

## Your Economic System: Investing

At this level, students can purchase certificates of deposit (CDs) that provide flat rates of interest depending on the term, meaning how long the student must leave the money invested.

### How It Works

Students can invest in CDs with various terms. To keep the process simple, each CD pays a flat sum at maturity, instead of a percentage rate of the original investment (accumulated interest). The longer the term, the greater the reward to the investor.

CDs come in terms of 1, 3, 6, or 8 months (with 8 months being a "full-term" CD, ending just before the final auction of the school year). To simplify recordkeeping, students can invest only in \$100 increments, and only on Bill Day each month.

*Example:* \$100 invested in a 1-month CD on Bill Day will yield the student \$15 at the maturity date, the next Bill Day. This table illustrates the money students can earn by investing \$100 for 1, 3, 6, and 8 months:

| \$100 invested                      | 1<br>Month | 3<br>Months | 6<br>Months | 8 Months (or until just before<br>the final auction of the year) |
|-------------------------------------|------------|-------------|-------------|------------------------------------------------------------------|
| Earnings at the end of each<br>term | \$15       | \$50        | \$120       | \$200                                                            |
| Balance at maturity                 | \$115      | \$150       | \$220       | \$300                                                            |

**Note:** *In the real economy*, these earnings would be high for a typical CD. We set them at this level to help the students perceive the trade-off involved: the allure of extra income versus the opportunity cost of tying up their money for the term of the CD—a period in which they won't have it to spend at the auction, for example. As is the case with all time deposits, the longer the student's commitment in term, the larger the reward at maturity.

From the first Bill Day through the second-to-last Bill Day of the year, the students can choose to invest any amount (in \$100 increments) in CDs. Initially, terms of 1, 3, or 6 months, or full-term (8 months) are available. However, as time passes, the longer-term CDs naturally become unavailable because they would extend past the end of the school year.

### Tip:

- The Investment Banker should record which students have purchased a CD, the amount invested, the term of the CD (1, 3, 6, or 8 months), and the maturity date and payout ([see classroom investment log](#)).

### Questions

What factors determine how much money I get back in return for my investment?

The main factors that determine CD returns for the classroom economy are the term of the deposit and the size of the deposit:

- **The term of the deposit.** Longer-term CDs have a higher interest rate than shorter-term CDs because banks must compensate lenders for keeping their money longer. Banks want the money because they can use it to earn more than they are paying to the investor. Their earnings come from lending the money out at higher interest rates or putting it in higher-paying investments.
- **The size of the deposit.** Larger time deposits (for example, jumbo CDs, which have a minimum deposit of \$100,000) pay higher rates. However, to simplify recordkeeping in the classroom economy, we do not increase the payout rate for larger investments. If a student chooses to invest \$200 in a 1-month CD, for example, the student will earn \$30—as if it were two \$100 investments.

### What about interest rates?

We have simplified this investment activity by using a flat dollar amount as the return on the investment, but some students may ask about the impact of interest rates.

Students should know that an interest rate is the cost of borrowing money, or the payment for lending money. From the students' perspective as lenders, the rate needs to be high enough to compensate them for the following:

- **Liquidity preference:** Simply put, people want to have access to their money just in case they need it for an immediate purchase or an emergency. For example, if the student is not insured and has incurred damages to his or her desk, he or she needs to be "liquid" to be able to pay for repairs.
- **Deferred consumption.** By investing in a CD for 3 to 6 months, the student is deferring his or her consumption of other goods, such as anything he or she could have bought at Auction Day.
- **Risk of the investment.** In the real economy, a lender incurs the risk of losing money if a borrower defaults on a loan or files for bankruptcy protection. However, traditional CDs are similar to bank savings accounts in that CD purchases of up to \$250,000 per depositor are insured by the Federal Deposit Insurance Corporation (FDIC) and thus are virtually risk-free to the buyer.

The concept of **compounding** can be described as one of the factors contributing to higher returns over time. However in our activity, we do not compound. If the students do the math, they'll notice that a 15% return compounded over 3 months will result in a \$152 payout.

### What if I need the money? Can I still withdraw it prior to the maturity date?

Withdrawals before maturity are usually subject to a substantial penalty. These penalties reinforce that it is generally not in a CD holder's best interest to withdraw the money before maturity—unless the holder has the opportunity to make another investment with a significantly higher return (which would typically incur more risk and is not an option in the classroom economy) or has a serious need for the money.

Banks typically charge a penalty fee if money is withdrawn from a CD before it matures.

