



## LESSON 23

# Interest Rates: Let's Go Shopping for Money

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### LESSON DESCRIPTION

Students learn through various examples how interest rates affect the cost of borrowing and the final total cost of major purchases, such as cars and houses. Then, students work with supply and demand graphs to see how market forces shape interest rates. Finally, students gain an understanding of the factors that cause interest rates to differ.

Learning about how interest rates are determined by markets and the fundamental role of savings will prepare students for a deeper understanding of macroeconomic principles and monetary policy. In addition, students will gain a better understanding of how interest rates will affect their personal financial decisions.

### INTRODUCTION

An interest rate is the price paid for using someone else's money, expressed as a percentage of the amount borrowed. Interest rates have a major impact on consumers' lives as well as the national economy. Low interest rates encourage borrowing by making it more affordable, and consumers and business firms are more likely to make major purchases, stimulating demand for goods and services. High interest rates discourage borrowing by making it more costly, and consumers and businesses will curtail major purchases.

### COMPELLING QUESTION

How are interest rates determined—and why are there so many?

### CONCEPTS

Interest rate  
Financial institution  
Certificate of deposit (CD)  
Commercial bank  
Credit union  
Federal funds rate  
Prime rate  
Mortgage  
Automobile loan  
Credit card  
Real interest rate  
Nominal interest rate

### OBJECTIVES

Students will be able to:

- Define interest rates.
- Explain who benefits from and who is hurt by high and low interest rates.
- Explain how the interaction of savers and borrowers determines market interest rates.
- Identify the factors that shape specific nominal interest rates, such as mortgage or credit card interest rates.

### CONTENT STANDARDS

#### Voluntary National Content Standards in Economics

- Standard 7: Students will understand that a market exists when buyers and sellers interact. This interaction determines market prices and thereby allocates scarce goods and services.

- Standard 12: Students will understand that interest rates, adjusted for inflation, rise and fall to balance the amount saved with the amount borrowed, which affects the allocation of scarce resources between present and future uses.

### Common Core State Standards

- CCSS.ELA-Literacy.L.11-12.6: Acquire and use accurately general academic and domain-specific words and phrases, sufficient for reading, writing, speaking and listening at the college and career readiness level; demonstrate independence in gathering vocabulary knowledge when considering a word or phrase important to comprehension or expression.

### TIME REQUIRED

90 minutes. Procedures 1–18, 45 minutes on the first day; procedures 19–37, 45 minutes on the second day.

### MATERIALS

- Slides 23.1–23.23
- Activities 23.1 and 23.2, one copy each, cut apart
- Optional: Online interest rate calculator for slides at <http://hseconomics.councilforeconed.org>



### PROCEDURES

(Note: This lesson may be used in a personal finance or economics class. In a personal finance class, teachers may wish to use procedures 1–12 to define interest rates and explain how interest rates affect consumer and business decisions, then use procedures 27–34 to examine why people obtain different interest rates. In an economics class, teachers may wish to begin at procedure 12, with a brief discussion of high and low interest rates, skip procedures 31–34, and conclude with the discussion of nominal and real interest rates [procedures 35–37]. If you

are using only portions of the lesson, modify Closure [procedure 38], as appropriate.)

### Day One

- (Note: As an alternative to the slides, an online interest rate calculator can be found at <http://hseconomics.councilforeconed.org>.) Show Slide 23.1 and tell students: You want to buy this new car. It costs \$20,000, and you don't have that much money. Ask students the following:
  - How could you get the money?  
*Save or borrow*
  - What are the advantages of saving?  
*You don't have to pay extra in interest; don't have to pay anything back.*
  - If you borrow, you will have to get a loan. What is a loan?  
*It's using someone else's money for a period of time.*
  - If you take a loan from a bank, what do you have to pay?  
*Interest. The bank makes you pay back more than you borrowed to compensate the bank for the use of its money.*
  - When do you have to pay back the money?  
*You pay back a little at a time, usually in monthly payments.*
  - What are the advantages of borrowing?  
*You can buy the car now or you don't need to spend your own money.*
- Continue by telling students: Let's say you need the car now, so you decide to borrow the money. You will need an automobile loan. Where can you get a loan?

