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## **Application of economic analysis in the context of tax planning for economic entities**

*The article examines the role and the peculiarities of conducting the financial analysis for taxation purposes. It determines the objects, the tasks of the financial analysis for taxation purposes and proposes the principal stages of its realization: to assess the influence of external factors, to learn the dynamics of tax payments, to assess tax risks, to study the levels of tax load, and to analyze the alternative variants of accounting policy elements. The authors tested the proposed methods of the financial analysis for taxation purposes at one of the researching enterprises of Ukraine. The paper introduces the concept of "tax risk" where the present study means the probability to pay unplanned expenditures by a taxpayer in the future in a case if this taxpayer does not follow the tax legislation. The authors develop the principal stages for conducting the assessment of tax risks concerning profit tax charges and payment: to determine the types of tax risks; to rank and assess the tax risk levels. To assess tax risks the researchers propose the scale for the assessment of tax risk inception probability and apply the following indices of mathematical statistics: the mathematical expectancy of random value, the average quadratic error of random value, and the coefficient of variation, which are calculated on the basis of the enterprise's statistical data for a definite preceding period.*

**Keywords:** taxes; financial analysis for taxation purposes; tax risks; alternative variants; chart of tax risks; tax load.

Profit tax is the enterprise's liability to the budget, the payment of which is directly connected with the decrease of enterprise's funds and this certainly requires a clearly organized system of internal control over the accuracy and legality of charging the present tax. The rates of profit tax payment are under heavy control of tax authorities and the outflow of enterprise's funds to pay the liability on the present tax will always take place if the enterprise is profitable according to the tax legislation requirements. Illegality, incorrectness and delays in profit tax charges and payment and the presentation of the relative tax accounts on this tax will cause unexpected and excessive write-off of the funds as fines and surcharge that will be charged by tax authorities for the breach of the tax legislation standards.

The charges of fines and surcharge by tax authorities is a peculiar risk for the enterprise to bear future expenditures «unproductive» for the economic activity and this situation can cause unplanned money outflow to pay the enterprise's penalties. Every economic entity more or less is disposed to tax risks, the assessment of which is the task for internal supervisors and it will allow to predict and prevent from risky situations.

The issue of tax planning concerning profit tax was examined in the works of the following scientists as T.O. Gusyeva, N.M. Makarova, E.V. Chypurenko and others. It is necessary to mention that these works are focused on the minimization of the rates for the profit tax liable to budget payment, and on the methods of tax load determination for a taxpayer. Much attention has recently been paid to the tax risk assessment and control, including tax risks, and this is connected with the frequent changes in the tax legislation and control strengthening by tax authorities. I.B. Atamanenko, T.Balyuk, H.Devlikamova, L.I. Donets, I.O. Docenko, A.V. Zykova, Ju.Ju. Kynev, E.V. Leus, Yu.A. Romanovs'ka, O.I. Seduh, M.Chornuy and others devote their studies to the risk assessment.

According to the regulations of the current national tax system, the tax legislation determines the alternatives that allow a profit taxpayer can legally manipulate with the profit tax rate. The alternatives conditionally can be divided into two groups: the variable components of incomes and expenditures, which are accurately determined by the Tax code of Ukraine and the variable components of incomes and expenditures, which are allowed by the Tax code of Ukraine, if they are under regulation of the enterprise's accounting policy. In accordance with the possibility of alternative variants of incomes and expenditure accounting by the Tax code of Ukraine, a taxpayer has a right to manage his own financial flows predicting the alternative variants in the enterprise's accounting policy.

The first group includes the methods of charging the amortization for the main means and other non-negotiable tangible assets, the methods of the assessment for stocks while their write-off, the methods for the ordinary cost determination etc. The second group includes the order for determination of financial expenditures, the expenditures for the improvement of non-negotiable assets, the expenditures for mobile connection, the methods for charging the reserve of doubtful debts etc. After the adoption of the Tax code of Ukraine in 2010 the amount of variants for the accounting policy elements concerning expenditures essentially increased.

It is positive for a complete maximization of expenditures that the enterprise will get a minimum profit tax rate that will result in a minimum outflow of funds for the payment of such a tax to the budget. The advantages of the minimization of expenditures resulting in maximum profit tax rates appear when tax authorities refer a profit taxpayer to the category of big taxpayers, who have functional preferences in servicing by tax authorities. However, such a form, from our point of view, is typical for big enterprises.

We consider that it is necessary to carry out the analysis of influence of the chosen alternatives on the enterprise's economic activity at the enterprise. Before choosing the alternative variants of accounting we suggest to conduct the financial analysis about the influence of the chosen objects upon the level of taxpayer's tax load.

In our opinion the financial analysis for taxation purposes should be carried out to determine the efficiency of the chosen elements of economic entity's accounting policy only during the process of accounting policy development, but if the policy accepts some shifts, then only in the cases permitted by the current legislation.

