

An Introduction to Car Loan Interest Charges

Ch'ng Pei Eng¹, Ng Set Foong², Chew Yee Ming³ and Muniroh bt Hamat⁴.
chnge@uitm.edu.my, ngsetfoong061@uitm.edu.my, chewyeeming@uitm.edu.my,
muniroh@uitm.edu.my

^{1,3,4}Jabatan Sains Komputer & Matematik (JSKM), Universiti Teknologi MARA Cawangan Pulau
Pinang, Malaysia

²Fakulti Sains Komputer & Matematik (FSKM), Universiti Teknologi MARA Cawangan Johor,
Malaysia

Introduction

Many people love cars, but the price of a car is usually not cheap, so asking a bank loan is the easiest way to solve this financial problem. Do you know that money is not free to borrow? There is a cost to pay when one borrow money! Interest is the name for the cost of borrowing money. In this paper, we would like to share how the interest is being calculate for a car loan, how to determine the monthly payment for a car loan, as well as the total amount paid over a period of car loan term for the car. This would help the reader to make a smart decision when taking a car loan in future.

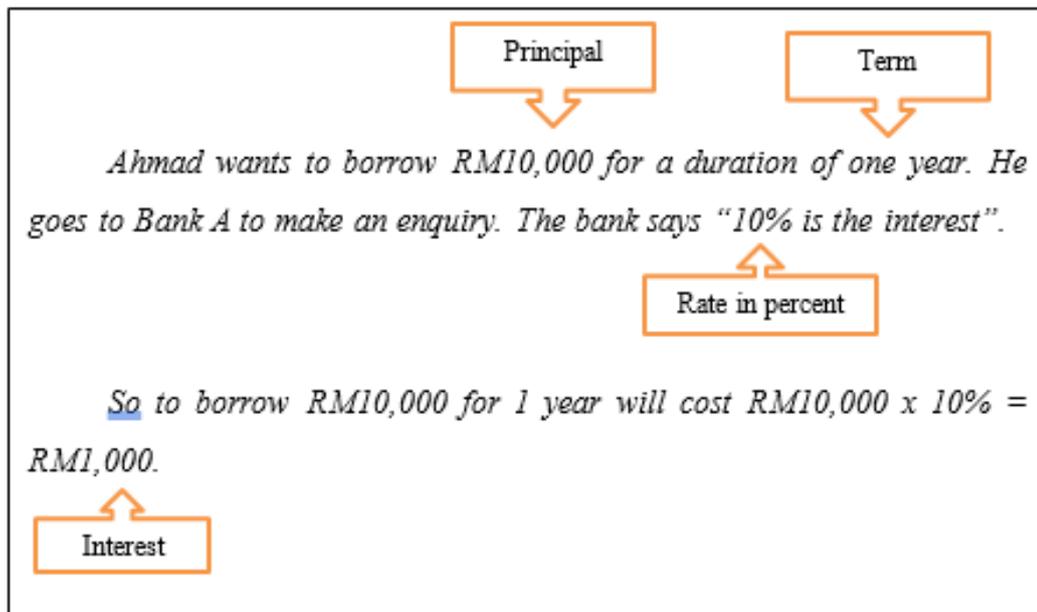
Definition of terms

In this section, we would like to introduce the reader the special terms used when borrowing money. Let's consider the following case (a simple full year loan):

Ahmad wants to borrow RM10,000 for a duration of one year. He goes to Bank A to make an enquiry. The bank says "10% is the interest". So to borrow RM10,000 for 1 year will cost $RM10,000 \times 10\% = RM1,000$.

If Ahmad agrees to the condition offered by the bank and he will brings back RM10,000 now. One year later, of course he has to pay back the original RM10,000 plus the interest RM1,000 and the total to be paid up to the bank is RM11,000.

Ahmad is the **Borrower**, the Bank A is the **Lender**. The amount of money borrowed is the **Principal** of the loan. The duration of the loan in years is called **Term**. The percent (per year) of the amount borrowed is stated in **Rate per annum**. The cost to pay when borrowed money is the **Interest** charged.



Simple Interest

We can use the following formula to calculate the interest charged on loan:

$$\text{Interest} = \text{Principal} \times \text{Rate} \times \text{Term}.$$

Let's say Ahmad wanted to borrow the money (RM10,000) for 2 years. If the bank charges "Simple interest", then Ahmad just pays another 10% for the extra year. Ahmad pays the interest of $(\text{RM}10,000 \times 10\%) \times 2$ years. Then he just has to pay the same amount of interest every year.

