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AUDIT ASSESSMENT OF RISKS ASSOCIATED WITH THE IMPLEMENTATION OF AN INVESTMENT PROJECT USING DUE DILIGENCE PROCEDURES

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A This paper studies and analyses methods of risk assessment of investment projects implementation with the help of agreed audit procedures, in particular due diligence, and develops proposals on their optimization and efficiency improvement. An important factor of the development of national economies is the investment in prospective and socially oriented sectors of the national economy. However, it is always important for an investor to understand in advance the potential results, consequences and risks of investing. In practice, the development and implementation of an investment project are accompanied by the compilation of business plans detailing expected costs, project revenue, payback period, rate of return, etc. However, this is not enough to assess the risks of an investor from the implementation of an investment project. In this case, the risk assessment procedures of the investment project, in particular due diligence, are widely used and effective. These procedures are not assurance tasks and are not related to the confirmation of financial statements and other financial information of the audit firm's client, but are classified as agreed procedures. The tasks of financial due diligence allow carrying out an assessment of the financial status and investment attractiveness of the investment subject, verifying the correctness and quality of the calculations outlined in the business plan, the structure of the planned expenditures, the rate of profitability of the project, investigating the area of activity in which the investment project is and norms of profitability that are normal for a given industry, diagnosing investment risks, identifying untypical operations, connecting parties in the presence of a group of enterprises. Standard auditor tools in the performance of due diligence procedures comprise indicators for evaluating the financial condition, vertical and horizontal analysis of financial statements, and analytical procedures related to the assessment of investment risks. We propose applying methods of economic and mathematical modeling when implementing the due diligence procedures in order to formalize, increase the efficiency, ensure the subjectivity of investment risk assessment, correctness of calculation of business plan indicators and implementation of general conclusions about the efficiency of investment.

K investment project, subject of investment, risk audit, due diligence, agreed procedures.

АУДИТОРСЬКА ОЦІНКА РИЗИКІВ, ПОВ'ЯЗАНИХ З РЕАЛІЗАЦІЄЮ ІНВЕСТИЦІЙНОГО ПРОЕКТУ З ВИКОРИСТАННЯМ ПРОЦЕДУР DUE DILIGENCE

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A В цій статті досліджено та проаналізовано методики оцінювання ризиків реалізації інвестиційних проектів за допомогою узгоджених аудиторських процедур, зокрема due diligence, та розроблено пропозиції щодо їх оптимізації та підвищення ефективності. Важливим фактором розвитку національних економік є інвестиційні процеси в перспективні та соціально орієнтовані галузі народного господарства. Однак при цьому інвестору завжди важливо заздалегідь розуміти потенційні результати, наслідки та ризики інвестування. На практиці розробка і реалізація інвестиційного проекту супроводжується складанням бізнес-планів, де детально зазначаються очікувані витрати, доходи від реалізації проекту, період окупності, норма прибутковості тощо. Однак цього недостатньо для оцінювання ризиків інвестора від реалізації інвестиційного проекту. В цьому разі поширеними і ефективними є аудиторські процедури оцінювання ризиків реалізації інвестиційного проекту, зокрема due diligence. Такі процедури не є завданнями з надання впевненості, не пов'язані з підтвердженням фінансової звітності та іншої фінансової інформації клієнта аудиторської фірми, а класифікуються як узгоджені процедури. Завдання з фінансового due diligence дозволяють здійснити оцінювання фінансового стану та інвестиційної привабливості суб'єкта інвестування, перевірити вірність та якість розрахунків, наведених в бізнес-плані, структуру планованих витрат, норму прибутковості проекту, дослідити галузь діяльності, в сфері якої знаходиться інвестиційний проект, та норми прибутковості, що є нормальними для цієї галузі, діагностувати ризики інвестування, виявити нетипові операції, пов'язаність сторін за наявності групи підприємств. Стандартний інструментарій аудиторів при здійсненні процедур due diligence становлять показники оцінювання фінансового стану, вертикальний та горизонтальний аналіз фінансової звітності, аналітичні процедури, пов'язані з оцінюванням ризиків інвестування. Нами пропонується застосування методів економіко-математичного моделювання при здійсненні процедур due diligence з метою формалізації, підвищення ефективності та забезпечення суб'єктивності оцінювання ризиків інвестування, правильності розрахунку показників бізнес-плану та здійснення загальних висновків щодо ефективності інвестування.