Chypurenko E.V. in his thesis singles out a new instrument for enterprise's management activity, namely, the tax analysis which consists in the quantitative dimension of taxation influence upon the formation and changing the enterprise's economic activity results to substantiate strategical and current business decisions [8, p. 18]. The author determines the main stages of conducting the tax analysis: the tax system analysis; the analysis of actual tax load; the analysis of variants of management decisions.

Unlike Chypurenko E.V., under the financial analysis for taxation purposes we understand the system of assessment of tax system influence upon the qualitative and quantitative descriptions of economic entity's financial results to make management decisions about the optimization of taxation.

The existence of the financial analysis for taxation purposes, first and foremost, is caused by the considerable direct impact of the tax system on the indices of efficiency of a taxpayer's activity, and the realization of indirect impact on its financial state. The direct influence of the tax system on the efficiency indices consists in the fact that the rates of tax payments, especially profit tax rates, influence on the size of enterprise's net profit, which is one of the main criteria of enterprise's activity efficiency. The indirect influence on the enterprise's financial state consists in the changes of liquidity indices, financial stability, etc. through the changes in the amount of own capital, balance currency, the changes in the amounts of money flow connected with the payment of taxes.

The aim of the financial analysis for taxation purposes is to determine the impact of the external factors of tax system, and also to assess the impact of economic entity's tax load on making management decisions about the accounting policy development. There are different points of view on the tasks, objects, and stages of the financial analysis in the professional literature, the generalization of these authors' opinions is presented in fig. 1.

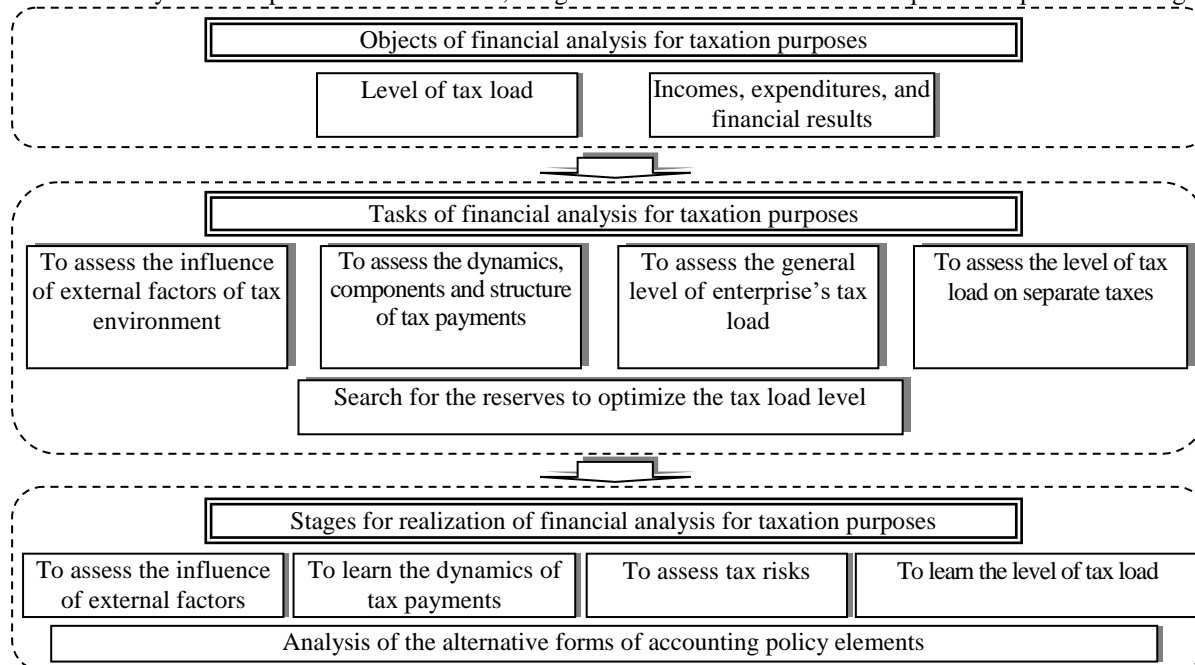


Fig. 1. Objects, tasks, and stages of financial analysis for taxation purposes

The determination of enterprise's tax load based on the financial statements data, is a key element in the above chart presented by the figure. As for the calculation of tax load, the authors propose various approaches, but the most spread one is the approach of the tax load level determination as the quotient between the profit tax rate and enterprise's proceeds from goods (works, services). The data of the conducted financial analysis are

taken into account while making management decisions, and accounting policy approval, however this methodology is far from a real taxation practice.

Unlike the existing methodology we propose to determine the tax load according to the tax declaration data. Such approach can be explained by the fact that, nowadays, the Finance Ministry of Ukraine has developed the Order of forming the plan and schedule for conducting documentary planned checks of taxpayers [5], according to which all the taxpayers are divided into three groups of the risk category: high, average and the group with the small level of tax risk.

According to the classification mentioned above, the tax load belongs to the group with the high category of tax risks. Besides, the index of tax load on the profit tax is checked right while accepting the tax declaration on the profit tax by tax authorities and if its value equals to the level, which is less than average-branch, then the enterprise gets into the group of taxpayers with the high level of tax risk.