*Family, bank, credit union, savings and loan, credit card*

Tell students: Your family doesn't have \$20,000 to buy you a car, so you shop around and find four possible loans.

3. Show Slide 23.2. Tell students that each of these institutions will charge you interest, which is the price of the loan. Tell students that the slide lists the various interest rates:
  - Midtown Bank: 48-month loan at 4 percent
  - Century Credit Union: 48-month loan at 2 percent
  - YourCharge credit card: 48-month loan at 18 percent
  - Al's Car Emporium: 48-month loan at 8 percent
4. Ask: Assuming each one is equally accessible, each one charges the same fees, and you'll be approved at all of them—which one would you choose?

*Century Credit Union*

Why?

*It has a lower interest rate; the price of money is lower. (Note: Many students will instinctively grasp this, even if they don't understand what the interest rate is.)*

5. Continue: If you're not sure, let's look at this choice another way.

Show Slide 23.3. Tell students that the slide shows their estimated monthly payments.

- Midtown Bank: \$451.58
- Century Credit Union: \$433.90
- YourCharge credit card: \$587.50
- Al's Car Emporium: \$488.26

Ask: Which one would you choose?

*Century Credit Union*

Why?

*The monthly payment is the lowest.*

6. Continue: Here is one more way to look at it—your total payment at the end of four years.

Show Slide 23.4.

- Midtown Bank: \$21,675.84
- Century Credit Union: \$20,827.20
- YourCharge credit card: \$28,200
- Al's Car Emporium: \$23,436.48

Ask: Now, which one would you choose?

*Century Credit Union*

Why?

*The car will actually cost less.*

7. Ask: What is an **interest rate**?

*The price paid for using someone else's money, expressed as a percentage of the amount borrowed.*

Show Slide 23.5. Explain to students: Just as cars, houses, food, and other items you buy have prices, money also has a price. Borrowers pay for the use of money. Ask: Why do interest rates matter?

*Higher interest rates mean you have to pay more.*

Is it true that lower interest rates are always better?

*Students may have to think this over. Some may agree, others may realize that savers and lenders want higher interest rates.*

8. Continue: Imagine that you have \$10,000 in savings. You can save this money for 10 years before you want to use it toward buying a house. You could, of course, just keep the money as

cash and, at the end of 10 years, you'd still have \$10,000—but it would be worth less, due to inflation. If you save it in a financial institution, you can earn interest.

Show Slide 23.6. Tell students that they have four options as shown on the slide.

- Passbook account at Midtown Bank pays 1 percent per year.
- Passbook account at Century Credit Union pays 0.25 percent per year.
- Five-year certificate of deposit (CD) at Johnson Bank pays 4 percent per year.
- Ten-year certificate of deposit (CD) at Top End Brokerage pays 5 percent per year.

9. Explain these terms:

- A **commercial bank** is a for-profit **financial institution** that takes deposits, and lends the money to other consumers or firms.
- A **credit union** also takes deposits and makes loans, but is generally not-for-profit and serves only its members, who share a common bond, for example, having the same employer.
- A **certificate of deposit (CD)** is like a savings account, but the depositor cannot withdraw the money for a set time—in this case, five or 10 years—without paying a penalty.

10. Continue: Again, assuming everything else about these four opportunities is the same, which would you choose?

*The 10-year CD*

Why?

*The rate is higher; you are being paid more.*

11. Continue: If you are still not sure, let's look at this a different way: How much money would you have at the end of 10 years?

Show Slide 23.7.

- Savings account at Midtown Bank: \$11,051
- Savings account at Century Credit Union: \$10,253
- Five-year CD at Johnson Bank: \$14,908
- Ten-year CD at Top End Brokerage: \$16,470

Ask: Which one would you choose?

*The 10-year CD*

Why?

*Because you have a lot more money.*

So, did you want a low interest rate, or a high interest rate?

*High*

12. Have students use thumbs up to indicate high and thumbs down to indicate low. Ask the following series of questions:

a. If you are borrowing money, do you want a high or low interest rate?

*Thumbs down; low*

b. If you are saving money, do you want a high or low interest rate?

*Thumbs up; high*

c. Now, we just need one more piece to make sense of interest rates. Where does the money you borrow come from?