K інвестиційний проект, суб'єкт інвестування, аудит ризиків, due diligence, узгоджені процедури.

АУДИТОРСКАЯ ОЦЕНКА РИСКОВ, СВЯЗАННЫХ С РЕАЛИЗАЦИЕЙ ИНВЕСТИЦИОННОГО ПРОЕКТА С ИСПОЛЬЗОВАНИЕМ ПРОЦЕДУР DUE DILIGENCE

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A В данной статье исследованы и проанализированы методики оценки рисков реализации инвестиционных проектов с помощью согласованных аудиторских процедур, в частности due diligence, и разработаны предложения по их оптимизации и повышению эффективности. Важным фактором развития национальных экономик являются инвестиционные процессы в перспективные и социально ориентированные отрасли народного хозяйства. Однако при этом инвестору всегда важно заранее понимать потенциальные результаты, последствия и риски инвестирования. На практике разработка и реализация инвестиционного проекта сопровождается составлением бизнес-планов, где подробно указываются ожидаемые расходы, доходы от реализации проекта, период окупаемости, норма доходности и тому подобное. Однако этого недостаточно для оценки рисков инвестора от

реализации инвестиционного проекта. В данном случае распространенными и эффективными являются аудиторские процедуры оценки рисков реализации инвестиционного проекта, в частности *due diligence*. Данные процедуры не являются задачами по предоставлению уверенности, не связаны с подтверждением финансовой отчетности и иной финансовой информации клиента аудиторской фирмы, а классифицируются как согласованные процедуры. Задача по финансовому *due diligence* позволяет осуществить оценку финансового состояния и инвестиционной привлекательности субъекта инвестирования, проверить правильность и качество расчетов, приведенных в бизнес-плане, структуру планируемых затрат, норму доходности проекта, исследовать область деятельности, в сфере которой находится инвестиционный проект, и нормы доходности, которые являются нормальными для данной отрасли, диагностировать риски инвестирования, выявить нетипичные операции, связанность сторон при наличии группы предприятий. Стандартный инструментарий аудиторов при осуществлении процедур *due diligence* составляют показатели оценки финансового состояния, вертикальный и горизонтальный анализ финансовой отчетности, аналитические процедуры, связанные с оценкой рисков инвестирования. Нами предлагается применение методов экономико-математического моделирования при осуществлении процедур *due diligence* с целью формализации, повышения эффективности и обеспечения субъективности оценки рисков инвестирования, правильности расчета показателей бизнес-плана и осуществления общих выводов относительно эффективности инвестирования.

▣ инвестиционный проект, субъект инвестирования, аудит рисков, *due diligence*, согласованные процедуры.

Formulation of the problem. In today's practice, investors often use the audit service called *due diligence* to assess the risks associated with the implementation of investment projects. In most cases of investing in order to make the right decision about the appropriateness and the size of the investment, the investor must verify the potential investment object for the reliability of financial and tax statements and identify potential risks. This information is obtained by the investor following the results of financial *due diligence* procedures.

Audit procedures for evaluating the risks associated with the implementation of investment projects in accordance with International Quality Control, Auditing, Review, Other Assurance, and Related Services Pronouncements [9], not connected with confirmation of financial information and assurance and implemented within agreed procedures.

The purpose of the study is to study existing practices of the risk audit of investment projects implementation, in particular *due diligence*, and to develop proposals for their improvement.

Analysis of recent publications. The essence and application of *due diligence* procedures for assessing the risks of implementing investment projects was investigated by domestic and foreign scientists and practitioners, although these studies are rather new and not numerous. Among the scientists that studied the features of implementation of *due diligence* procedures we may distinguish in particular N. Antonov, V. Bondar, Iu. Guzov, D. Kondratenko, M. Cuter, V. Muzhylyvskiy, I. Nazarenko, K. Proskura, N. Salova, I. Stiazhkina, D. Sharkov and other domestic and foreign scientists [1, 2, 5, 6, 7, 11, 16, 17, 18].