The level of tax load depends on the declared profit tax liability for payment in the tax statements, the rate of which, in its turn, depends on the rates of expenditures and incomes included into the calculation of tax basis with the profit tax. During the enterprise's accounting policy development by approving in it the alternative variants of enterprise's expenditure accounting, it is necessary, in our opinion, to take into consideration how the use of such alternatives in practice will influence on the tax load level and the indices of economic entity's financial state.

We consider that the most optimal form is that one, which will simultaneously provide the maximization of taxpayer's expenditures and the optimal tax load level. The existing methodology of conducting the financial analysis is not suitable for reaching the indicated goal.

The determination of tax load level through the enterprise's profit tax and making decision about the possibility of its minimization or maximization. The assessment of the enterprise's tax load level is performed and its comparison with the average-branch value is carried out.

The tax load level is calculated by the following formula:

$$\%TL = \frac{PT}{I} \times 100\% ; \quad (1)$$

where, % TL – percentage of tax load with profit tax;

PT – amount of charged profit tax;

I – income, which is taken into account while calculating tax basis with profit tax.

The assessment of enterprise's tax load level on profit tax is necessary because according to the above mentioned methodical recommendations of the State Fiscal Service of Ukraine, all the profit taxpayers whose tax load level on profit tax is less than a unit or different from average-branch value, automatically get into the group of high tax risk. The level of tax load average-branch value is calculated by the State Fiscal Service of Ukraine separately for each type of national economy branch. It is necessary to point out the disadvantage of the application of such an index; this disadvantage reveals when the rates of the payed taxes by big taxpayers influence upon the average-branch values of tax load, that is why small and middle economic entities even minimizing their own expenditures, can not reach the average-branch level because of small scopes of operation.

If the enterprise's tax load level is less than average-branch value or less than a unit, then it is necessary to make decisions about the provision (in the accounting policy) of those alternatives, which will decrease the amount of expenditures that will be taken into consideration while calculating the profit for taxation.

If the enterprise's tax load level is higher than average-branch level, then the enterprise has a possibility to decrease it to the average-branch level with the help of adoption in the Decree about accounting policy those alternative forms for accounting of expenditures, which will maximize taxpayer's expenditures.

While determining the alternative variants of expenditure accounting it is chosen the most optimal variants for the assessment of enterprise's expenditures, which are variable according to the tax legislation, according to the decision (approved on the previous stage) about expenditure maximization and minimization.

The impact of the chosen options on the tax load level is checked at the assessment stage of influence of the chosen alternative variants on the tax load level and the indices of enterprise's activity efficiency and financial state. If according to the chosen alternative variants, the tax load level equals to average-branch and is not lower than its level, then the chosen variants are optimal; if the tax load level is less than average-branch, then it is necessary to look for new combinations for the alternative variants of expenditures.

Besides, at the current stage it is necessary to calculate how the chosen alternative variants will influence on the net profit index in the financial accounting, and then on the base of the changed net profit index it is necessary to calculate the main economic activity indices such as taxpayer's profitability, the profitability of own capital, sale profitability, the coefficient of autonomy and the coefficient of financial stability.

We consider that the most optimal form of combinations for the alternative expenditures will be that one, when the tax return level is closer to average-branch, but not less than it, and also when the economic indices of enterprise's activity are on the level, which corresponds to normative values.

To confirm the possibilities of the present methodology application in practice, we have conducted the financial analysis for the current state of the chosen alternative expenditures of Zhytomyr branch of private joint-stock company «Deko». The data of calculation and tax load calculation levels are presented in table 1.

Table 1

## Calculation of tax load amount for ZB PJ-SC «Deko»

Index	According to the financial accounting data			According to the data of tax calculations		
	Declared index amount	Index amount, got during maximization of expenditures	Index amount, got during minimization of expenditures	Declared index amount	Index amount, got during maximization of expenditures	Index amount, got during minimization of expenditures
1	2	3	4	5	6	7
Annual amortization amount of main means (rectilinear method), thousand грн.	39,0	87,0	39,0	39,0	105,0	39,0
Value limit to be included as main means, грн	2500,0	2500,0	2500,0	2500,0	2500,0	2500,0
Term of beneficial use of main means, years	10–70	10–70	10–70	10–70	10–70	10–70
Assessment of goods (sale cost method), thousand грн.	1113,0	1178,0	961,0	1113,0	1113,0	1113,0
Calculated reserve of doubtful debts (method of debtor obligation classification), thousand грн.	2,0	7,0	2,0	not included	not included	not included
Reserve for provision of leaves of absence, thousand грн.	55,0	55,0	0,0	35,0	35,0	0,0
Expenditures for delivery of sold goods, thousand грн.	259,0	259,0	259,0	259,0	259,0	Counted as delivery services provided free
Expenditures for mobile connection, thousand грн.	11,0	11,0	11,0	11,0	11,0	0,0
Percentage to get non-negotiable assets, thousand грн.	3,0	3,0	0,0	3,0	3,0	0,0
Balance value of foreign currency, thousand грн.	420,0	420,0	397	420,0	420,0	397
Repairing work, thousand грн.	85,0	85,0	85,0	85,0	85,0	30,0
Non-alternative expenditures, thousand грн.	535,0	535,0	535,0	480,0	480,0	480,0
Tax basis with profit tax, thousand грн.	278,0	160,0	511,0	440,0	243,5	741,0

End of table 1

1	2	3	4	5	6	7
Income, included for calculation of taxation object with profit tax, thousand hrn.	2800,00	2800,00	2800,00	2800,00	2800,00	2800,00
Rate of charged profit tax, thousand hrn.	64,0	37,0	118,0	101,0	56,0	170,0
Net profit, thousand hrn.	223,0	123,0	393,0	X	X	X
Tax load level, %	X	X	X	<b>3,6</b>	<b>2,0</b>	<b>6,1</b>

According to the chosen alternative variants of expenditures ZB PJ-SC «Deko», which are adopted by the Decree about accounting policy, the tax load level is 3,6 %, that is higher than an average-branch level 2 % (the enterprise is engaged in retail trade). That is why, the enterprise has the possibility to decrease the tax load level by changing separate alternative forms of expenditure accounting to those ones, which maximize the enterprise's expenditures. Thus we propose to choose all those alternative variants of expenditure accounting, which application will result in the highest assessment of enterprise's expenditures.

Consequently, we propose to carry out the substitution of the rectilinear method of charging the amortization on separate main means for the method of accelerated decrease of depreciated cost. All other alternative variants of the expenditures correspond to those ones, which maximize the enterprise's expenditures. If the substitute (concerning the method of amortization of the main means) is performed, then the enterprise's profit tax index will decrease at 45 thousand hrn. per year.

While recharging the tax load level taking into consideration the conditions of the changes proposed above, the tax load level equals to the average-branch value, it means that the result is positive.

To check the impact of the indicated changes on the principal economic indices of the enterprise's activity, we have calculated their real value in accordance with the current variant of expenditure accounting, and the value, that they will have if they apply the proposed changes (tabl. 2).

Table 2

*Economic indices of ZB PJ-SC «Deko» activity taking into account the proposed changes concerning the maximization and minimization of taxed expenditures*

№	Index	Normative value	Real index rate	Index rate taking into account maximization of expenditures	Index rate taking into account minimization of expenditures
1.	Enterprise's profitability, %	> 1	1,89	1,04	3,30
2.	Profitability of own capital, %	> 1	3,12	1,80	5,67
3.	Sale profitability, %		8,38	4,62	14,77
4.	Coefficient of autonomy, coef.	> 0,5	0,75	0,75	0,76
5.	Coefficient of financial stability, coef.	> 1	3,06	3,03	3,12

Table 2 shows that the index of profitability and the index of financial stability had been in a satisfactory condition before the changes about the alternative variants of expenditure accounting took place. The increase in the amount of expenditures, which are connected with the changing of the amortization method caused the essential decrease in all the indices, which remained within the normative values, and this indicates that the proposed changes in the enterprise's accounting policy do not threaten the economic activity of ZB PJ-SC «Deko» and can be implemented in practice.

If some economic indices of the activity were lower than the normative level, then the enterprise would have to apply a different way for the calculation of amortization.

As an experiment, we calculated the change of the tax load level in the case of minimization of tax expenditures for ZB PJ-SC «Deko». The conducted calculations show that the enterprise would have to pay the profit tax of 114 thousand hrn. more than it is paid in the researching period, and the tax load level would

increase twice. The enterprise's management considers the present variant to be too heavy, that is why it was rejected for application at the enterprise.

We are going to explore the order of performance of enterprise's tax risk assessment, however, the essence of risk and tax risk has to be discussed first.

Kynev Ju.Ju. considers that risk is «the consequence of an action or inaction that causes a real possibility of obtaining indeterminable results of various nature, which influence both positively and negatively on the financial and economic activity of an enterprise» [4]. In our opinion, such an approach is imperfect as the consequence of an action or inaction is already the result of realization of the risk, which negatively influences upon the enterprise's activity, that is why, we think, it is the error to consider that the risk can positively influence upon the enterprise's activity.

The right approach to the definition of the tax risk is given by Atamanenko I.B., who defines the tax risk as «a danger for an entity of tax jural relationships to bear financial and other losses connected with the process of taxation, as a result of negative errors for the present entity from the future predicted by him, counting on which decisions are made by him at the present time» [1, p. 16].

The Tax code of Ukraine (it. 14.1.221 st. 14) defines that «risk is the probability not to declare (incomplete declaring) tax liabilities by a taxpayer, the failure to fulfil another legislation by a taxpayer, who is under the control of the state tax authorities» [6, p. 34].