*Students will probably say banks.*

13. Explain to students that money is generally borrowed from banks or other financial institutions, but these institutions actually get the money from their other customers—the savers. Tell students that a market determines interest rates—the market of borrowers who want low interest rates and savers who want high interest rates.

14. Explain that savers are the “suppliers” of money. Ask students to imagine that they have just earned \$1,000 at their part-time job. Ask students to raise their hands if they would be willing to keep this money in a savings account at zero interest, instead of spending it on something they want now.

*Very few students would do so.*

Ask for a show of hands: Who would be more likely to save at an interest rate of 2 percent?

*A few might do so now.*

What if the interest rate was 6 percent? Eight percent? Fifteen percent? Twenty percent?

*More students should raise their hands each time. Continue raising the interest rate until most students indicate that they would be willing to save, rather than spend.*

Show Slide 23.8. Explain that all savers, like them, are willing to deposit more money in banks when interest rates are high, making it available for borrowers.

15. Explain that borrowers are “demanders” of money. Remind students that they were much more willing to borrow from financial institutions that offered lower interest rates. Show Slide 23.9 and review the points on the graph. Ask: What do you think will happen when we put the supply and demand for loans together on one graph?

*It will be a market, just like the market for corn or oil or other commodities.*

16. Show Slide 23.10 and discuss the following:

- a. Where does the supply of funds come from?

*Savers*

- b. Where does the demand for funds come from?

*Borrowers*

- c. What will happen in the market for loans if more people want to borrow at the same time? Show Slide 23.11.

*The slide shows the demand curve shifting right.*

- d. What will happen to the equilibrium price?

*It increases.*

- e. What will happen in the market if lenders think more borrowers than normal may not repay their loans? Show Slide 23.12.

*The supply will shift to the left as fewer lenders are willing to make loans.*

- f. What will happen to the equilibrium price?

*It will increase.*

- g. If you hope to borrow money to buy a new car, do you want a high or low interest rate?

*Low*

- h. What if you are saving money for college?

*High*

- i. Do households save and borrow money at the same time?

*Yes, people frequently borrow to buy a house, yet save for retirement.*

### CLOSURE (Day One)

17. Create and hand out exit slips with the following questions:

- a. Define interest rate.

*The price paid for using someone else's money, expressed as a percentage of the amount borrowed.*

- b. If you are saving money, do you want a high or low interest rate?

*High*

Why?

*You will have more money in the end.*

- c. If you are borrowing money, do you want a high or low interest rate?

*Low*

Why?

*The loan will cost you less.*

- d. How are equilibrium interest rates determined?

*In a market of savers and borrowers*

18. Use the exit slips to determine whether students grasp this information or whether additional review is necessary before beginning Day Two.

## Day Two

19. Begin with Slide 23.10. Review the four questions from the exit slip and address any questions.

20. Show Slide 23.13 with interest rates for a 20-year period—the federal funds rate, the prime rate, the 30-year fixed mortgage rate, the automobile loan rate, and credit card interest rate. Ask: When we were talking about interest rates yesterday, which one of these were we talking about?

*Students probably won't know; they may guess federal funds rate because it is lowest or credit card rate because it is highest.*

21. Show Slide 23.14 with definitions of the five interest rates. Explain:

- The **federal funds rate** is the rate one bank charges another bank for overnight loans of funds held at the Federal Reserve.

- The **prime rate** is the rate banks charge their best customers—for example, the rate a bank might charge a large company like Microsoft or Kellogg's.
- The 30-year fixed **mortgage** rate is the rate banks charge people who borrow money to buy a house and repay it over 30 years.
- The **automobile loan** rate is the rate banks charge customers for car loans.
- A **credit card** rate is the amount a credit card company charges those who use credit cards for purchases or to borrow money.

22. Explain: In the United States, the federal funds rate is the lowest rate. It is considered the “benchmark” interest rate, and is set by a market, as seen yesterday, but the market primarily consists of banks. When banks have a lot of money on hand—excess reserves—the federal funds rate is low. When bank reserves are short, the federal funds rate is high.

23. Return to Slide 23.13. Ask:

- a. Why do you think the federal funds rate is so low, compared to the others?

*It is short term, low risk.*

- b. Why are mortgage rates higher than the federal funds rate?

