Everything You Wanted to Know About Figuring Interest

Credit isn't free. The cost of credit is called interest or the finance charge. The finance charge may be stated in dollars or as a percentage of the loan. When stated as a percentage of the loan, it is called the interest rate.

The *Truth in Lending Law* makes comparing credit costs simple. This federal law requires that all lenders state their finance charges and interest rates in the same way. This rate is called the *annual percentage rate* or *APR*. An APR is the rate you pay in a single year on the money you borrow. The APR is based on the amount of money you still have to pay back, not the amount of the original loan. In credit language, it is based on the *declining balance* of your loan.

Every loan must also state the finance charge. The *finance charge* is the total dollar amount of interest you must pay on the loan. The amount you borrow is called the *principal* of the loan. You pay back the principal plus the finance charge. The finance charge depends on the APR and the length of the loan. The higher the APR and the longer the period of the loan, the higher the finance charge.

Save Money on Interest—Go Figure

By using your math skills, you can save big bucks on a loan. Let's find out how.

Part I FIGURING SIMPLE INTEREST

First, let's figure some finance charges. The basic formula for figuring out interest is:

I = PRT

I—Interest (Finance charge)
P—Principal
R—Rate (an add-on rate)
T—Time (in years)

In this formula, the rate is an add-on rate with one payment of principal. The principal (amount of loan) and the interest are paid in one lump sum at the maturity date (end of loan period). For example, if you borrowed $2,000 at a 12 percent add-on rate for two years, the interest would be $480 ($480 = $2,000 x .12 x 2). The amount of $2,480 (interest and principal) would be repaid at the end of two years. Now answer these questions:

Questions

1. Gabrielle Daily borrows $1,000 at a 6 percent add-on rate for one year. What is the finance charge?

2. Jesse Candelaria borrows $2,000 at a 10 percent add-on rate for three years. What is the finance charge?

3. Jessica Tate borrows $2,000 at a 10 percent add-on rate for two years. What is the finance charge?

4. Travis Whitaker borrows $2,000 at an 8 percent add-on rate for two years. What is the finance charge?

5. If you want to lower the finance charge, should you shop for a higher or lower interest rate?

   Why?

6. If you want to lower the finance charge, should you pay back the loan more quickly or less quickly?

   Why?

Part II FIGURING MONTHLY PAYMENTS

Most loans are paid back on a monthly basis. Very few are paid back all at once at the maturity value of the loan. The monthly payment is the amount the borrower must pay the lender each month to pay back the loan. The monthly payment covers principal and interest. This is the formula for figuring the monthly payment:

$$\text{MP} = \frac{\text{P} + \text{I}}{\text{N}}$$

MP—Monthly payment

P—Principal of the loan

I—Interest (Figure it as you did in the earlier problems)

N—Number of months the loan is for

For example, you borrow $10,000 at an 8 percent add-on rate for four years.

P = $10,000

I = ($10,000 x .08 x 4) or $3200

$$\text{MP} = \frac{(\$10{,}000 + \$3200)}{48} \text{ or } \$275$$

Questions

1. David Kim borrows $8,000 at an 8 percent add-on rate for two years.

- **What is the interest?**
- **What is the monthly payment?**

2. Maria Torres borrows $8,000 at an 8 percent add-on rate for four years.

- **What is the interest?**
- **What is the monthly payment?**

3. If a borrower takes longer to pay back a loan, what happens to the monthly payment?

4. If a borrower takes longer to pay back a loan, what happens to the interest?

5. What are the costs and benefits of taking longer to pay off a loan?

Part III DETERMINING THE APR

In the past, lenders advertised interest rates in various ways. In some instances, people were paying higher rates than they thought because lenders were figuring the rates differently. Consumers had difficulty shopping for credit because of these variations in figuring rates.

Let's look at a couple of examples to illustrate what was being done. Suppose George secures a $1,200 loan at 10 percent add-on interest for one year that he would pay off (interest and principal) at the end of the year. At the end of the year, he would pay $1,320 to the lender ($1,200 principal with $120 interest). The interest rate that was advertised for this loan was 10 percent.

Now suppose that Sheila secured a $1,200 loan with 10 percent add-on interest paying $110 a month. She would be paying a total of $1,320 as well. Before the Truth in Lending Law, the lender probably would have advertised this loan as a 10 percent interest loan, just like the lender for George's loan. In reality, are both of them paying the same interest rate?

They are certainly paying the same amount of interest, but they are not paying the same rate of interest. Why? In the first situation, the person receiving the loan has the full $1,200 for the entire year. In the second situation, part of the $110 a month is going toward the repayment of the loan. Sheila has less of the loan each month because of the monthly payments.

The Truth in Lending Law was established so that individuals shopping for credit could have a common basis for comparing loans. According to this law, the interest rate must be stated as an Annual Percentage Rate (APR), based on the declining balance of the loan. The Truth in Lending Law also requires that the full amount of finance charges (interest plus other charges) must be indicated to the consumer.

The formula for determining the APR for any loan is:

$$\text{APR} = \frac{2MI}{P(N+1)}$$

M—Number of payments per year
(For monthly payments this is always 12)

I—Interest

P—Principal

N—Total number of payments

Let's figure out the APR for Sheila's loan by first looking at the interest that she pays.

$120 = $1,200 (principal) X .10 (interest rate) X 1 (number of years)

Now let's figure the annual percentage rate using the APR formula .

$$\text{APR} = \frac{2 \times 12 \times \$120}{1{,}200 \times 13} = \frac{2{,}880}{15{,}600} = 18.46\%$$

Notice that the APR for Sheila is much higher than the 10 percent that was probably quoted to her by the lender. If you use the formula for George's loan, you will see that it will come out to 10 percent APR since there was no declining balance on the loan. He always had $1,200 available on the loan.

Questions

Now let's figure some APRs. All these loans are paid back on a monthly basis.

1. **Lisa Rosas borrows $5,000 at a 5 percent add-on rate for one year.**

What is the finance charge?

What is the APR?

2. **Brett Olson borrows $6,000 for three years at a 7 percent add-on rate.**

What is the finance charge?

What is the APR?

3. **What is the relationship of an APR for an add-on rate for a one-payment loan compared to an add-on for a monthly installment loan?**