

Capital Budgeting: a Tax Shields' "Mirage"?

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Abstract. *The mainstream in Finance studies recognizes the impact of tax shields on capital budgeting. This study offers some evidences regarding a bias in direct investment projects valuation in the case of taking into account of the allowance of recovery of the losses recorded in the past financial exercises from future profits as long as the classical indicators (e.g., Net Present Value) are used. Also, this tax regime seems to favour the adoption of less-performer projects by less-performer companies, as long as these projects should be otherwise rejected by a performer company.*

Keywords: capital budgeting; tax shields; recovery of losses; net present value; cash flows.

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1. Introduction

At a macroeconomic level, taxes are acknowledged by many experts as a tool that can be used in order to have an influence on economy or even on society (Văcărel et al., 2007, Obreja Brașoveanu, Brașoveanu, 2008). However, not always this instrument achieves this goal (Dragotă, Dragotă, Țătu, Țătu, 2009).

At this moment, many countries have adopted the principle of allowing the recovery of losses from the profits supposed to be recorded in the following financial exercises. For example, in the European Union, the allowance of recovery of tax loss is stipulated in states such as: Austria, Belgium, France, Finland, Lithuania, Luxembourg, Netherlands, Romania, Spain, Sweden, United Kingdom (www.europa.eu). The main explanation for this regulation is to encourage the economic growth. A support for companies that record losses can be accepted as long as these companies will determine economic growth in the future.

The analysis of the impact of tax regulations on the corporate financial policies is a permanent presence in financial theory. However, emphasis was placed on the tax impact on financing and dividend policies, proof thereof being made by the long list of articles published in this field, initiated by Modigliani and Miller (1963) regarding financial structure, and Miller and Modigliani (1961) on the subject of dividend policy.

Concerning capital budgeting, most finance studies take into account the impact of taxes on the performance of investment projects or, more precisely, the impact of tax shields on the cash flows generated by the investments project. For example, it is recognized in this context the impact of tax shields resulting from debt, which can improve the performance of an investment project. Mainly, the basic idea behind the concept of tax shields is that some projects financed by 100% equity must be rejected (net present value⁽¹⁾, $NPV < 0$), while the same projects, but financed by a mix of equity and debt, due to tax shields, can be adopted ($NPV > 0$) (Modigliani, Miller 1963, Ross, Westerfield, Jaffe, 1999). In fact, this entire judgement is based on the idea to correct the cash flows produced by the investment project with tax shields due to indebtedness.

Similarly, it can be stated that a company can benefit from tax shields resulting from recovery of losses recorded in the previous financial years. By allowing the deduction of losses from taxable profit recorded by companies, the cash flows generated by these companies will be also affected. Regarding the

analysed investment project, this tax regulation will affect the cash flows and, also, the discount rate.

Somehow, this issue will violate one generally accepted principle in investment projects valuation, respectively to assess the project *in its individuality*, i.e. to take into account only its independent performance, and not the general performance of the company that analyse the project (Ross, Westerfield, Jaffe, 1999). However, the companies that have recorded financial losses in the previous years will be able to increase the level of their cash flows by adding the allowed recovery of financial loss. We will emphasize that this regulation promotes the adoption of relatively unproductive projects by the companies that benefit from this tax facility. Moreover, some direct investment projects that otherwise would be rejected (if they were analyzed independently, by a company that does not benefit of this facility) may become attractive for these non-profitable companies.

The main purpose of this study is to highlight the limits of the classical indicators of investment projects valuation for the companies that have the right to recover tax losses. Practically, these indicators are unable to provide accurate information necessary for taking decisions based on the valuation of direct investment projects, and have to be analysed cautiously.

The paper may be useful to decision makers involved in the analysis of investment projects, but also can provide some ideas to tax regulators. The remaining part of the study is structured as follows. In Section 2 it will be presented the case of the valuation of investment projects in the absence and in the presence of the interference given by the possibility of recovery of tax losses recorded in the previous years. Section 3 concludes the study.