*Borrowers need the money for a long period of time, and there is a higher risk of it not being repaid.*

- c. Why are mortgage rates lower than credit card rates?

*Mortgages have the house as collateral, so lenders can take the house in cases of default.*

24. Explain that you can think about the family of interest rates as a hand. Hold your right hand up, facing you. Show Slide 23.15. Explain to students that your pinkie finger is the federal funds rate. Ask:

a. Which rate is your ring finger?

*Prime rate*

b. What rate is the 30-year mortgage rate?

*Middle finger*

c. Which rate is the automobile loan rate?

*Index finger*

d. Which rate is the credit card rate?

*Thumb*

25. Demonstrate to students that when the pinkie finger dips down, illustrating a decrease in the federal funds rate, all of the other rates dip, as well. When the pinkie finger moves upward, the other rates increase, as well. Explain that these are just a sample of interest rates—there are many more: adjustable-rate mortgages and 15-year mortgages, for example.

26. Review: Which rate is considered the benchmark interest rate in our economy?

*Federal funds rate*

What will happen to the interest rate on a home mortgage if the federal funds rate increases?

*It is likely to increase.*

Why do banks increase other rates if the federal funds rate is higher?

*Guide students toward reasoning that if banks have to pay more to get money, they will have to charge more for the money they lend. Also, when banks anticipate inflation, they will charge customers an “inflation premium” to protect against losing value.*

27. Explain that the actual interest rate any saver or borrower obtains is based on a lot of factors related to the purpose of the loan: size of loan, time period, risk, and collateral. Show Slide 23.16. The main point is that savers and lenders want to

make sure they get their money back—and more.

a. **Size of loan:** Lenders charge higher interest for larger loans. They are taking a bigger risk by lending you a higher percentage of their total funds.

b. **Length of time:** Lenders charge higher interest if you want to borrow money for a long time. Again, this is a bigger risk because you are tying up the lenders’ funds for more time. This factor is also called maturity.

c. **Risk:** Lenders charge higher interest to riskier borrowers. A reliable borrower with a good reputation will pay less. Explain that there are credit reporting agencies that track an individual’s borrowing history and give them a credit rating, which lenders then access to help them evaluate risk.

c. **Collateral:** Lenders charge higher interest rates on loans without collateral—an asset that a lender can seize if you default. If you fail to repay a house or auto loan, lenders can take your house or car—not as punishment, but to recoup some of the money they have lent.

28. To test students’ understanding, have them identify which rate would be higher among each of the following pairs of rates and explain why:

a. Auto loan versus mortgage loan

*Typically the automobile loan, because even though it is shorter in length, the risk is higher because some people do not repay the loans.*

b. Fifteen-year mortgage versus 30-year mortgage

*Thirty-year mortgage, because the borrower keeps the money for a longer time.*



- c. Auto loan versus credit card loan

*Credit card loan, because there is no collateral.*

- d. One-year CD versus five-year CD

*Five-year CD, because the bank keeps the depositor's money for a longer time.*

29. Continue: Do you think all individuals can obtain the same interest rates if they are getting the same type of loan—for example, an auto loan?

*Answers will vary. Explain that some borrowers are charged much higher interest rates than others, due to personal circumstances.*

30. Show Slide 23.17. Tell students that these three individuals each went to Midtown Bank to borrow money. Maggie was given an interest rate of 4 percent. Juan was told his rate would be 8 percent. Sam was told 12 percent. Ask students: What could explain the difference in interest rates?

*Encourage students to brainstorm; they will probably ask what each individual is borrowing for, how much, how long, maybe something about them personally, their job or reliability, how many other debts they have.*

31. Begin Activity 23.1. Ask for five volunteers to be potential customers who want to borrow money from a bank. Give each of the volunteers a Borrower Information card and name tag and ask them to review their materials in the hall for 3–5 minutes. Borrowers will need to honestly answer any questions they are asked during the lending process. Explain to the rest of the class that they comprise a bank with \$100,000 to lend, and they must decide whom they will lend to and what interest rate they will offer. Ask students to brainstorm the questions they will ask the potential customers, and make a list on paper. Show Slide 23.18.