In particular, I. Nazarenko considered the essence and purpose of *due diligence*, substantiated the expediency of using this verification in modern economic relations, and outlined the main stages of the algorithm for the implementation of *due diligence* [11]. D.Kondratenko and V.Muzhylyvskiy explored the possibilities of using *due diligence* to determine the commercial attractiveness of investment projects and concluded that these procedures provide the investor with an opportunity to make a reasonable decision on the investment project. The authors prove that *due diligence* makes it possible to assess a number of risks that are essential for a decision to own an asset, affects the adoption of strategic decisions and business activities of the company[6].

The works of Iu. Guzov and N.Savenkova are devoted to the issues of conducting *due diligence* and assessing the risk associated with the acquisition of investment objects. The authors considered the issues of detection and assessment of risks using quantitative and qualitative methods on examples of indicators of net debt, working capital, and EBITDA [5].

D. Sharkov defined the stages of structuring operations on mergers and acquisitions of enterprises. His work explains the risks of those involved in this process at each of its levels, the feature of *due diligence* process at each of the stages is explained. The necessity of conducting *due diligence* with the aim of avoiding or maximizing the reduction of business risks associated with the implementation of mergers and acquisitions procedures is proved [18].

The papers of V.Bondar developed a comprehensive methodology for expertise of legal and financial situation of the enterprise in the preparation of a report on the results of *due diligence* procedures, which provides a thorough analysis of all assets and liabilities

of the enterprise, verification of legal aspects of economic activity, the detection of a real legal and financial situation of the subject of economic activity, analysis of the management system of the company, assessment of the potential risks of loss of assets or their parts [2].

K. Proskura and N. Salova identified the role of EBITDA in the implementation of financial due diligence procedures. The researchers found that financial due diligence is a detailed financial analysis that allows you to assess the current financial position of an investment object and its ability to generate income in the nearest future. According to the authors, in the course of due diligence there are a number of evaluated financial indicators, the most important of which, in our opinion, is EBITDA allowing to evaluate how profitable is the main activity of the company and its performance regardless of size of credit indebtedness and tax burden, to build a long-term efficient trend of financial activity [16].

The achievements and scientific developments of the authors mentioned above and other ones allow gaining deep enough understanding of the essence, significance and peculiarities of the application of due diligence procedures, but methods for carrying out these procedures, a set of analytical tools and techniques for assessing the investment attractiveness of business projects are developed insufficiently.

Main material. Conditionally the audit service of due diligence may be divided into several components that differ from each other both by program purposes and methods of conducting. As a rule, due diligence procedure has three components: financial due diligence, assessment (usually performed by independent appraisers), legal due diligence. Below, we shall study the financial due diligence in more details.

Financial due diligence is a detailed financial analysis that gives an opinion on the current financial condition of the investigated company and its ability to generate profits in the nearest future.

The sequence of execution and a set of audit procedures that must include a financial due diligence service are not regulated by norms and law. The volumes and functional services are discussed in advance by the parties and are approved in the contract, which is the legal obligation of the auditor, or the Executor, to the investor or his representatives, Customers (quite often these are law firms that serve the process of sale and purchase, creation and reorganization of corporate rights). In this study, we will summarize the practices and lists of audit procedures performed by auditors in the process of performing due diligence

tasks in order to assess the risks of implementing investment projects.

The due diligence procedures are governed by the International Standard for Related Services 4400 «Engagements to Perform Agreed-Upon Procedures Regarding Financial Information» (hereinafter ISRS 4400) [10]. The ISRS 4400 is developed to meet financial information tasks. This standard establishes the requirements for the auditor's professional responsibility when working on tasks for the implementation of agreed procedures for financial information, as well as the form and content of the report provided by the auditor in connection with the execution of such a task. Since, in the framework of due diligence procedures, the auditor does not make conclusion, but only provides a report on the actual results of the agreed procedures, assurance is not expressed [10].

Under Paragraph 9, ISRS 4400, before the agreed procedures, including due diligence, the auditor should ensure that representatives of the investment subject and other specified parties who will receive the copies of the report on the actual results clearly understand the agreed procedures and the terms of the task. Questions to be addressed include:

- the nature of the task, including the fact that the performed procedures are not an audit or review, and, accordingly, assurance will not be expressed;
- setting the goal of the task;
- identification of the financial information to which the agreed procedures will apply;
- nature, timing and scope of specific procedures to be applied;
- predictable form of the report on actual results;
- limitation of the quantity of users of the report on the actual results.

In accordance with Paragraph, ISRS 4400, the procedures used in the task for the implementation of agreed procedures may include the following:

- request and analysis;
- recalculation, comparison and other verification of records accuracy;
- observation;
- verification;
- obtaining confirmation.

Let us specify the procedures performed by auditors for financial due diligence tasks. In our opinion, substantive procedures when performing financial due diligence tasks should include:

- analysis of financial indicators of business, its prospects,
- assessment of dynamics of the financial indicators of business activity;

- assessment of property, rights and obligations that are sold as part of business;
- assessment of the condition of fixed assets: their suitability for production, depreciation, need for renovation, the need for basic facilities for business (and the prospects for selling unnecessary fixed assets);
- assessment of the financial scheme of business, the circle of legal entities, the performance of which is involved in the formation of financial indicators of the business.

The tasks of auditors in the framework of financial due diligence procedures are to conduct a financial audit of the enterprise, including:

- analysis of the structure of revenue and expenses of the investment object over the analyzed period, analysis of the main indicators of the activity of the investment object;
- assessment of the internal control system in the part of the document flow that relates to the expenses of the investment object, a selective analysis of the quality and completeness of the documents confirming the expenses of the investment object;
- analysis of fixed assets: general composition, accrued depreciation, revaluation outcomes;
- analysis of financial investments of the investment object;
- analysis of receivables;
- analysis of inventory of the investment object: composition, cost, dynamics, illiquids;
- analysis of accounts payable;
- analysis of contingent liabilities (fines, penalties, guarantees issued in the provision of third-party debts, bonded notes, lawsuits filed against the company, pledges and other substantive-legal encumbrances of the company's property);
- analysis of the completeness and reliability of the accounting for assets and liabilities reflected in the balance sheet (statement of financial position) of the investment object;
- identification and generalization of all significant tax risks, unaccounted and (or) potential tax liabilities, which the investment object has.

In established domestic practice of audit in the course of the due diligence, the structure of assets and liabilities of the enterprise, its income and expenses, receivables and payables, bank loans, the system of financial control and planning, the completeness of management information and the quality of reporting are usually analyzed.

Due diligence procedures also allow for identifying unusual and non-specific operations for concrete business, analyzing intragroup turnovers and their

impact on the financial performance of a particular company, investor or investment object (the recipient).

Due diligence focuses on the analysis of cash flows and liquidity of current operations, as well as factors that can strengthen or weaken them in the short term. In relation to the general business prospects, planned sales volumes and profitability, the strategic and current financial plans of the enterprise, into which the investment is planned, are also analyzed in the context of existing (current) indicators.

In addition to the instruments already in use, when implementing the due diligence procedures, we propose to apply a model for assessing audit risks associated with the implementation of investment projects, which is based on the study of mathematical and statistical models of the enterprise, quantitative studies of economic phenomena, explanation and forecasting of the development of economic processes on the enterprise.

The economic-mathematical model is the economic abstraction expressed in formally-mathematical terms, the logical structure of which is defined as the objective properties of the objects of the description, as well as the subjective target factor of the research for which this description is made. Structurally, each mathematical model represents a set of interrelated mathematical dependences that represent certain groups of real economic dependencies. Economic and mathematical models are classified according to various features, including the mathematical tool used in modeling [8]. In the generalized form, the equation of the economic-mathematical model has the form:

$$Y = F(x_1, x_2, \dots, x_m) \quad (1),$$

where Y is the result, or a dependent variable, the variation of which describes this equation,

x_1, x_2, \dots, x_m are factors or independent variables that determine the behavior of Y.

In order to execute due diligence procedures, the formation of an economic-mathematical model is carried out at the following stages:

- the object of research is determined: in our case this is an investment project;
- the purpose of the study is formulated: to calculate the economic efficiency and risks of implementing the investment project;
- structural and functional elements are distinguished in the investigated investment project and the most significant qualitative characteristics of these elements that influence the achievement of the set goal are distinguished;
- symbolic designations are introduced to take into account the characteristics of an economic object.

