

Why Isn't Interest Included in Flow of Expenditures of Investment Project?

by ĐINH NGỌC TRƯỜNG

Interest is a sum of money the company pays a creditor periodically. According to the total investment point of view (TIPV), however, the interest isn't included in the project's expenditure flow because of the following reasons:

Firstly, to separate decision on investment from decision on financing, the interest shouldn't be included in the project expenditure.

The cashflow (CF) including the interest according to the TIPV is the flow of cash from business activities and investment (not including financial activities) and can be expressed in the following formula:

$CF = \text{Sales in cash} - \text{Cost in cash (not including the interest)} - \text{tax (1)}$

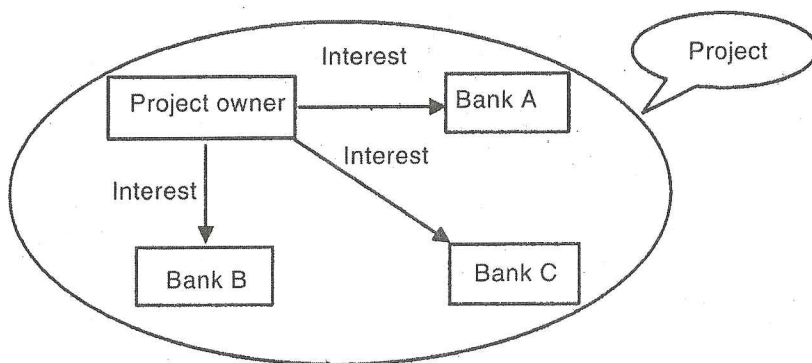
If the cost in cash includes the interest, the cash flow of the project is:

$CF = (1) - \text{interest (2)}$

The (2) equation shows that, if the interest is included, the CF is dependent on the interest. Thus, if the company accept big loan, the interest will be high, which reduces the CF and affects efficiency of the project. And as a result, the efficiency will affect the banker's decision on financing the project. To avoid this effect, the banker usually put aside the loan capital when evaluating the efficiency of the project.

Secondly, TIPV advocates examining the project efficiency without paying attention to sources of capital. Any parties can take part in the projects and receive benefits brought about by the project based on their contributions. When all

parties put their money, machines, materials or technologies, in the project, they become parts of the project. When the projects owner pay interest to these parties, the money changes hands within the project and doesn't go out of the project. Thus, paying interest is only a kind of redistribution of benefit among participants. That is why the interest payment is not considered as an expenditure of the project. This argument is presented in the following figure:



As shown in the figure, the project is financed by four parties: Project owner, Bank A, Bank B and Bank C (the number of parties may be bigger or smaller), and the interest payment only goes from the project owner to the three banks, and not run to the outside. In the project, the owner participates by putting his capital and acts as the owner, and the banks take part by supplying loans to the owners. Benefit from the project is distributed among them in form of interest payments (for banks) or profit (for the owner).

Thirdly, the interest is included in the discount rate of the project so we don't put it aside to avoid deducting it twice. This argument is illustrated in the following example.

A project has the following information:

- Total investment: 160
- Loan capital: 120 (75%); and interest rate is 10% a year
- Owner's capital: 40 (25%), the required profitability ratio is 20% a year.

The cash flow including the interest payment of the project is as follows:

Year	0	1	2
CF	-160	67.5	151.875

Discount rate (WACC) is $10\% \times 75\% + 20\% \times 25\% = 12.5\%$ /year.

$$NPV = -160 + \frac{67.5}{(1 + 12.5\%)^1} + \frac{151.875}{(1 + 12.5\%)^2} = 20$$

As we know, participants in the project will receive part of benefits from the cashflow originating from the project. Namely, the bankers after supplying loans to the project, they can receive the principal and interest payment from the project cashflow. As for the project owner, after putting his money in the project he can receive his money, cost of capital, and some profit from the project. This sum is the project NPV.

Thus, all debts, cost of debt, owner's capital, cost of owner's capital and profit from the project will be retrieved from the project cashflow. Process of repaying these sums relies on the cashflow generated by the project and is presented in the following table.

Year	0	1	2
Initial investment		160	112.5
Payment for cost of capital to banks and project owner (discount rate is 12.5%)		20.0	14.0625
Repayment of principal to banks and owner		47.50	112.5
Investment at the end	160	112.50	0

The cashflow in the year 1 is 67.5. Of this sum, 20 is used for paying interest and cost of owner's capital, and 47.5 for paying the principal to banks

and project owner. Similarly, the cashflow of the year 2 is 151.875 (14.0625 for interest and cost of capital, and 112.5 for principal) and the profit is 25.3125 (151.875 - 14.0625 - 112.5)

Present value of the cashflow left in the year 2 is:

$$\frac{25.3125}{(1 + 12.5\%)^2} = 20$$

We see that the present value of the cashflow of the year 2 is equal to the project NPV. This means that the cashflow from the project is distributed among participants (banks and project owner). Bankers will receive principal and interest first, and project owner will take back his capital and cost of capital later. The surplus after covering all of these sums is the profit for the project owner. This is also the project NPV - the leading factor for decision on investment.

These analyses show that the interest is deducted from the cashflow when principal and cost of capital are paid back to the bankers and project owner. In other words, the interest is included in the discount rate. Moreover, if the interest is deducted from the cash flow, the present value of the cash flow left in the year 2 is smaller than the NPV of the project. If the interest is deducted from the project cash flow, it will be deducted twice. That is why we shouldn't include the interest in the cash flow with a view to avoiding double deduction, which may lead to wrong calculation of the NPV.

The first and second explanations are qualitative while the third one is quantitative.

In short, the interest shouldn't be included in the project cash flow when evaluating the project financial efficiency because it may distort results of the evaluation and lead to wrong decision on investment ■

Reference

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