.075 + 1075/1.075^2 = 1000$$

$$P = 75/1.10 + 1075/1.10^2 = 956.61.$$

- Note that the price of a bond and interest rates are inversely related.

# Readings and Assignments

- Today: Mankiw Ch. 26
- Next time: Mankiw Ch. 28
- Problem Set 5, section 3