In accordance with the mentioned latest approaches, under the tax risk we understand the probability to bear unplanned expenditures in the future by a taxpayer, caused by the taxpayer's inobservance of the tax legislation.

The scientific professional literature often deals with the issues of division of tax risks into types, and this provides more effective management of them at an enterprise. Romanovs'ka Ju.A. singles out some kinds of tax risks: information risk, process risk, the risks of environment and the risks of reputation [7].

The risks connected with the complicated understanding or misunderstanding of some standards of the tax legislation are referred to the information risks by the author.

The process risks are the risks, which appear when very risky operations are carried out; the risks caused by badly adjusted system of control and accounting; the risks connected with the incompetence of accounting personnel etc.

The risks connected with «the indetermination of application of tax laws in various circumstances, and the risks of possible changes in the legislation and practice etc.» Ju.A. Romanovs'ka refers to the environment risks. We consider that it is inexpedient to unite the present types of the risks into the separate group of environment risks because they are similar to the information risks according to their content.

The reputation risks are those ones, the emergence of which is able to do harm to taxpayer's reputation, but Ju.A. Romanovs'ka does not indicate what exact kinds of risks they are. The same approach to the tax risk division is used by I.B. Atamanenko [1], and P.K. Bechko [2], however, the authors do not provide more detailed explanation of the indicated types of tax risks.

In our opinion, first, the competent approach to the risk identification and the assessment for the probability of their inception influence upon the timeliness and efficiency of tax risk management. Both foreign and domestic economic science researchers distinguish a great number of methods for the assessment of entrepreneurial business risks, but all of them are united into two groups: the qualitative (subjective) and quantitative (objective) methods for risk assessment.

The types of risks and factors of their influence are determined with the help of the qualitative analysis methods. According to I.O. Docenko «the main task of the qualitative assessment is the determination of possible types of risks, and factors that influence on the level of risks while performing the indicated type of the activity» [3, p. 172].

The use of the quantitative analysis methods allows to assess the rates of risks and the probability of their emergence. The rates of risks are assessed in absolute and relative quantities. The absolute quantities characterize the expenditures, which a taxpayer can bear in the future because of coming a certain risky event, the relative quantities characterize the tax risk level, which shows the probability of coming a risky event.

The most spread and universal methods for the assessment of risks are the preferential method, the method of expert assessment, the method of building a tree of decisions, Monte-Carlo method, the statistical method, the analogy method, the analytical and calculation method. Each mentioned method has its advantages and disadvantages in use. The most accurate data are received by the use of statistical method because all other methods are more subjective and depend on the competence and experience of supervisors.

The diagram in figure 2 shows the principal stages of conducting the assessment of tax risks concerning the profit tax charge and payment.

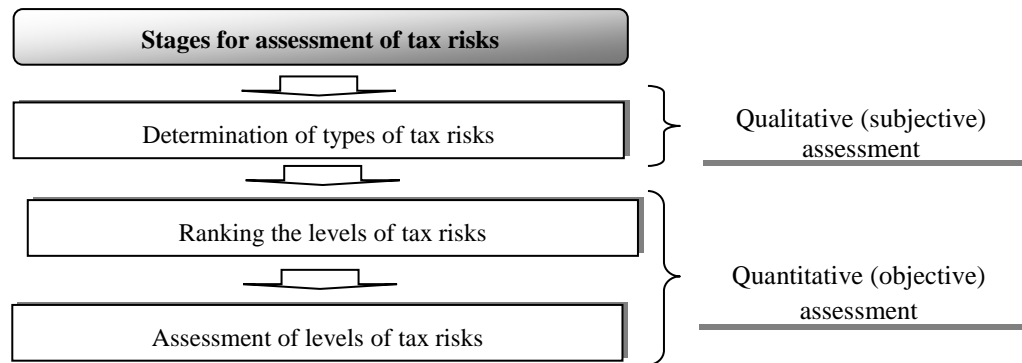


Fig. 2. Stages for assessment of tax risks referring to profit tax

The next step of the present investigation needs to discuss each stage of the proposed stages of the tax risk assessment. *Determination of tax risk types.* This stage consists in the fact that the supervisors determine all the possible tax risk types connected with the profit tax charge and payment. The officers, who determine the types of the tax risks should have some experience in the taxation sphere not only referring to the profit tax, but they should also understand the interconnection of the enterprise's activity peculiarities with the tax legislation requirements. The present stage together with the next stages is highly important as its strict fulfilment guarantees the enterprise the prevention from the inception of all the possible tax risks.

The profit taxpayer's risks are usually divided into external and internal. As for the present study, we use a different approach for division of tax risks, which types are strictly defined by the tax legislation of Ukraine. Such an approach can be explained by the fact that nowadays the Ministry of Finance of Ukraine has developed the Order of plan-schedule formation for carrying out the planned documentary checks of taxpayers [5], according to which all the taxpayers are divided into three groups of risk category: high, medium, and the group with small level of the tax risk.

The taxpayer from the high group of tax risk is included into the plan of checks not often than once a year, while the taxpayer from the medium group of tax risk is checked not often than once per two years, the taxpayer from the small group of tax risk is checked not often than once per three years. Accordingly, every taxpayer is interested in being checked as seldom as possible by the tax authorities because the majority of checks are accompanied with bearing the enterprise's expenditures to provide this check, and also to pay penalties caused by the tax check results.

*Ranking the tax risk levels.* Ranking the tax risk levels is necessary to arrange the tax risks according to their significance and probability inception. The tax risk significance is characterized by the degree of influence on the profit taxpayer's activity. In this case, the influence degree criterion is the risk criterion predicted by the State Fiscal Authority of Ukraine, according to which the risks are divided into high, medium, and small. The tax risks, united into the group of other tax risks, which are not determined by the tax authority, we refer to small risks.

As for ranking the tax risks according to the probability of their inception, the scientific literature has no uniform approach to the risk scale construction. For instance, I.O. Docenko uses the following scale for the assessment of tax risk inception probability: 0–0,1 – minimal level; 0,11–0,25 – small level; 0,26–0,5 – limiting permissible level; 0,51–0,75 – limiting critical level; 0,76–1,0 – catastrophic level [3, p. 152]. Kynev Ju.Ju. applies another approach: 0–0,2 – minimal risk; 0,2–0,3 – small risk; 0,3–0,4 – medium risk; 0,4–0,6 – high risk; 0,6–0,8 – maximal risk; 0,8–1,0 – critical risk [4].

Each examined tax risk assessment scale has a right for existence, but they can not be applied concerning the tax risks, as, in the first case, the concept of risk allowability is used and this concept is inexpedient for use as to the tax legislation breaches; in the other case we do not understand the gradation into the maximal and critical risks because two different approaches are used for uniting the risk types.

On the basis of generalization of the existing approaches, we propose the scale for the assessment of tax risk inception probability (tabl. 3).

Table 3

Scale for tax risk level assessment

Relative value of tax risk level	Tax risk level
Before 20 %	Minimal
From 20 % to 40 %	Small
From 40 % to 60 %	Medium
From 60 % to 80 %	High
Higher than 80 %	Maximal (critical)

Table 3 provides the gradation for the levels of all the possible enterprise's tax risks. The indicated relative values of the tax risk levels characterize the probability of its inception at an enterprise. Accordingly, the higher tax risk relative value causes the higher probability for the present tax risk to be able to realized at the enterprise.

Uniting the descriptions of significance and probability for tax risk inception, we get the risks, among which some belong to the high group of tax risks and have the critical or minimal inception probability, the other ones, vice versa, can be referred to the small risk group, but with the high inception probability. Such a combination of tax risk descriptions is very important while conducting the internal control over tax risks and influences upon the order of carrying out the check for risky operations.

The combination of significance and probability for tax risk inception, connected with the operations of profit tax charging and payment is presented as a «Tax risk chart». The «Tax risk chart» is the graphic text description of economic entity's text risks as the table, where one axis represents the significance of risk, and the other one represents the probability of its inception. The order of priority of internal control of tax risks is determined on the crossing of their significances and probabilities.

All the tax risks with the high significance and inception probability that equals to the maximal value (higher than 80 %) are subject to checking first. The tax risks with the high significance where the inception probability is lower than 80 %, are referred to the high risk group. The present risks are subject to checking immediately after maximal risks, however, in the case of the absence of the latter ones, the present risks are checked first.

The tax risks of medium significance belong to the high category of risks, if their inception probability is higher than 50 %, or to the medium category, if their inception probability is smaller than 50 %. Accordingly, the high category of risks is checked first in comparison with the medium category of tax risks. The tax risks of the small significance, except other tax risks, with the inception probability before 40 % belong to the small category of tax risks, with the inception probability from 40 до 60 % belong to the medium category, with the inception probability higher than 60 % belong to the high category of tax risks.

Other tax risks, unlike the previous ones, can be referred to the category of minimal risk, if their inception probability does not exceed 20 %. These tax risks should be checked last, if only there are tax risks of higher categories, however, it is necessary to mention that the present risks must be under control, anyway.

*Assessment of tax risk levels.* Carrying out the quantitative analysis of tax risk assessment requires the determination of the system of indices, with the help of which the absolute and relative quantities of tax risks will be determined. For the present study we have chosen the methods of mathematical statistics (tabl. 4) as just due to the statistical methods the most precise results are received that is the pledge of tax risk successful management.

All the calculations on the indices from table 4 are performed on the basis of the enterprise's statistical data for a definite preceding period. It is necessary to mention that more volume of the statistical data, more precise values are obtained. The absolute value of the tax risk level is determined with the help of the mathematical expectancy and average quadratic error indicis.

The use of the random value mathematical expectancy allows to determine the absolute predicting amount of expenditures, which the enterprise can bear in the case of realization of certain tax risk. For its calculation are used the amounts of expenditures, which took place in the past because of the tax risk inception ( $x_i$ ), and obtained by calculation, the coefficient of probability, with which the present expenditures took place in the past ( $p_i$ ). The probability coefficient ( $p_i$ ) is determined by division of a number of cases of the same amount to the general number of the researching cases.

Table 4

*Indices used for tax risk level assessment*

№	Index name	Calculation formula	Index purpose
1.	Random quantity mathematical expectancy	$M(X) = \sum_{i=1}^n x_i p_i$	Absolute expectant value of probable tax risk is calculated
2.	Average quadratic error of random quantity	$R = \sigma(X) = \sqrt{DX}, \text{ where}$ $DX = M(X)^2 - M^2(X)$	Extent of possible discordance with the expectant value of probable tax risk is calculated
3.	Coefficient of variation	$V(X) \leq \frac{\sigma(X)}{M(X)} \times 100\%$	Tax risk level is determined

With the help of average quadratic error of random quantity we determine the quantity of errors in the absolute index of predicting amount of expenditures, which the enterprise can bear in the case of realization of definite tax risk both toward increasing and toward decreasing amount of expenditures. During the calculation of average quadratic error we use the calculated values of mathematical expectancy of random quantity.



The coefficient of variation allows to assess the relative value for the level of expenditures, which characterizes the probability of tax risk realization and is calculated by division of the calculated average quadratic error to the calculated mathematical expectancy.

We are going to examine how the proposed methodology for the assessment of tax risks is realized at one of the researching enterprises.

The calculation of probability coefficient for tax risk inception ( $\pi_i$ ), necessary for the calculation of predicting amount of expenditures are given in table 5.

Table 5

Calculation of probability coefficient for tax risk inception at the researching enterprise

№	Number of event (s) Tax risk (X)	1 quarter			2 quarter			3 quarter			4 quarter		
		1.	Tax load level, $Xp$	5,5	5,7	5,7	5,5	0,0	5,8	5,8	0,0	5,6	5,6
	$\pi_i$ , coefficient	0,17	0,17	–	–	0,17	0,25	–	–	0,17	–	–	0,07
2.	Availability of relations with the entities of the simplified taxation system, th. hrn. $Xc$	–	–	–	–	50,0	–	–	16,5	–	–	–	–
	$\pi_i$ , coefficient	–	–	–	–	0,50	–	–	0,50	–	–	–	–
3.	Availability of relations with the contractors, who are in search, or who became bankrupt, th. hrn., $XH$	–	–	–	–	–	2,0	–	–	–	–	–	–
	$\pi_i$ , coefficient	–	–	–	–	–	1,00	–	–	–	–	–	–
4.	Other tax expenditures form a part more than 10 % of tax expenditures, th. hrn., $Xi$	15,8	–	–	24,3	–	–	–	5,0	–	8,6	–	–
	$\pi_i$ , coefficient	0,25	–	–	0,25	–	–	–	0,25	–	0,25	–	–

According to the data of table 5, the coefficient of probability for the tax load on the level of 5,5 % is 0,17, because among twelve researched variants, the tax load on the level of 5,5 % took place twice; for the level of 5,7 % the coefficient is 0,17; for the level of 0 % (the enterprise suffered loss) the coefficient is 0,17; for the level of 5,8 % the coefficient is 0,25; for the level of 5,6 % the coefficient is 0,17, and for the level of 5,4 % the coefficient is 0,07.

The tax risk connected with the availability of relations with the entities of the simplified taxation system for the last 12 months took place twice. The coefficient of probability for the availability of relations with the entities of the simplified taxation system at the amount of 50 th. hrn., as well as at the amount of 16,5 th. hrn. is 0,5.

The tax risk, when other tax expenditures form a part more than 10 % of tax expenditures took place for four times, and in each case its absolute values were different, that is why, each absolute value is characterized by the coefficient of probability, which is equal to 0,25.

Using the calculated in the table coefficients of probability for each out of four types of tax risks, which took place during twelve months, we determine with the help of the mathematical expectancy of appropriate random quantity the predicting amount of expenditures, which the enterprise can bear in a case of realization of each presented risks (formulas 2–5).

$$M(Xp) = 5,5 \times 0,17 + 5,7 \times 0,17 + 0,0 \times 0,17 + 5,8 \times 0,25 + 5,6 \times 0,17 + 5,4 \times 0,07 = 4,68 (\%); \quad (2)$$

$$M(Xc) = 50,0 \times 0,50 + 16,5 \times 0,50 = 33,3 (\text{th. hrn.}); \quad (3)$$

$$M(XH) = 2,0 \times 1,0 = 2,0 (\text{th. hrn.}); \quad (4)$$

$$M(Xi) = 15,8 \times 0,25 + 24,3 \times 0,25 + 5,0 \times 0,25 + 8,6 \times 0,25 = 13,4 (\text{th. hrn.}); \quad (5)$$

According to the calculated indices we have determined the predicting level of tax load and the amount of predicting expenditures, which take place because of the realization of the tax risk: the predicting level of the tax load is 4,68 %; the availability of relations with the entities of the simplified taxation system takes place at the

amount of 33,3 th. грн.; the relations can appear with the contractors, who became bankrupt at the amount of 2 th. грн.; the excess more than 10 % because of other tax expenditures in the structure of general tax expenditures takes place at the amount of 13,4 th. грн.