It is determined which of them will be considered as dependent variables, and which as independent. The relationship between certain parameters of the model is formalized, that is, the actual economic-mathematical model is formed;

- calculations are carried out on the model and the results of the final calculations are analyzed.

If the results are unsatisfactory from the point of view of the inadequacy of displaying the modeled result of the investment project implementation, the return is done to one of the previous points and the process is repeated.

The purpose of econometric modeling application in the research of investment projects is automation, increase of efficiency, provision of objectivity and impartiality of the results of performance of audit tasks for risk assessment of investment projects realization, substantiation in making managerial decisions.

In general, the main task of economic-mathematical modeling is to evaluate the model parameters taking into account the features of the input information, to verify the conformity of models to the investigated phenomenon and to predict the development of economic processes, in particular the risks of implementing an investment project.

The economic model proposed in this study makes it possible to carry out risk assessments when performing due diligence procedures regarding the appropriateness of financing an investment project.

When modeling the economic process of risk assessment for investment projects implementation, we have taken into account the following main dependencies:

- unemployment rate in the country;
- inflation rate in the country;
- the volume of production produced by the subject of investment over a certain period of the investment project (where the subject of investment is the economic entity, in favor of which the financing is made);
- amount of spent capital during the period of realization of the investment project;
- liquidity of the investment subject enterprise;
- financial stability (independence) of the subject of investment;
- profitability of the subject of investment;
- probability of bankruptcy of the subject of investment;
- net present value of the investment project;
- internal rate of return on investment project;
- discounted payback period of the investment project;
- integral assessment of the investment attractiveness of the project.

When implementing this model, information is formed on the basis of quantitative observations of the objects of research, i.e. investment projects, in particular, indicators of financial statements over a series of successive periods. It should be borne in mind that there is a high level of inertia between the dependent variables that's why it largely determines the impossibility of providing assurance by auditor on the results of due diligence procedures.

Assessing the level of investment attractiveness of the project with the help of our model is carried out at the following stages.

The first stage is an assessment of the risks of implementing investment projects. All groups of indicators for assessing the investment attractiveness of enterprises and organizations, as well as indicators located in these groups are assigned to the corresponding numerical values depending on their importance. Like the limit values of indicators, the weight may be corrected. The indicated weight is derived from time, specific political, social situation, and other factors, and therefore this characteristic has a probable origin.

When the investor familiarizes with the object of investing and identifies the potential for return on investment, the following group of indicators is used [14]:

1. An active part of fixed assets determines the share of production fixed assets of the main type of activity in fixed assets.
2. Indicators of financial stability (solvency) assessment of the invested object. The group of indicators for assessing the financial stability (solvency) of the invested object is a priority in the financial substantiation of investment projects, as well as in solving other issues related to the definition of the availability, placement and use of funds. In order to determine the level of financial sustainability of the enterprise, there are assessed indicators that characterize the provision of inventory and expenditures by the relevant sources of formation.
3. Indicators that characterize solvency of an enterprise, in particular, are the amount and maneuverability of working capital.

Working capital is the difference between the current assets of the enterprise and its short-term liabilities, that is, it consists of a part of current assets, which are financed by equity and long-term liabilities [15].

The presence of working capital in the company means not only its ability to pay its own current debts, but also the availability of opportunities to expand activity and investment. Maneuverability of working capital characterizes the share of inventory in its total

amount, i.e. it is determined by the ratio of inventory to the working capital.

