***Second: simple interest calculation methods***

In calculating simple interest, several methods are used, perhaps the most important of which are:

1- Commercial interest and correct (real) interest: The interest calculation using the commercial method is based on the assumption that the year includes 360 days and the month has 30 days, and its relationship is the one previously mentioned. As for the real interest, it is calculated on the basis of the days of the civil year, which is estimated at 365 days, and that the number of days The months are calculated correctly, i.e. January 31, February 28, March 31, April 30, ....

It should be noted that the leap year includes 366 days, instead of the regular year, which includes 365 days, and this is because the month of February reaches 29 days.

Therefore, the correct interest relationship in the case of an ordinary year is as follows:

As for the leap year:

Example 1: A person borrowed 1,500 DZD, for a period of 4 months, at an annual interest rate of 12%.

- Calculate the interest paid by the correct and commercial methods?

In the commercial way:

I\_C=c×t×n/360=1500×0.12×120/360=60DN

- in the right way:

I\_r=C×t×n/365=1500×0.12×120/365=59.17DN

It is noted that when we adopted the correct method for calculating interest, we assumed that the month includes 30 days, and this is due to the lack of details about the beginning and end of the borrowing date.

Example 2: On January 01, 2008, an amount of 2000 DZD was invested until April 30 of the same year, at an interest rate of 8%. Calculate the interest value using the commercial and correct methods.

Solution: First we have to calculate the employment period in days:

Avr Mar Fév Jan

=120 30 31 29 30 n

The month of January includes 31 days, but one of the days must be omitted from the total period of employment, whether the day of employment or the last day (the date of withdrawal or the date of interest calculation), and in our example we did not calculate the first day.

Commercial interest:

I\_c=C×t×n/360=2000×0.08×120/360=53.33DN

Benefit the right way:

I\_r=C×t×n/366=2000×0.08×120/366=52.46 DN

Important Notes:

- In the event that there is a specific period of time (a specific time interval) between the date of employment (lending) and the date of interest calculation, we adopt the days in a realistic manner, whether when applying the commercial or correct method, while the denominator of the fraction must be taken into account as required by each method.

- If it happens that the time interval is between days or months in a normal year and days or months in a leap year (for example: from December 2007 to March 2008), then we depend - when applying the correct method - in the denominator the number of days in a normal year, i.e. 355 instead of 366 because the normal year is originally (repeated 3 times) and the leap year is the exception.

- If it is not explicitly stipulated to apply the correct method for calculating simple interest, then the principle is to use the commercial method because it is common in bank transactions.

\* The relationship between commercial interest and validity:

The relationship between commercial interest and proper interest can be derived by dividing the first by the second:

I\_(r=)C×t×n/365; I\_c=C×t×n/360

Dividing \_c by I\_r we get:

I\_c/I\_r =(c×t×n/360)/(c×t×n/365)=(c×t×n)/360×365/(c×t×n)=365/360=73/ 72

I\_c/I\_r = 73/72 □(⇒┴ 73/72) I\_r=(1+1/72) I\_r

From the previous relationship, we conclude that the commercial interest = the correct interest + 1/72 the correct interest. In contrast, we find:

I\_c/I\_r = 73/72 □(⇒┴ ) I\_r=72/73 I\_c=(1-1/73) I\_c

i.e. correct interest = trade interest -1/73 trade interest.

Example: Calculate the correct interest if you know that the commercial interest is 100 DZD.

I\_r=72/73 I\_c=72/73×100=98.63DA

Through the above, it is clear that the commercial interest is greater than the correct interest, and the difference lies in only five or six days.

2- Al-Nimr and Al-Qasim method for calculating simple interest:

This method changes the simple interest equation, where the numerator includes the product of multiplying the amount by the period and we call it the tiger, while the denominator is expressed by the product of dividing the days of the year (306 days) by the interest rate, and we call it the denominator.

The tiger is denoted by the symbol N and the denominator by the symbol D, where:

Example: Calculate, using the tiger and denominator method, the interest earned on investing an amount of 8000 DZD for a period of 70 days, at a rate of 6%.

We have the denominator = 360÷0.06= 6000

Tiger = 8000 x 70 = 56000

Therefore, by applying the previous relation, we find:

I=N/D=(c×n)/(360/t)=(8000×70)/6000=93.33DN

It is noted that the application of the tiger and denominator method helps to shorten the calculations, especially if we have several amounts and the interest rate is uniform, as it requires calculating the denominator only once.

Accordingly, the interest calculation of several amounts will be according to the following relationship: