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INFLUENCE OF TAXATION ON INVESTMENT DECISIONS BY ENTREPRENEURS

Renata Burchart, Henryk Lelusz

Department of Accounting
University of Warmia and Mazury in Olsztyn

"The tax burden is not the given value, determined by the environment of the enterprise, but rather the value that can be influenced by development or establishment of specific structures".

(KUDERT, JAMROŻY, 2007, p. 17)

K e y w o r d s: taxation and investment decisions, net present value before taxation method, net present value after taxation method, linear and digressive depreciation method, taxation paradox.

A b s t r a c t

The example presented in the paper explains operation of the phenomenon known in the literature as the "taxation paradox" that means that the net present value of the investment after considering taxation is higher than the net present value after taxation or the other way round. The aim is to present that dismissing the taxation aspects in the decision taking processes may result in inappropriate choices or lead to resignation from a profitable investment project by investors.

WPŁYW OPODATKOWANIA NA DECYZJE INWESTYCYJNE PRZEDSIĘBIORCÓW

Renata Burchart, Henryk Lelusz

Katedra Rachunkowości
Uniwersytet Warmińsko-Mazurski w Olsztynie

S ł o w a k l u c z o w e: opodatkowanie a decyzje inwestycyjne, metoda wartości bieżącej netto przed opodatkowaniem, metoda wartości bieżącej netto po opodatkowaniu, liniowa i degresywna metoda amortyzacji, paradoks podatkowy.

A b s t r a k t

Na przykładzie zaprezentowanym w artykule wyjaśniono funkcjonowanie zjawiska znanego w literaturze jako „paradoks podatkowy", który polega na tym, że wartość bieżąca netto inwestycji po uwzględnieniu opodatkowania jest wyższa niż wartość bieżąca netto przed opodatkowaniem lub odwrotnie. Celem badań było pokazanie, że pominięcie aspektów podatkowych w procesach decyzyjnych może skutkować nietrafionymi wyborami lub doprowadzić do zrezygnowania przez inwestorów z rentownego przedsięwzięcia inwestycyjnego.

Introduction

Taxes represent pecuniary services to the benefit of the State Treasury or territorial government based on the tax Act that in their nature are public-legal, free of charges, compulsory, not reimbursable and unilateral. Three basic economic consequences of taxation can be identified:

1) Consequences concerning liquidity. Tax payments of direct taxes, first of all the income taxes, have basically negative influence on the financial liquidity of enterprises. However, as concerns the indirect taxes, i.e. the VAT and excise tax, the straight opinion cannot be formulated. According to the conceptual assumption, the indirect taxes stipulate passing the tax burden upon the consumer. If, however, payment by the consumer for, for example consulting services, takes place after the date of emergence of the tax duty then we can talk about the negative influence of the VAT on the financial liquidity.

2) Consequences concerning the property. Taxes also have negative effect on the entrepreneur's property. Decreasing the value of property results, among others, from charging the entrepreneurs with property taxes (real property tax) and income taxes (capital companies – corporate income tax, partnerships – personal income tax).

3) Organisational consequences. They can be considered at two levels. The first concerns projects that assure timely performance of tax liabilities (maintaining the ledgers, drafting the tax declarations and returns, passing the tax information, transfer of withholding taxes). The second level concerns considering taxes in the management process, which also requires creating adequate organisational conditions (establishment by the entrepreneur of own tax department or using the services of an external tax consultants).

For small and medium enterprises in particular it is unprofitable to maintain their own financial accounting services (costs of employment, costs of work environment organisation, office equipment, maintaining computer equipment). On the other hand, large enterprises in most cases possess their own financial – accounting services although in case of specialist issues they also employ external experts. The external tax consultants offer the possibility of passing to a significant extent the penal fiscal liability of the enterprise for correctness of settlement with the fiscal authorities on them (KUDERT, JAMROŻY 2007, pp. 18–21). The cost of tax consulting services in such situations is sometimes questioned by the tax authorities when booked as the cost of generating revenue, in particular because the performance of service is not documented (JAMROŻY 2000).

The difference between legal control of tax burdens (i.e. decreasing taxes) and illegal avoidance of taxation should be highlighted. Avoidance of taxation involves undertaking actions forbidden by the tax law (not reporting the tax

duty, not revealing all the sources of revenues or falsification of documents) Avoidance of taxation is illegal and unethical (GOMUŁOWICZ, MAŁECKI 2004. p. 251). Legal control of tax burden means taxation optimisation that should be understood as the choice of the form and structure of the planned transaction within the frameworks and limits of the effective tax legislation allowing decreasing the level of the tax burdens. There is no legal base that would order assuming the masochistic principle that the parties should settle their civil-legal relations in the form that is the most beneficial for the fiscal authorities (RADWAŃSKI 1999). The point is not the absolute minimisation of the tax burdens, because that would lead to the absolutely senseless recommendation: "Cease any business activity for the purpose of minimising the tax burden" (KUDERT, JAMROŻY 2007, p. 25).

In the enterprises decisions are taken all the time and some of those decisions are characterised by higher sensitivity to taxes while in case of others that sensitivity is lower. There are, nevertheless, no decisions that are free of tax implications. We can identify **strategic decisions** (concerning the form of taxation, the form of the direct investment, registered office of the company or the restructuring decisions) and the **current decisions** (investment decisions, financial decisions, decisions concerning representation of revenues or decisions concerning transfer prices) (KUDERT, JAMROŻY, 2007, p. 27).

Taxation and investment decisions

The basic methods of measuring the tax burdens include the:

1. Casuistic simulation of tax accounting is widely spread in practice and it involves computation of the tax liability in case of the specific actual situation assumed, which means that even in case of minor changes in the assumptions made the alternative variant may prove more favourable.

2. Partial tax calculus provides the so-called partial tax rates for every economic extent of planning that, without referring to the individual kinds of taxes, may be considered for determination of the tax burden.

3. Complementary methods:

– Verbal comparison of tax burdens that is the intuitive estimation of the benefits from the considered decision options. It is limited to the general assessment of tax burdens in case of the individual options. In practice of the tax consultant it is helpful in presenting the initial solutions that as a rule should be subjected to verification using precise statistical methods to the client.

– Determination of the break even tax rates or break even income is used when the profitability of the analysed alternatives is subject to change. The so called break-even point in which such a change takes place is searched for.

4. Dynamic methods:

– The net end value method – represents the difference between the end property obtained from implementation of a given investment project (interest-bearing cash flows) and the end property obtained from an alternative investment (taking the interest into account).

– Net present value method in which the time aspect is considered by discounting the cash flows. For the investment options covered by the analysis the net present values (NPV) are computed that are then compared. The investment project showing the highest net present value is the most favourable in the aspect of profitability. Negative net present value means that the interest on the capital involved in the analysed option is lower than the weighted average cost of capital – (WACC) expressed by the discount rate. The WACC is the appropriate discount rate assuming that the investment project considered is characterised by the same risk profile as the enterprise (KUDERT, JAMROŻY 2007, pp. 28–45). The net present value before taxation is expressed by the following formula:

$$NPV_0 = -I_0 + \sum_{k=1}^{K} \frac{CF_k}{(1+r)^k}$$

where:

NPV_0 – net present value before taxation for the period 0,
I_0 – initial investment outlay for the period 0,
k – time variable ($k = 1, ..., K$), where K means the last year of the computation period,
CF_k – cash flow (difference between revenues and expenditures) during year k of investment project operation before income tax,
r – discount rate (WACC).

Dynamic methods are the most appropriate for investment projects profitability assessment as they consider both the interest effects resulting from cash flow distributions over time (projected flows of revenues and expenditures) and the alternative investment project effectiveness.

In the net present value method the initial value of the investment outlay becomes the tax cost through depreciation deductions made according to the principles provided in art. 16a–16m of the Act on the corporate income tax and 22a–22o personal income tax. This applies in particular to fixed assets as well as intangible and legal assets. The tax law allows application of the linear method or the digressive method. The taxpayers make the choice of one of the methods for the individual fixed assets before commencement of depreciation. In case of applying the linear depreciation method the taxpayers use the

"Specification of year depreciation rates". Under special circumstances the taxpayers may increase the depreciation rates, for example in relation to machines and devices that are subject to rapid technological progress the depreciation rates can be doubled. In case of digressive depreciation, during the first year the depreciation rate is increased by the coefficient applied and during the consecutive years the depreciation deductions are made from the initial value each time decreased by the depreciation applied so far. Transition to the linear method takes place during the year during which the depreciation amount determined by means of the digressive method was lower than the depreciation amount determined by means of the linear method.

Considering the influence of taxation, the net present value of investment projects may be presented in the following way:

$$\mathrm{NPV}_{0t} = -I_0 + \sum_{k=1}^{K} \frac{\mathrm{CF}_k - t \cdot (\mathrm{CF}_k - D_k)}{(1 + r \cdot (1 - t))^k}$$

where:
NPV_{0t} – net present value after taxation during the period 0,
I_0 – initial investment outlay during the period 0,
k – time variable ($k = 1, ..., K$),
CF_k – cash flows during year k of the investment project operation,
t – income tax rate,
D_k – depreciation during the period k,
r – discount rate (WACC).

That formula contains numerous simplifications. The assumption that uniform income tax rate is applicable to all categories of income would be unrealistic. In case of capital companies – depending on the allocation of the profit – the proportional corporate income tax rate is applicable ($t^{\mathrm{prawne}} = 19\%$), or the accrued rate on the income of the capital company and on the dividends ($t^{\mathrm{dywidendy}} = 19\%$) disbursed to the shareholders that are individuals, i.e. $t^{\mathrm{prawne}} + t^{\mathrm{dywidendy}} \times (1 - t^{\mathrm{prawne}})$, which gives 34.39%.

In case of incurring losses Polish taxpayers are eligible to decrease the income during the consecutive five years where the decrease of the income during one tax year may not exceed 50% of the loss (art. 9 section 3 of the Act on personal income tax and art. 7 section 5 of the Act on corporate income tax). This means the possibility of accounting for the loss during two consecutive tax years the soonest.

In case of investment projects evaluation the special effect referred to in the literature as the "taxation paradox" occurs not infrequently. It means that the

net present value after considering the taxation is higher than the net present value before taxation. The situation may also take place where the net present value before taxation is negative and after taxation positive (and the other way round).

Example

The enterprise in the form of a limited liability company is planning purchasing a specialist machine at the purchase price of PLN 500,000 for the purpose of renting it out. As a consequence of that investment project the cash flows presented in table 1 are expected.

Table 1

Cash flows in the analysed investment project

Initial outlay I_0	Current surplus of revenues over expenditures CF_k			
k_0	k_1	k_2	k_3	k_4
–500,000	125,000	150,000	175,000	190,000

Source: Own computations based on KUDERT, JAMROŻY (2007, p. 64).

Assuming that the cash surplus may be invested at any time in the form of an interest bearing financial deposit at the interest rate of $r = 10\%$ (the best investment alternative) the net present value without considering the taxation is presented in table 2.

Table 2

Net present value of the analysed investment project without considering the taxation

K	0	1	2	3	4
CF_k	–500,000	125,000	150,000	175,000	190,000
CF_k after discounting	–500,000	113,635	123,965	131,480	129,775
NPV_0	–1,145				

Source: Own computations based on KUDERT, JAMROŻY (2007, p. 64).

$$CF_1 = \frac{125{,}000}{(1 + 0.1)^1} = 113{,}635$$

$$CF_2 = \frac{150{,}000}{(1 + 0.1)^2} = 123{,}965$$

$$CF_3 = \frac{175{,}000}{(1 + 0.1)^3} = 131{,}480$$

$$CF_4 = \frac{190{,}000}{(1 + 0.1)^4} = 129{,}775$$

$$NPV_0 = -500{,}000 + 113{,}635 + 123{,}965 + 131{,}480 + 129{,}775 = -1{,}145$$

The computations indicate that the investment in the asset is less profitable than the financial deposit. The investor will have PLN 1,145 less as compared to the alternative investment.

For the purpose of computing the net present value after taxation we assume that the machine depreciation period while applying the linear method is 4 years and the discount takes place according to the discount rate after taxation according to the tax rate $t = 19\%$. During the planning period there are no disbursements of profits to the benefit of shareholders. Determination of the net present value after taxation is presented in table 3.

Table 3

Net present value of the analysed investment project after taxation (linear depreciation)

K	0	1	2	3	4
Cash flows CF_k	–500,000	125,000	150,000	175,000	190,000
Linear depreciation deduction D_k	–	125,000	125,000	125,000	125,000
Taxable income	0	0	25,000	50,000	65,000
Tax liability T_k	0	0	–4,750	–9,500	–12,350
CF_k after taxation: $CF_k - T_k$	–500,000	125,000	145,250	165,500	177,650
CF_t after discounting	–500,000	115,635	124,300	131,015	130,095
NPV_{0t}	**1,045**	–	–	–	–

Source: Own computations based on KUDERT, JAMROŻY (2007, p. 65).

$$CF_{t1} = \frac{125{,}000 - 0.19 \cdot (125{,}000 - 125{,}000)}{(1 + 0.1 \cdot (1 - 0.19))^1} = 115{,}635$$

$$CF_{t2} = \frac{150{,}000 - 0.19 \cdot (150{,}000 - 125{,}000)}{(1 + 0.1 \cdot (1 - 0.19))^2} = 124{,}300$$

$$CF_{t3} = \frac{175{,}000 - 0.19 \cdot (175{,}000 - 125{,}000)}{(1 + 0.1 \cdot (1 - 0.19))^3} = 131{,}015$$

$$CF_{t4} = \frac{190{,}000 - 0.19 \cdot (190{,}000 - 125{,}000)}{(1 + 0.1 \cdot (1 - 0.19))^4} = 130{,}095$$

$$NPV_{0t} = -500{,}000 + 115{,}635 + 124{,}300 + 131{,}015 + 130{,}095 = 1{,}045$$

The computations presented in table 3 show that the net present value after considering the taxation is positive, i.e. the investment in the asset is profitable. This is an example of the so-called "taxation paradox".

In table 4 we assume that depreciation is applied according to the digressive method (coefficient 2.0). Starting with the tax year during which the depreciation rate according to the digressive method would be lower than the year depreciation amount computed by applying the linear method, i.e. the period $k = 3$, we shift to the linear method. The taxation occurs according to the accrued rate applicable to the profits disbursed to the shareholders, i.e. $t = 34{,}39$.

Table 4

Net present value of the analysed investment project after taxation (digressive depreciation)

K	0	1	2	3	4
Cash flows CF_k	–500,000	125,000	150,000	175,000	190,000
Digressive depreciation deduction D_k	–	250,000	125,000	125,000	0
Income or loss during the period k	0	–125,000	25,000	50,000	190,000
Accounting for the loss	–	–	–25,000	–50,000	–50,000
Tax liability T_k	0	0	0	0	–48,145
CF_k after taxation: $CF_k - T_k$	–500,000	125,000	150,000	175,000	141,855
CF_t after discounting	–500,000	117,305	132,100	144,625	110,015
NPV_{0t}	4,045	–	–	–	–

Source: Own computations based on KUDERT, JAMROŻY (2007, p. 66).

$$CF_{t1} = \frac{125{,}000 - 0.3439 \cdot (125{,}000 - 125{,}000)}{(1 + 0.1 \cdot (1 - 0.3439))^1} = 117{,}305$$

$$CF_{t2} = \frac{150{,}000 - 0.3439 \cdot (150{,}000 - 150{,}000)}{(1 + 0.1 \cdot (1 - 0.3439))^2} = 132{,}100$$

$$CF_{t3} = \frac{175{,}000 - 0.3439 \cdot (175{,}000 - 175{,}000)}{(1 + 0.1 \cdot (1 - 0.3439))^3} = 144{,}625$$

$$CF_{t4} = \frac{190{,}000 - 0.3439 \cdot (190{,}000 - 50{,}000)}{(1 + 0.1 \cdot (1 - 0.3439))^4} = 110{,}015$$

$$NPV_{0t} = -500{,}000 + 117{,}305 + 132{,}100 + 144{,}625 + 110{,}015 = 4{,}045$$

As the consequence of applying the modified assumptions, the net present value after taxation increases significantly, which results from the higher depreciation deductions during year $k = 1$, that is shifting the tax costs in time

and accounting for the entire tax loss incurred during $k = 1$, as well as the decrease of the discounting coefficient as a consequence of the higher taxation of the financial deposit according to the accrued tax rate.

Summary and conclusions

Taxes represent a significant element of costs for companies and their owners (shareholders). As a consequence, persons managing enterprises should consider taxation during the decision-taking processes. Managers are taking economic decisions continually at both the institutional and functional level. Those are decisions concerning the choice of the legal form, choice of the location for conducting business activities, decisions concerning the choice of the investment project or sources of financing for it, policy of income generation and distribution, accounting for tax losses or policy of transfer prices.

Maximisation of profit or minimisation of tax burden may be the goal of the entrepreneur. Both those goals are mutually competitive. If we maximise the profit than the income tax burden is also relatively high. The appropriate definition of the goal then may be: maximise the profit after taxation (KUDERT, JAMROŻY 2007, p. 25).

Knowledge of the relations taking place between economic transactions and the actual tax-legal situation set in the individual tax Acts results in the situation that those managing the enterprise have the possibility of influencing the level of tax burdens.

Given that, the managers should know the fundamental possibilities of controlling tax burdens and apply them in practice to the highest extent possible to achieve the goals of companies and their owners.

Taxation, generally, is one of the factors determining attractiveness of a given investment project. Differences in taxation of alternative projects may lead to the change in their relative profitability. It may not be excluded that considering the tax factor would cause that the net present value of the investment before taxation is negative and after taxation positive, or the other way round. Neglecting the taxation aspects in the decision-taking processes may result in inappropriate choices.

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