To characterize the solvency of the enterprise, we calculated the following coefficients [14]:

- coefficient of independence, which characterizes the ability of an enterprise to fulfill its external obligations through the use of its own assets, its independence from borrowed sources. The share of equity in the total amount of financial resources should be not less than 50%, i.e. the coefficient of independence is $\geq 0,5$;
 - funding factor must be equal to 2.0;
 - coefficient of financial stability should be in the range from 0,85 to 0,90;
 - indicator of financial leverage characterizes the dependence of the enterprise on long-term liabilities.
4. Assessment of assets liquidity indicators of the invested object. The analysis of liquidity of the assets of an enterprise helps to determine the possibility of covering the liabilities of the enterprise with its assets, the term of transformation of which in cash corresponds to the maturity of obligations. For the analysis of liquidity of assets, the following indicators are calculated:
- current (total) coverage ratio, which shows how many monetary units of working capital falls on each monetary unit of short-term liabilities. The critical value of coverage ratio is 1, the value of coverage ratio within 1-1,5 indicates that the company liquidates debts timely;
 - ratio of payables and receivables. If the payables exceed the receivables, it is necessary to find out the reasons for such a situation (which may be due to difficulties in the sales of products, etc.);
 - absolute liquidity ratio, which characterizes the immediate readiness of the enterprise to eliminate short-term debt. The absolute liquidity ratio allows you to determine which part of the short-term debt may be repayable by the company.
5. Indicators for estimating the profitability of the invested object, which includes a set of indicators:
- return on investment, which characterizes the efficiency of the use of investment funds and shows the profit earned on the unit of investment cost;
 - coefficient of profitability of equity, which describes the efficiency of investment in equity;
 - operating profitability of sales, which characterizes the amount of net profit per unit of sold production and shows that the company
- is able to receive not only sales revenue, but also profit;
- operating cost ratio, which characterizes the efficiency of investments in product sales;
 - return on assets ratio, which shows the net profit for the unit value of assets.
6. Indicators of assessment of the invested object's business activity. Business activity is the production achievements of the enterprise, the main criteria of which are indicators that characterize the volume of production [12], in particular:
- labour productivity;
 - fundraising that is efficiency of the use of production fixed assets;
 - turnover of funds in settlements (in turns). This coefficient shows the average amount of turnover for the relevant period;
 - coefficient of turnover of funds in settlements (in days). This coefficient shows over how many days money makes a full turn;
 - turnover of inventories (in turns). This coefficient indicates the number of turnovers of inventories over the relevant period;
 - turnover rate of inventories (in days) indicates the number of days that the company needed to replenish its inventories;
 - turnover of equity. Turnover of equity refers to the number of turnovers of equity for the relevant period;
 - turnover of fixed capital. Turnover of fixed capital indicates the number of turnovers of fixed assets over the relevant period.
- The low level of efficiency of economic resources management in the investment subject is one of the factors of high risk of investing in this project from the investor's and the creditor's sides.
- We will carry out an integrated assessment of the risks of implementing an investment project on the example of the conditional enterprise Gamma (hereinafter Gamma) according to the proposed methodology. In order to determine the most important components of the risk assessment of investment projects, Gamma has to analyze in more detail the indicators of the financial state.
- The first stage of risk assessment of an investment project of an enterprise is an analysis of the composition and structure of assets and capital, the ratio of the main types of which determines the coefficients of the financial state.
- An important indicator in assessing the level of investment risk is the coefficient of maneuverability of equity. The coefficient has a normal value of > 0.5 . The formula for calculating the coefficient is as follows:

$$KMe = \frac{(Equity - Non-current assets)}{Equity} \quad (2)$$

The coefficient of autonomy shows that the company is sufficiently independent from external sources of funding and this ratio is quite stable. A positive point is also a decrease in the ratio of borrowed and own funds, indicating that the company does not need external sources to solve financial problems. The factors of maneuverability and provision of inventories and costs by own sources of the company correspond to the norm, which indicates the proper use of own funds.

The efficiency of the use of investment resources is determined by the indicators of turnover of the enterprise's formed capital invested in its assets and indicators of profitability.

The offered economic-mathematical model allows, if necessary, carrying out ratings and prioritizing investments of a number of investment projects. For this purpose, the above calculations are carried out separately for each project, then the following method defines an integrated indicator and the values of the obtained indicators are tested for being the most efficient.