2. Valuation of investment projects as long as the recovery of losses from previous years is allowed

General practice in corporate finance is to take account of fiscal issues in the estimation of the cash flows generated by the investment project. The forecast of income tax will be done based on the (expected) tax rate and on forecasted taxable profit. Regarding the determination of income tax for a negative taxable result (loss), two possibilities are accepted: a) to apply the tax rate on loss, which will produce a negative tax – or a current tax shields. In this approach, it is assumed that the investment project is part of the company's investment portfolio, so the loss will determine a lower taxable profit for the company at the present moment. Thus, the company will have to pay a lower

income tax comparative to the case in which the project would not be adopted; b) to consider the zero income tax, but to carryover the actual loss in the next years, so that the future tax profits will be lower – this is equivalent to a future tax shields. This option assumes that the investment project is considered independent of the company's activity or that the company has an investment portfolio consisting only in this project (Dragotă, Ciobanu, Obreja, Dragotă, 2003, vol. II, p. 49). In other words, the literature stresses the possibility of recovery of losses, implying the reduction in the tax payments in subsequent financial years, but also emphasizes the valuation of investment projects in its individuality.

Anyway, a financial indicator has to express something for his user. For instance, NPV has to eloquently explain if a project should be accepted or not, in accordance with the principle of “maximization of the shareholders’ wealth”, which is stipulated in the main stream of financial literature (Ross, Westerfield, Jaffe, 1999).

Although the stated purpose of corporate finance is to maximize shareholder wealth, which would translate to the exclusive adoption of projects that determine a maximum (positive, to the limit) NPV (Ross, Westerfield, Jaffe, 1999), managers can be more inclined for holding the financial resources, as a measure of discretion in decision making, prestige (achieved in contemporary organizations through access to the highest volume of money), etc. This phenomenon was highlighted even in classical papers (Cyert, March, 1963, Jensen, Meckling, 1976, Jensen, 1986). Moreover, in a more recent study, Loderer, Roth Waelchli and Joerg (2010) show that most managers of companies in the world do not mention the interest for shareholders in their statements on company goals. Regarding the investment policy of companies, this may be translated into a highest allocation of funds for financing investment projects, even these project are not so performative.

One example, extremely simplified, will express the phenomenon. Let’s consider a project that generates a number of annual cash flows (CF_t) for a period of n years (for simplicity, we assume a zero residual value). By hypothesis, in the entire study, we assume that the projects are financed entirely from equity and the rate of return required by investors is k . Project cost is I_0 . Net present value of the project is:

$$NPV = -I_0 + \sum_{t=1}^n \frac{CF_t}{(1+k)^t} \quad (1)$$

The project is acceptable if and only if $NPV > 0$, respectively:

$$\sum_{t=1}^n \frac{CF_t}{(1+k)^t} > I_0 \quad (2)$$

It may be noticed that the investment project valuation has to be done independently of the company that analyze it, given that the only key variables are the cash flows generated by the project (differences between cash inflows and cash outflows arising from the project), the rate of return required by investors and the project cost, variables determined by the expected conditions related to the project. Among these determinants it can be mentioned the payment of the income tax, calculated also on the basis of project performance. It can be stressed that this level of income tax will not be affected by the overall performance of the company, but only relates to the project performance.

If we take into account the possibility of recovery of tax losses previously recorded by the company (or even recorded simultaneously with the investment project), an artificial increase in cash flows to the company level can be induced. It is obvious that this phenomenon creates a relatively "mirage", investment projects performance appearing to be less attractive for performing companies than in the case of non-performing companies. In addition, a system based on the growth of certain expenditures can stimulate both the lack of performance in carrying costs (such an unjustified increase of them), and an alteration of performance indicators of investment projects, especially if one takes into account the agency problems present at company level.