*Some ideas students may propose: Why do you want to borrow the money? Will there be collateral on this loan? How long do you want to borrow the money for? Do you have a job? Have you repaid other loans? Slide 23.19 suggests some questions the Bank may want to ask.*

Have one or two volunteers ask the questions, while the rest of the class records the information on paper.

32. Have Borrowers return to the room and take seats up front. Show Slide 23.20, with the Borrowers' names. The volunteers should ask questions of each of the potential Borrowers, gathering as much information as they can.
33. After the questioning, have Borrowers leave the room again. Instruct students (as the Bank) to discuss Borrowers' answers and choose one person to receive a loan.
- There is no right answer to this activity. The goal is for students to discuss factors such as the length of the loan, amount of the loan, riskiness of the borrower, and prospects for repayment.*
34. Conclude by asking Borrowers to return so that the Bank can explain who was approved. After the decision is explained, tell students that all five applicants might be able to borrow in reality, but some would be likely to be charged significantly higher interest. Ask:

- a. Who would be most likely to get a loan?

*James is probably the safest bet, because he has a high income, a down payment, and his home will serve as collateral.*

- b. Who would be charged the highest interest rate?

*Diana and Michael have the least collateral and are probably the riskiest borrowers.*

- c. Which factors count against the borrowers?

*Lower income, lack of collateral, having substantial outstanding loans, defaulting on past loans, and borrowing a large amount*

- d. Is it fair to charge riskier borrowers higher interest rates?

*Encourage students to think of higher rates as a form of insurance against default—more of the risky borrowers may default, so all risky borrowers pay more.*

35. Explain that another key factor in interest rates is inflation. Inflation occurs when the average level of prices of goods and services in an economy increases. Inflation means that money is losing value. When institutions such as banks (or private individuals) lend money, they want to be repaid in equally valuable money, but inflation causes monthly payments to lose value. If lenders expect inflation, they will charge additional interest to compensate.
36. Show Slide 23.21 to explain how banks adjust interest rates for inflation. Show Slide 23.22 (same as 23.15) and use your hand to illustrate that when inflation increases, all interest rates move higher. Show Slide 23.23. Explain that all of the interest rates defined earlier in the lesson are called **nominal rates**, meaning they are not adjusted for inflation. Businesses and consumers adjust nominal interest rates for inflation by subtracting the inflation rate. This is called a **real interest rate**. The real interest rate reflects how the purchasing power of the amount borrowed (loaned) changes over time.
37. Write on the board a nominal interest rate of 10 percent. Explain that the borrower will have to pay 10 percent more dollars at the end of one year. Write on the board an inflation rate of 3 percent. Find the real interest rate of 7 percent by subtracting the inflation

rate from the nominal interest rate. Explain that the purchasing power of the amount the borrower will pay back at the end of the loan has increased by 7 percent, which means the lender's purchasing power for those dollars repaid has increased by 7 percent—the lender's reward for lending the money.

## CLOSURE (Day Two)

38. Ask the following questions for review:

- a. What do economists mean by the term “interest rate”?

*The price banks or other lenders charge for the privilege of borrowing money.*

- b. How are interest rates determined?

*By a market of savers and borrowers*

- c. Who wants high interest rates?

*Savers and lenders*

- d. Who wants low interest rates?

*Borrowers*

- e. What happens to interest rates when there is a lot of savings but not much demand for loans?

*Interest rates decrease.*

- f. What happens to interest rates when there is heavy demand for loans?

*Interest rates increase.*

- g. What is the difference between a nominal interest rate and a real interest rate?

*The real interest rate is adjusted for inflation.*

- h. If your bank is advertising a 5 percent 30-year mortgage rate, is that a nominal interest rate or a real interest rate?

*Nominal*

- i. Do all borrowers get the same interest rate?

*No.*

- j. What factors influence the interest rate a particular borrower gets?