Car Loans Interest

If you plan to buy a car by taking a car loan, then it is better to fully understand how interest rate charges work. Besides that, most Malaysian banks require car buyer makes a minimum down payment of at least 10% of the total car value for a new car or 20% for a used car (Surendra, 2015).

The interest calculation for car loans usually applies a flat interest rate (CompareHero.my, October 12, 2018), such that the amount of interest charged is fixed upon the principal. For example:

Ahmad wants to buy a new car, the price of the car is RM77,000. He decides to make a down payment 10% of the price of the car, and the rest he will apply a car loan. Bank A offers him 3.4% interest rate. Ahmad is given a choice on the duration of the loan (5-year, 7-year, or 9-year).

Now, Ahmad wishes to find out the total interest charged for a 9-year term loan, a 7-year term loan and a 5-year term loan. Do you know how much is the total interest charged for each loan term?

Here, the price of the car is RM77,000. The down payment is $RM77,000 \times 10\% = RM7,000$. Therefore, the loan amount for Ahmad is RM70,000 ($RM77,000 - RM7,000$).

The following is the comparison of the interest calculations based on the respective terms.

A 9-year term

Based on the simple interest formula, the calculation for the total interest paid over 9 years will be as follows:

$$\begin{aligned}\text{Interest} &= \text{Principal} \times \text{Rate} \times \text{Term} \\ &= 70,000 \times 3.4\% \times 9 \text{ years} \\ &= RM21,420\end{aligned}$$

Total amount need to repay is $RM70,000 + RM21,420 = RM91,420$

Monthly payment for Ahmad is total amount need to repay divide over a period of 108 months = $RM91,420 \div 108 = RM846.48$

Total amount paid for the car by Ahmad after 9 years is $RM 7,000 + RM 70,000 + RM 21,420 = RM98,420$.

A 7-year term

Based on the simple interest formula, the calculation for the total interest paid over 7 years will be as follows:

$$\begin{aligned}\text{Interest} &= \text{Principal} \times \text{Rate} \times \text{Term} \\ &= 70,000 \times 3.4\% \times 7 \text{ years} \\ &= RM16,660\end{aligned}$$

Total amount need to repay is $RM70,000 + RM16,660 = RM86,660$.

Monthly payment for Ahmad is total amount need to repay divide over a period of 84 months = $RM86,660 \div 84 = RM1031.66$

Total amount paid for the car by Ahmad after 7 years is $RM 7,000 + RM 70,000 + RM 16,660 = RM93,660$.

A 5-year term

Based on the simple interest formula, the calculation for the total interest paid over 5 years will be as follows:

$$\begin{aligned}\text{Interest} &= \text{Principal} \times \text{Rate} \times \text{Term} \\ &= 70,000 \times 3.4\% \times 5 \text{ years} \\ &= RM11,900\end{aligned}$$

Total amounts need to repay is $RM70,000 + RM11,900 = RM81,900$.

Monthly payment for Ahmad is total amount need to repay divide over a period of 60 months = $RM81,900 \div 60 = RM1365$.

Total amount paid for the car by Ahmad after 5 years is $RM 7,000 + RM 70,000 + RM 11,900 = RM88,900$.

Table 1 depicts a summary of a comparison of the monthly payment and the total amount paid for three different term loan, we want to ask the reader, “*if you are Ahmad, which loan term are you going to choose?*” The decision is yours.

Table 1: A comparison of the monthly payment and the total amount paid for three different term loan.

Term	Monthly Payment	Total amount paid for a car with selling price RM77,000
9-year	RM846.48	RM98,420
7-year	RM1031.66	RM93,660
5-year	RM1365	RM88,900

Final Words

Some borrowers just consider the monthly payment amount when making a choice on which term loan to take, but it is advisable to look at the total amount paid for a car also. In this paper, it is clearly showing that the shorter the loan term the less amount the borrower is actually paying back for the same car!

References:

- CompareHero.my. (October 12, 2018). Why Car Loan Interest Charges Are Actually Pricier Than What it Seems? Retrieved from: <https://www.comparehero.my/personal-loan/articles/heres-how-car-loans-work-and-why-interest-charges-are-higher-than-you-think>
- Surendra, E. (July 28, 2015). Top Financial Considerations When Buying A Car. iMoney Malaysia. Retrieved from: <https://www.imoney.my/articles/top-financial-considerations-when-buying-a-car>