Having calculated the predicting absolute values of the the expenditures, which can take place at the researching enterprise, we are calculating the possible errors from the calculated predicting values (formulas 6–9):

$$\sigma(X_p) = \sqrt{(5,5)^2 \times 0,17 + (5,7)^2 \times 0,17 + (0,0)^2 \times 0,17 + (5,8)^2 \times 0,25 + (5,6)^2 \times 0,17 + (5,4)^2 \times 0,07 - 4,68^2} = 2,13 (\%); \quad (6)$$

$$\sigma(X_c) = \sqrt{(50,0)^2 \times 0,50 + (16,5)^2 \times 0,50 - 33,3^2} = 16,65 (\text{th. грн.}); \quad (7)$$

$$\sigma(X_n) = \sqrt{(2,0)^2 \times 1,0 - 2,0^2} = 0,00 (\text{th. грн.}); \quad (8)$$

$$\sigma(X_i) = \sqrt{(15,8)^2 \times 0,25 + (24,3)^2 \times 0,25 + (5,0)^2 \times 0,25 + (8,6)^2 \times 0,25 - 13,4^2} = 7,43 (\text{th. грн.}) \quad (9)$$

Having calculated the average quadratic errors we have determined the possible error of the tax load level from the predicting one at 2,13 %; the relations with the entities of the simplified taxation system take place at the amount of 16,65 th. грн.; the errors with the concerning the operations with the contractors, who became bankrupt will not take place; the excess more than 10 % because of other tax expenditures in the structure of general tax expenditures takes place at the amount of 7,43 th. грн.

Having at our disposal the calculated predicting values of the tax load level and the predicting values of the expenditures, we can calculate the levels for each tax risk examined above (formulas 10–13):

$$V(X_p) = \frac{2,13}{4,68} \times 100 \% = 45,51 \%; \quad (10)$$

$$V(X_c) = \frac{16,65}{33,3} \times 100 \% = 50,00 \%; \quad (11)$$

$$V(X_n) = \frac{0,0}{2,0} \times 100 \% = 0,0 \%; \quad (12)$$

$$V(X_i) = \frac{7,43}{13,4} \times 100 \% = 55,45 \%. \quad (13)$$

So, after calculation of the coefficients of variation, which characterize the probability for each determined tax risk at the researching enterprise, we have found out that the error of the tax load level can take place with the probability of 45,51 %; the availability of relations with the entities of the simplified taxation system can take place with the probability of 50 %; the realization of the relations with the contractors, who became bankrupt, will not take place; the excess of other tax expenditures at 10 % of general tax expenditures takes place with the probability of 55,45 %.

For more visual representation of the calculated levels of tax risks the «Chart of tax risks» of the present enterprise is under development. The chart will show not only the current tax risks at the researched enterprise, but also three more tax risks, which can also take place at the same enterprise: the discrepancy of tax load level to the average-branch level; the availability of relations with the entities of the simplified taxation system and other expenditures will form a part more than 10 % of general expenditures. Two revealed risks (the discrepancy of tax load level to the average-branch level and other expenditures form a part more than 10 % of general expenditures) are on the flat, which corresponds to the high risk category.

Thus, it is determined that the unsubstantiated optimization of economic entities' taxation can become the cause of decreasing the enterprise's activity efficiency, and also ranking the taxpayer to the high tax risk group by the tax authorities. It is proposed to make management decisions concerning the implementations of the changes in the profit taxpayer's accounting policy on the basis of the results of the financial analysis for taxation purposes; the present analysis is based on the calculation of tax load level and its influence on the indices of the economic entity's efficiency and financial stability.

As a result of breaches of standards of the Tax code of Ukraine by enterprises, such enterprises are imposed and deducted penalties and surcharges by the tax authorities, and these expenditures are the enterprise's «unproductive» expenditures, which negatively influence upon the financial result of the economic activity. The present expenditures are peculiar enterprise's tax risks, if there is a probability of their inception. It is proposed for profit taxpayers to carry out the control over tax risks through the data analysis of tax risks, which took place in preceding accounting periods, and on its base the development of the «Chart of tax risks» that will allow to prevent the enterprise from suffering «unproductive» expenditures, if the tax risk is realized. Internal control over the tax risks, including the operations referring to the profit tax charging and payment, should be put into practice at the beginning of the accounting period (the preceding control), during the accounting period (the current control), and at the end of the accounting period (the next control), which is a «subsoil» for conducting

the preceding control of the next accounting period. Thus, the present study proposes the stages for the process of the internal control of tax risks and operations concerning the profit tax charge and payment: 1) the identification of tax risks; 2) ranking and assessment of tax risks; 3) the determination of factors of tax risk inception.

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