Here, it has to be considered one important distinction between tax shields due to indebtedness and the ones due to the allowance for losses recovery. In the first case, the financial structure for financing the project is determining the tax shields. Here, the principle of direct investment project valuation in its individuality is applied. However, in the second case, an impact of losses from past projects (with no connection with the analysed project) can interfere in the project valuation, so this principle is not applied anymore.

To exemplify this phenomenon, we start from a simple numerical case, but that can be easily generalized. Let consider two companies, A and B, of equal market value, V_0 , identical in all respects. For simplicity, we assume that these two companies are non-levered for the entire period of analysis and that all their activity is quantified as a single investment project.

As such, we assume that each of these two companies adopted one single investment project. The company A has adopted a project that has produced

profit, while company B has adopted a project that has generated tax losses. The life time of these two projects was identical, and both projects are currently completing. Although market values of the two companies were originally identical, currently they are different. For simplicity, we assume that the life time of these two projects was one year. This simplification does not change the main conclusions, while what having effect is the existence/absence of tax shields. In normal economic conditions, we have to impose the condition that the tax losses to do not exceed the net assets of the company, so as not to trigger bankruptcy proceedings⁽²⁾.

Currently, company A can not benefit from the right to recover losses. Also, company B has the right to recover a tax loss of 500 monetary units (hereafter, m.u.). Each company analyzes the adoption of an investment project, with equal cost and the same levels for resulting expected cash flows. Again, for reasons of simplicity, we assume that the investment project life time is limited to one year, and the cash flow from the first year is including the residual value⁽³⁾.

The investment project requires an initial investment of 600 m.u., and the expected cash flow is 650 m.u. We consider a discount rate of project investment of 10%, both for company A and for company B⁽⁴⁾.

For the company A, the NPV is:

$$NPV^A = -I_0 + \sum_{t=1}^n \frac{CF_t}{(1+k)^t} = -600 + \frac{650}{1+0.1} = -9.09 \text{ m.u.} \quad (3)$$

For the company B, if the recovery loss is not considered, NPV will be equal, respectively:

$$NPV^B = -I_0 + \sum_{t=1}^n \frac{CF_t}{(1+k)^t} = -600 + \frac{650}{1+0.1} = -9.09 \text{ m.u.} \quad (4)$$

The analysis of the investment project shows a negative NPV for both companies. Accordingly, under the principles of assessment of investment projects, the project should be rejected by both companies.

The purpose of financial indicators is to provide useful information for management decisions, in this case regarding adopting or rejecting an investment project. In this case, because of the interference induced by allowing recovery of losses, NPV is not recommended. We stress that this does not mean

challenging the classical indicators of capital budgeting for normal circumstances of business activities, but only in these restrictive conditions.

In the case of company B, due to the influence of previous activity recovery loss, we can calculate an indicator (noted here NPV*):

$$NPV^{B*} = -I_0 + \sum_{t=1}^n \frac{CF_t + TS_t}{(1 + k \times \delta)^t} \quad (5)$$

In this equation, the cash flow from equation (4) was corrected in order to take into account the tax shield, TS_t . Also, the usual discount rate (k) has to be corrected in order to take into account the impact of tax shields. We preferred a correction factor, δ , with $\delta \in (0, 1]$, where $\delta = 1$ reflects a zero tax shield, and $\delta = 0$ reflects a 100% income tax rate. By this correction, it is taken into account the coherence between the cash flow (this one has to take into account the tax shield) and the discount rate (this one has to take into account this tax shield, too). There is a logical relationship between the cash flows and the discount rates: as long as the company can benefit from the right to reduce the taxable income, the cost of capital will decrease. We preferred this formalization instead of classical $(1 - \tau)$, where τ is the income tax rate, because loss can be recovered by profits (positive incomes) at different future moments, so the relationship between tax rate and cash flows is not stable.