With the help of the economic-mathematical model, it is possible to calculate an integrated indicator of the risk level of implementing an investment project or a number of projects. The algorithm of calculation is as follows. A set of observation objects is selected for establishing the investment attractiveness rating. An appropriate system of indicators is drawn up, on the basis of which the integrated assessment (profitability, liquidity, etc.) is carried out. The values of these indicators are calculated for each object and on average in their totality [3]:

$$\bar{X}_j = \frac{\sum X_{ij}}{n} \quad (3)$$

To eliminate the scale of the indicators calculated in determining the integrated indicator of the efficiency of the investment project, we will calculate the aggregate indicators in the form of the ratio of indicators of individual objects to their average value in a set of objects:

$$P_{\phi} = \frac{X_{\phi}}{\bar{X}_j} \quad (4),$$

and determine their average value:

$$\bar{P}_j = \frac{\sum P_{\phi}}{k} \quad (5),$$

where k is the number of indicators used in the calculations.

Ranked row is, in essence, an appropriate rating of objects by investment attractiveness.

Together with the existing advantages of the proposed model: automation and ensuring the objectivity of assessing the level of risks of the investment project implementation, we highlight some of the disadvantages of such an approach to determining the integral assessment of the investment attractiveness of the enterprise, in particular:

- all indicators should be direct or reverse;
- the reasonableness of calculations of the investment attractiveness rating will increase, if you give some indicators differentiated weight according to their significance.

To complement the integral assessment of the investment attractiveness of the enterprise, we will evaluate the probability of the bankruptcy of the investment object. Bankruptcy means the recognized by economic court debtor's inability to restore his solvency through the sanation procedures and amicable settlement, and to repay the monetary claims of creditors established in the legally determined procedure, not otherwise than through the application of the liquidation procedure [13]. The bankruptcy of an enterprise may be caused by deterioration of all indicators that determine its financial stability, and therefore analysis of the probability of occurrence of such a state is based on them. To evaluate the probability of bankruptcy, we use the model of E. Altman [4]:

$$Z = 1,2X1 + 1,4X2 + 3,3X3 + 0,6X4 + 0,999X5 \quad (6),$$

where Z is an indicator of the threat of bankruptcy; X1 is ratio of own working capital to total assets; X2 is ratio of retained earnings to total assets; X3 is the ratio of profit before payment of interest and taxes to assets;

X4 is the ratio of own and borrowed capital;

X5 is ratio of revenues from sales to total assets.

To justify the feasibility of creating an investment portfolio and its financing, we suggest using the model of capital asset valuation (CAMP) [19].

This model is based on the use of a linear correlation between the return on risk assets and the market index of profitability.

The model has a potential value in assessing the feasibility of investments as it:

1) provides definition of necessary or expected profitability of projects;

2) provides an alternative approach to assessing the value of the company's capital;

3) is used in assessing the cost of the firm and assessing the possible debt if the project is adopted. Therefore, this method combines investment, decision-making and evaluation processes.

Formalized look of the model is as follows:

$$R_{jt} = \alpha_j + B_j R_{mt} + e_{jt} \quad (7),$$

where R_{jt} is a random variable representing the rate of profitability of asset j in period t ;

R_{mt} is a random variable reflecting the rate of return on assets market in period t ;

σ_j , B_j are parameters of asset j .

According to this model, the expected return on the portfolio of projects, $E(R_p)$, is the weighted average of expected returns for individual projects included in the portfolio and may be determined by the formula:

$$E(R_p) = \sum_{j=1}^N X_j E(R_j) \quad (8),$$

where X_j is the share of the total budget or portfolio invested in the project j .

Expected profitability of each individual project that is part of the investment portfolio is determined by the following formula:

$$E(R_j) = \alpha_j + B_j E(R_m), \quad j = \overline{1, k} \quad (9),$$

where R_t is a random variable reflecting the rate of profitability of the asset market;

σ_j , B_j are parameters of asset j .

In accordance with the method of least squares, the values of the parameters of the regression equation of the expected return on a project, σ_j and B_j will be equal to:

$$B_j = \frac{n \sum_{t=1}^n R_{mt} R_{jt} - \left(\sum_{t=1}^n R_{mt} \right) \left(\sum_{t=1}^n R_{jt} \right)}{n \sum_{t=1}^n R_{mt}^2 - \left(\sum_{t=1}^n R_{mt} \right)^2} \quad (10),$$

$$E(R_j) = \alpha_j + B_j E(R_m), \quad j = \overline{1, k} \quad (11)$$

The coefficient B_j of the project shows by how many percent the expected rate of return on a project increases (decreases), if the expected rate of return on the market increases (decreases) by 1%. The coefficient B_j may also be interpreted as a measure of the market risk of a project. Let us consider its possible values:

$B_j=0$. This means that the expected rate of return on a project does not react to the change of the market, that is, the project does not have a market risk;

$B_j<1$. Moderate reaction of the project profitability to market change. Such a project is called protected.