To keep things simple in our investment activity, we do not provide the students the option to withdraw from the CD prior to maturity. However, if you have a situation where a student needs the cash (for example, to pay for damages or rent), you may want to permit an early

withdrawal—if the student is willing to pay a penalty. A penalty or fine can be lost interest and/or a small percentage of the principal.

### **Your Economic System: Insurance**

Students have the option of purchasing homeowners' insurance to cover the desk they rent or own. Students who buy insurance are protected from the "property damage" that could befall the class each week; uninsured students will need to pay for repairs.

### **How it Works**

Students can buy insurance on Bill Day. They can pay for it in one of two ways:

- With a one-time yearly purchase fee of \$1,200.
- With a monthly fee of \$200.

Accidents are created (or avoided) by our insurance simulator, which uses random-number generation to determine the outcome. To best illustrate a reasonable trade-off between insurance costs and benefits, we recommend using the simulator 30 times during the school year (approximately once a week after the first month of school).

### **How property damage is assessed**

The insurance simulator randomly selects a number between 1 and 10. The number determines whether there is damage to the desks and, if so, the degree of severity and cost of repair. Students who own insurance are covered for all expenses, but students without insurance will be billed for repairs and the following amounts will be deducted from their accounts:

- No damage: pay \$0.
- Minor damage: pay \$100 for repairs.
- Moderate damage: pay \$150 for repairs.
- Major damage: pay \$200 for repairs.

### **How to manage insurance sales**

- On Bill Day, the Insurance Agent will ask who wants to purchase insurance. Each purchaser will log the payment in his or her bank log, and the Agent will initial the purchase. The Agent will then record the purchaser's name in the [insurance log](#) (see details below).
- Throughout the month, the Insurance Agent will run the insurance simulator, keep track of the damages, and record them in the insurance log. At the end of the month, the Agent will determine each student's monthly required payment and record it in the log.

### **The insurance log**

The insurance log helps the Insurance Agent keep a detailed record of the insurance sales and payments of the class. For the Insurance Purchases portion, the Agent lists every student's name, and then each month records whether he or she has purchased insurance. In the Simulation Records section, the agent records the results of each simulation. The Agent records both the type of damage that was displayed by the insurance simulator and the

amount of money that must be paid for damages. . The Auditors will receive a copy of these logs from which they will easily be able to determine which students owed repair payments each month.

### Additional information

- Students who don't see the value of insurance protection will probably soon find themselves owing money for damage repair. These students must deduct the repair payments from their bank logs. They will do so each week on the honor system, but the payments will later be verified when the Auditor cross-references their bank logs with the insurance log.
- An uninsured student who changes his or her mind will need to wait until the beginning of the next four-week period to buy insurance. Restricting purchases to four-week intervals (or on the first of each month) not only makes recordkeeping easier but allows the student to experience the potentially costly consequences of skipping insurance coverage.
- Students who decide to pay for insurance monthly can opt to let their coverage lapse by not paying for it when the next Bill Day comes. The Insurance Agent updates the insurance log and prepares to verify payments are deducted for weekly damages, if any.
- For those interested in the mathematics of this insurance scheme, here are the details: Each simulation has an expected result of \$70 in damages; the calculation is  $[(0.5)(\$0) + (0.2)(\$100) + (0.2)(\$150) + (0.1)(\$200) = \$70]$ . Assuming that 30 simulations are executed during the school year, students without insurance can expect to pay, on average, \$2,100 for damages. Thus, on average, uninsured students will pay \$900 more for damages than they would have paid for insurance—a good illustration of how what seems to save money in the short term can actually cost much more in the long run.

### Questions

#### How do insurance companies make money?

Insurance company profits can be reduced to a simple equation: **profit = premium payments minus incurred losses**. Note that this is extremely simplified, in that it does not include the cost of underwriting expenses and investment income.

In the classroom economy, we do not record any payments to the insured students for property damage (these would be the "incurred losses" to an insurance company). We simply assume that these students don't have to pay out of pocket for the repairs.

Another big difference is that the classroom insurance scheme would not be profitable in reality. In a class of 20 students, the Insurance Agent can collect a maximum of \$32,000 over the school year (if everyone paid the monthly fee of \$200 x 8 months). On the other hand, the simulator assumes average damage of \$2,100 per student, so the assumed payout totals \$42,000—a loss of \$10,000 for the insurer, if there were one.

In case a student asks about this math, you can explain that if a real insurance company experienced average claims this high, it would charge much higher fees. Price-setting in the insurance business is often called an "actuarial science." Simply put, the price of insurance coverage (called a premium) is determined by skilled underwriters who identify the risks and

decide how much to charge for accepting those risks. In *My Classroom Economy*, we are keeping the fees low and the probability of possible damages higher, to better illustrate the cost and consequences of risk-taking.