

## Figuring the True Cost (APR) of Credit

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This publication will help you determine the exact annual percentage rate of a credit transaction.

The federal Truth in Lending law requires lenders to tell you the annual percentage rate (APR) and the total finance charge in dollars when you apply for credit. However, those figures still may not tell the whole story. In some cases, the exact annual percentage rate may not be known until all specifics of the transaction have been decided.

When the creditor tells you the interest rate, you can be sure you are being quoted the true APR and that it is the rate being written into the credit contract by doing some simple calculations. These calculations also allow you to compare rates from different creditors for the best deal.

Convert quoted interest rates to APR by using the following formulas:

### Simple Interest

Use the simple interest rate formula

$$I = PRT$$

where **I** is the dollar amount of interest, **P** is the amount of principal borrowed, **R** is the rate of interest quoted, and **T** is time of the loan in years. When a lender quotes you a simple interest rate of 6 percent on a \$500 loan borrowed for one year, the calculation would be:

$$I = \$500 \times 0.06 \times 1 = \$30$$

But is that the true cost of borrowing?

### Finding the True Effective Cost of Borrowing (APR)

In most instances you won't be using the entire \$500 for the entire year. Let's assume the loan will be paid off in 12 equal monthly installment payments beginning in 30 days. You have full use of the entire \$500 for only the first month. After the first month, the amount you have to use decreases throughout the year. The average monthly balance on the loan is approximately \$250.

To do the calculation to find the true cost of borrowing, you would need to revise the formula,  $I = PRT$  to read  $R = I / PT$ . Then you could find the rate of interest by doing the following:

$$R = 30 / 250 = .12 = 12\%$$

A \$30 interest charge on an average outstanding balance of \$250 is costing you 12 percent a year. In this case the true cost of borrowing or the approximate APR is twice as large as the stated interest rate.

### The Effective Cost of Borrowing (APR)

The finance charge is the amount of money you pay for the use of credit. When lenders state the finance charge, they must include the interest charge and any other fees that are part of the credit transaction. Examples of these other fees include a loan origination fee, any processing fees, premiums on credit life insurance, and any other fee that is a required part of the credit offer.

Use the following formula to determine the true effective cost of borrowing. It also will give the approximate annual percentage rate of interest (APR).

$$APR = 2 \times f \times n / a \times (t+1)$$

where **f** is the amount of finance charge, **n** is the number of payments per year, **a** is the amount to be repaid, and **t** is the total number of payments.

### Simple vs. Effective Interest Rates

To illustrate the use of the effective interest rate formula or the APR, assume you agree to pay \$440 for a washing machine. A down payment of \$40 is made leaving \$400 to be borrowed at a stated interest rate of 10 percent. The loan is to be paid off in 18 equal monthly installments.

The finance charge can be calculated using the **simple interest** rate formula,  $I = PRT$ :

$$I = \$400 \times 0.10 \times 1.5 = \$60$$

You are borrowing \$400 (**P**) for 1.5 years (**T**) and you will owe a \$60 finance charge (**I**). But is that the effective interest rate? To find out, use above **effective interest rate formula**, and assume the number of yearly payments is 12, and the total number of payments is 18. The calculation would look like this:

$$\text{APR} = 2 \times 60 \times 12 / 400 \times (18+1) = 1440 / 8740 = 16.5\%$$

The amount to be repaid includes your \$400 loan plus the \$60 finance charge or \$460.

Let's further assume that the lender requires a **loan application fee** of \$10 and a **processing fee** (credit check) of \$25 in this situation. The annual percentage rate now needs to reflect the increase in the total finance charge from \$60 to \$95. So the calculation would be:

$$\text{APR} = 2 \times 95 \times 12 / 495 \times (18+1) = 2280 / 9405 = 24\%$$

In this example, the lender stated a simple interest rate of 10 percent. Yet you actually are paying an effective APR of 24 percent once you add in the fees and you do not have the use of the full loan for the entire loan period.

### Discounted Loans

Some lenders want their **interest in advance**. They make discounted loans where the finance charge is deducted from the amount you borrow when you take out the loan. If the loan in the previous example where you borrowed \$400 was a discounted one, the lender would subtract the \$95 finance

charge. You would receive only \$305 but you would pay back the total amount borrowed (\$400) in 18 equal monthly payments. The APR is much higher because you would have use of less money.

$$\text{APR} = 2 \times 95 \times 12 / 400 \times (18+1) = 2280 / 7600 = 30\%$$

In addition, you would not have enough money from the loan to buy the washing machine with the discounted loan.

### Why Determine True Cost of Borrowing

You can determine the true cost of borrowing to verify the APR when your payment schedule calls for regularly occurring payments of equal amounts. Remember the lender is required to tell you the effective APR and the total finance charge. To get credit at the least cost, shop in two or three places for the lowest APR and total finance charge.

Compare the cost of credit in terms of time. The longer it takes you to repay a loan the higher your finance charge will be.

### Resources Used in This Publication

Garman, E. T. and Fogue, R. E. (2006). Personal finance (8<sup>th</sup> ed.). Boston, MA: Houghton Mifflin Co.

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