*Loan size, length of time, risk, collateral*

## ASSESSMENT

### Multiple Choice

- An interest rate is best defined as
  - the total cost of a loan.
  - the change in the price level over time.
  - the price lenders charge borrowers to use money.**
  - the price borrowers charge lenders to use money.
- The 30-year mortgage interest rate recently increased. Which of the following could explain this change?
  - An increase in the supply of funds available to be borrowed
  - A decrease in the demand for mortgages
  - A decrease in the supply of funds available to be borrowed**
  - A decrease in the demand for auto loans
- Which type of loan is likely to have the highest interest rate?
  - A short-term loan with collateral
  - A short-term loan with no collateral
  - A long-term loan with collateral
  - A long-term loan with no collateral**

### Constructed Response

Consumers and businesses frequently borrow money for major purchases, and market interest rates have a large influence on these borrowing decisions.

- Define interest rate.

*The price lenders charge borrowers to use money, expressed as a percentage of the amount borrowed.*

- Would a consumer who borrows money to buy a house prefer a low or high interest rate? Explain.

*Low, because he or she will pay less for his or her loan and house.*

- Would parents saving money for their child's college education prefer a low or high interest rate? Explain.

*High, because their savings will grow more quickly.*

- What is the difference between nominal and real interest rates?

*Real interest rates are adjusted for inflation.*

- Suppose American households become thriftier or more willing to save. What do you predict will happen to interest rates and the quantity of money available to borrow?

*Interest rates will decrease and the quantity of money available will increase—a supply shift to the right.*

## ACTIVITY 23.1

### Who Will You Lend To?

#### Borrower Information Cards

**Borrower Information: James Shen, age 32**

- Wants to borrow \$100,000 for a 30-year mortgage. He is married with one child and is buying a 1920s house that needs quite a bit of repair, in an older city neighborhood. He plans to live in the house.
- James has a master's in business administration (MBA) and a job with an energy company that pays \$75,000 a year. He has saved \$20,000 toward his down payment and also has a retirement account. His wife does not work.
- James has paid off his auto loan, and his car is valued at \$15,000. He and his wife are up to date on repaying their student loans, although they still owe \$60,000.

**Borrower Information: Amanda Sykes, age 22**

- Wants to borrow \$25,000 for a five-year auto loan. She is buying an SUV that she will drive long distances for work. A car is required for her job, and her old car has more than 250,000 miles on it. She has several speeding tickets on her driving record.
- Amanda has an undergraduate degree in marketing and is just starting work as a sales representative for a pharmaceutical company. She will earn \$30,000 a year.
- Amanda has not yet begun repaying her student loans of \$30,000. She does not own a house or have other major assets. She is single.

**Borrower Information: Diana Starr, age 29**

- Wants to borrow \$75,000 for a 10-year business loan to start a fashion design company. She has worked in clothing design for various major companies and wants to launch her own label. She has an undergraduate degree in fashion merchandising.
- In her current job, which she plans to quit if she gets the loan, she is earning \$35,000 a year. She does not have a savings or retirement account; she spends most of her disposable income on clothing and travel. She does not own a home and is driving an old car valued at \$3,000, which she got from her parents.
- Diana has never taken out a bank loan before, although she has used credit cards. She is single.

## ACTIVITY 23.1 (Continued)

### **Borrower Information: Michael O'Neill, age 18**

- Wants to borrow \$100,000 for a 25-year student loan to attend a private liberal arts college. He has a student financial aid package that will pay the rest of his costs over four years.
- Earned a GPA of 3.2/4.0 at a well-regarded prep school and a 29 on the ACT. He plans to major in history.
- Has worked part-time at a fast food restaurant since he turned 16 and has paid for his auto insurance and gas, although he drives a car belonging to his parents. Michael does not have savings. He plans to continue to work for his spending money. He is single.

### **Borrower Information: Trevor Johnson, age 35**

- Wants a \$75,000 15-year home equity loan to remodel his home's kitchen and install new windows. His house is a 1970s two-story in a suburban neighborhood. The current value is about \$250,000, and he owes \$220,000 on his mortgage.
- He works as a restaurant manager, earning \$45,000 a year. He is married and has two children, and his wife earns \$15,000 a year as a part-time legal secretary.
- He and his wife owe \$30,000 on two auto loans and \$25,000 on her student loans. She defaulted on a car loan in her early 20s when she lost a job. They now have \$20,000 in savings and a small retirement account.

## ACTIVITY 23.2

### Name Tags for Borrowers

James Shen

Amanda Sykes

Diana Starr

Michael O'Neill

Trevor Johnson