$B_j=1$. The rate of profitability of the project changes in the same way as the market rate of return.

$B_j>1$. The rate of profitability of the project depends on the expected rate of return. Such a project is called aggressive.

For investment portfolio B_j the coefficient is calculated as follows [19]:

$$B_p = \sum_{j=1}^N X_j \cdot B_j \quad (12)$$

Among the potential risks of the implementation of investment portfolios, in particular, we distinguish the following [19]:

1) the risk associated with the impact on the project j of the market rate of return multiplied by its dispersion B_j^2 ;

2) the risk associated with the random variable of the project, that is, with the emergence of reasons not related to the functioning of the market: Q_j^2 .

The first of these types of risk is called systematic risk. It can not be diversified, as it is the result of volatility in the market profitability of projects. The second type of risk, which is called non-systematic or specific, may be diversified by selecting other assets (projects) that are weakly or negatively correlated with the project being studied. Thus, the cumulative project risk j will be equal to [19]:

$$\sigma_{R_j}^2 = B_j^2 \sigma_m^2 + Q_j^2 \quad (13)$$

The non-systematic risk of project j is the square of the standard error of regression equation estimate, which is defined as:

$$Q_j^2 = \frac{\sum (R_{jt} - E(R_{jt}))^2}{n - 2} \quad (14),$$

where R_{jt} is the real rate of profitability of the project j in the year t ;

$E(R_{jt})$ is the expected rate of profitability of the project j in the year t .

The risk of a portfolio based on market data is defined with the CAMP method as:

$$\sigma_p = \sqrt{B_p^2 \sigma_m^2 + \sum_{j=1}^N X_j^2 Q_j^2} \quad (15)$$

The systematic risk of the $B_p^2 \sigma_m^2$ portfolio is a part of aggregate risk of σ_p portfolio, which is based on the ratio of market profitability. Since the profitability of all projects in the portfolio correlates to a certain extent with market profitability, the systematic risk is not diversified. There is no combination of risky projects that could eliminate market risk. Non-systematic risk is the proportion of aggregate portfolio risk σ_p that occurs under the influence of non-market factors. Non-systematic risk measures variability of the return on assets under the influence of random factors.

Unsystematic risk is a diversified risk and should strive for zero in a well-formed portfolio. The reason for this is that Q_j^2 is a standard error of the regression equation. If number of projects in a portfolio N increases, the value of X_j^2 becomes proportionally smaller and the limit value of the amount strives to zero, but never reaches it.

Conclusions. According to the results of the study, we obtained the following conclusions:

- 1) among the methods of risk assessment for the implementation of investment projects with the help of the agreed audit procedures, we have identified the complex of due diligence audit procedures as the most comprehensive and effective;
- 2) procedures for due diligence are not assurance tasks and are not related to the confirmation of financial statements and other financial information of the audit firm's client, but are classified as agreed procedures;
- 3) the tasks of financial due diligence allow assessment of the financial condition and investment attractiveness of the subject of investment, verification of correctness and quality calculations shown in the business plan, the structure of planned expenditures, the rate of return of the project, exploration of the area of activities, in which the investment project is, and the rates of return that are normal for the industry, diagnosing investment risks, detecting untypical operations, connectedness of parties in the presence of a group of enterprises;
- 4) the standard tools of auditors in carrying out due diligence procedures are the indicators of the financial condition assessment, vertical and horizontal analysis of financial statements, analytical procedures related to risk assessment of investment.
- 5) we proposed the use of economic-mathematical modeling methods in the carrying out the due diligence procedures with a purpose of formalizing, improving efficiency by providing investment risk assessment subjectivity, the correct calculation of the indicators of business plans and implementation of general conclusions on the investment efficiency.

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