For the numerical example, supposing $\delta = 0.9$, the corrected NPV is ⁽⁵⁾, ⁽⁶⁾:

$$NPV^{B*} = -I_0 + \sum_{t=1}^n \frac{CF_t + TS_t}{(1 + k \times \delta)^t} = -600 + \frac{650 + 500 \times 16\%}{1 + 0.1 \times 0.9} = 69.72 \text{ m.u.} \quad (6)$$

As long as company B benefits from a cash flow potential that can be materialized only in the case of the adoption of the project (respectively, the tax shield, TS_t), it is most likely to adopt the investment decision. It can be noticed also that, in this case, classical NPV does not offer the correct information for the management. It should also be noted that the adoption of the investment project is recommended for this company, because otherwise it would not be able to recover the losses from the previous years.

Seemingly, it can be argued that this reduction in taxable income would be negligible if the multi-periodic case will be analysed. In fact, this is not so important as long as we compare two companies, of which only one benefits by the right to recovery losses. In other words, let suppose an investor analyses an

investment project in two scenarios: (i) establish a new company; (ii) buy an old company, which has the right to recover losses. In this case, it seems to be obvious that the second choice is better.

3. Conclusions

The recovery of losses creates a relatively “mirage”. Using the classical net present value criterion, the performative companies will reject some project (less performative), but some less performative companies could accept the same projects! Furthermore, this tax regulation encourages the adoption of non-performing projects by non-performing businesses, which would be rejected if the business would be performer.

For the financial analysts, the effects of the allowance for recovery of losses have to be taken into account. These can change the normal verdict regarding recommendation for adoption or rejecting an investment project based on NPV criterion. Moreover, the classical principle of the valuation of the investment project independently by the adopting company has to be used cautiously.

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Notes

- (1) Throughout the entire study, the references to the capital budgeting decisions are based on the net present value (NPV) criterion. Of course, all these considerations can be easily generalized to any other indicator used in capital budgeting analysis – internal rate of return, modified internal rate of return, payback period, etc.
- (2) Even this condition is questionable in certain situations. For example, in Romania, some companies have recorded levels of negative equity, but are not in bankruptcy proceedings.
- (3) Normally, this assumption does not change the conclusions of the study. One can assume that the projects will be sold on the market at prices reflecting market expectations regarding the future performance of the project. As long as the market where this transaction is carried out tends towards efficiency, it will not appear significant problems. Moreover, under normal conditions, even if the market is not efficient, the best prediction made at this time for the expected resale price of the project over one year is its intrinsic value. For Romanian capital market, see tests of informational efficiency in Dragotă and Mitrică (2004), Pele and Voineagu (2008), and Dragotă, Stoian, Pele, Mitrică and Bensafta (2009).
- (4) This assumption can be considered questionable, even the projects are identical. It can be considered a different discount rate for these two projects. This difference can be explained by the higher risk expected by the investors in Company B. Indeed, the investors in Company B can anticipate a higher operational risk, due to the lower past performance of this company. Anyway, this assumption does not change the logic of the demonstration as long as the numerical result still holds even if there are used different discount rates (e.g., 10% for A and 20% for B).
- (5) In the case of a higher discount rate (let it be 20%) for the company B, if the recovery loss is not considered, NPV is:

$$NPV^B = -I_0 + \sum_{t=1}^n \frac{CF_t}{(1+k)^t} = -600 + \frac{650}{1+0.2} = -58.33 \text{ m.u.}$$

As observed, NPV for company B may be lower, plausible as this seems to present a greater risk from the investors' point of view.

For the numerical example, supposing $\delta = 0.9$, the corrected NPV is:

$$NPV^{B*} = -I_0 + \sum_{t=1}^n \frac{CF_t + TS_t}{(1+k \times \delta)^t} = -600 + \frac{650 + 500 \times 16\%}{1 + 0.2 \times 0.9} = 18.64 \text{ m.u.}$$

- (6) To highlight the impact of the tax shield given by the allowance of recoverable loss, we have considered an income tax rate of 16%, applied in some countries (e.g., in Hungary and Romania).

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