

## Interested in Credit Cards?

Credit cards are readily available to almost anyone today. Look around your class rooms and you'll probably find "opportunities" to apply for VISA, MasterCard, department store cards, Discover Card, .... These cards keep you from having to apply for credit every time you make a purchase. They are very handy, but their convenience can result in long-term debt if you don't understand how the interest is calculated. This is one case where ignorance is not bliss, and a bit of knowledge can save you plenty.

When you charge a purchase on a credit card, you are, of course, borrowing money. Some credit cards charge you interest from the day of purchase, but most have a grace period during which no interest is charged on the amount you borrowed. If the balance is paid in full within this grace period (usually about 25 days), then no additional interest will be charged. But if some of the balance is still unpaid at the end of the grace period, then a relatively high rate of interest is charged. More than just the interest rate must be considered, though, when you choose which card to use. Here's a story from 1990:

I went on an extended trip and was not home when my credit card bills arrived in the mail. I had charged almost identical amounts on two different cards, and, not realizing that the grace period had expired, continued to use the cards for purchases and hotel expenses. I intentionally alternated use of the cards so as to avoid reaching my credit limit on either card. When I returned, I had a second bill from each card company and, even though the total charges on each card differed by less than a dollar and each charged 14.9% interest, one bill was quite a bit larger than the other!

What happened here? How can the finance charge on almost-identical purchases differ for two credit cards that charge the same interest rate? The answer lies in that there are several ways in which credit card companies determine the *balance* on which interest you pay is computed each month. Here are the three methods of computing interest that I have encountered on cards I held since college days.

I. Using the **Average Daily Balance (ADBx) Excluding New Purchases** method, interest is paid only on any balance remaining from the previous month. You get about 25 day's grace before interest starts accruing on new purchases, even if you didn't pay your balance in full. This was the method used on my first credit card and is uncommon today.

II. The **Average Daily Balance (ADBi) Including New Purchases** method is very common in South Carolina. A local bank offered one without a grace period and interest was charged from the day of purchase even if you did not carry a balance. With a grace period, as is more common, this method is very similar to the first (ADBx), with this exception: If any balance remains unpaid from a previous month, that balance is subject to interest. Furthermore, there is no grace period for *new* purchases - interest is charged from the day of purchase.

III. Under the **Two-Cycle Average Daily Balance Including New Purchases** method, as in II above (ADBi), there is no grace period on new purchases if you have a remaining balance. In addition, the grace period for the first month is eliminated *retroactively* and *compound interest* is applied when you fail to pay your bill in full.

**Example:** Suppose you charge a \$300 condo rental bill on August 1 and a \$200 auto repair on September 1. You are sent a bill in September for the August charge, but you are not home to pay it. On your return, you pay your October bill in full. (That is the bill for the period ending September 30.) The annual interest rate is 15% ( $0.15 / 12 = 0.0125$  interest/month). Find the finance charges for each method.

Under the ADB<sub>x</sub> method, you have

No interest on the \$300 charge on the first (September) bill  
and  
Interest on the \$300 charge only on the second bill.

So in October, you pay the principal + one month's interest on the \$300 charge and principal on the \$200 charge =  $\$300 + (\$300)(0.0125) + \$200 = \$503.75$ .

Under the ADB<sub>i</sub> method, you have

No interest on the \$300 charge on the first (September) bill  
and  
Interest on the \$300 charge *and* the \$200 charge on the second bill.

So in October, you pay the principal + one month's interest on the \$300 charge and principal + daily interest on the \$200 charge

$$= \$300 + (\$300)(0.0125) + \$200 + (\$200)(0.0125) = \$506.25.$$

Notice that this can also be calculated as

$$\$300(1+0.0125) + \$200(1 + .0125) = \$506.25, \text{ or } \$500(1+0.0125) = \$506.25.$$

Using the Two Cycle method above, you have

No interest on the \$300 charge on the first (September) bill  
but  
*Compound* interest is applied *retroactively* for the months of August and September on the \$300 charge, and  
Interest is applied to the \$200 charge for each day.

So in October, you pay the principal + two month's compound interest on the \$300 charge and principal + interest on the \$200 charge

$$\begin{aligned} &= \$300(1+0.0125)^2 + \$200(1 + .0125) \\ &= \$510.05. \end{aligned}$$

Some states specify, by law, the method to be used by all banks issuing credit cards. Which of the above methods do you think is preferred by consumer conscious lawmakers? Look at the credit card applications you get in the mail and those in folders on bulletin boards. Which method of determining balance is used by those card companies who target students?

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Assignment: Call a bank or get from a current credit card application a current annual interest rate for a particular card. Do not use one of the "introductory" rates that expire after a period of card use. Using that interest rate, solve the following problem and write a report on a word processor detailing the card assumed, the interest rate, and your solution. You should include a printout of your spread sheet pages or the details of your calculations on the TI-82/3. Here's the problem:

On May 1st, you charged a \$450 doctor bill for the ankle you sprained while hiking. You also charged the \$50 crutches you got at the drug store that day. On June 1st, you charged your \$400 plane ticket needed to get home for the summer. On June 3rd, your bill came in the mail for the month of May, and offered you the option of paying nothing for the month since your "credit management has been exemplary"- and reminding you that if you choose to pay nothing, your interest will continue to be charged as in your cardholder's contract.

Part 1: If you decide to accept the company's generosity, and pay the whole bill in July, what will the *decision to delay payment* cost you? Solve the problem for each of the three methods of determining balance.

Part 2: Suppose you decide to pay \$100 per month, starting on July 3rd (the day of arrival of the next bill), and to pay nothing in June. It will take you a while to pay the whole bill. Construct, for each method of determining the balance, an amortization table for the period of time until the total bill is paid. Use a spreadsheet. Your report should contain three tables, each with headings and first lines looking like the one below. You should fill in the \*'s and the rest of the table.

Bill Number	Amount Paid	Interest Paid	Principal Paid	Balance before Interest is added	Balance with Interest added
0(May)	\$0.00	\$0.00	\$0.00	\$500	\$500
1(June)	\$0.00	\$0.00	\$0.00	*	*
2	\$100.00	*	*	*	*
*	*	*	*	*	*

Of course, the Interest column entry plus the Principal column entry should equal the Amount column entry of \$100. Continue your table until the balance is zero (or less). Make sure your report includes a short summary, comparing and contrasting the different methods.

[Other features of credit card contracts are interesting. Some credit companies charge an annual fee for the use of the card. Some have a minimum finance charge. These features must also be considered when choosing a card.]