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# Use of scoring methods to evaluate investment projects

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**Abstract.** The purpose of this publication was to develop a scoring methodology for evaluating and ranking investment projects by their attractiveness and potential success, as well as to use this evaluation to identify more effective projects. The article provided a methodology for calculating possible risks for further use in project ranking. The article presented a simplified mathematical model for comparing investment projects and ranking them. The model can be used in the development of own evaluation methods. In this article, methods such as discounted cash flow, real options method, expert judgment, hierarchy analysis and Bill Payne's method were considered for start-up valuation. The key elements of the evaluation process were the determination of criteria and weighting factors. Criteria included important evaluation criteria (e.g., profitability, risk, strategic importance, social impact). Each criterion had a percentage weight based on relative importance, with weights summarised up to 100%. The article considered key aspects of effective investment with a focus on the need to minimise risks and strive for profit maximisation. The authors analysed various types of risks, which may include loss of funds due to project inefficiency or underestimation of the potential of promising investment opportunities. Attention was also paid to the investment environment in Ukraine, which has undergone significant changes as a result of the war in 2022-2024. The authors highlighted the shift in investment focus from traditional sectors, such as business centres and infrastructure, to the defence industry, and predict the economic recovery after the conflict ends. Scoring methodologies, quantitative and qualitative methods of investment project evaluation were considered

**Keywords:** risk minimisation; financial scoring; investment efficiency; market conditions; risk assessment

## Introduction

As the complexity of economic conditions increases, so does the need to minimise risks and strive to maximise the return on investment. Risks can include both the possibility of losing money due to project inefficiency and underestimating the potential of promising investment opportunities. Investors face various types of risks, ranging from financial and technical problems to changes in political or market conditions. Minimising these risks and maximising returns become important tasks for any investor. This requires analysing and evaluating the risks and opportunities associated with each specific project. Anticipating possible difficulties and identifying ways to avoid or mitigate them are key to ensuring a successful investment. The investment environment in Ukraine has undergone significant changes as a result of the war. Instead of demand for business centres, retail chains, infrastructure, or energy, defence-related projects are currently seeing the most development. Nevertheless, there is a general belief that Ukraine's post-conflict recovery is beginning. A significant amount of investment is also expected in the restoration, expansion and modernisation of infrastructure, industry, energy and other sectors.

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expansion, the most common types of financing for various projects are lending and venture capital investment (Venture capital investments, n.d.). Scholars M. Kostiukova & V. Haliasovskyi (2021) and I. Behal (2023) have extensively studied the challenges of using scoring methods for evaluating investment projects. Recent work has also been published by W. Wu (2023), S. Guang *et al*. (2024), and J. Xiao *et al*. (2024). The article emphasised the importance of improving the methodologies underlying ESG ratings, especially in the face of uncertainty, and suggested that integrating these approaches can improve the decision-making process for sustainability-oriented investors. Research of the issue of effective investment has been conducted by L. Mo (2023) and G. Babaei & S. Bamdad (2023). Other notable authors include S.S. Rawat *et al*. (2023). N. Chiadamrong (2024) considered approaches to the assessment of economic benefits from increasing the discriminatory ability of scoring models on which risk management is based. This author economically justified the costs of investment resources aimed at improving the models and their technical resources aimed at improving the models and their technical implementation in credit business processes.

It is predicted that after the war ends, Ukraine will begin an active process of economic and infrastructure recovery. This will open up new opportunities for investment in various sectors, including those that were most affected by the conflict. Investors are expected to find attractive business development and profit opportunities in Ukraine's recovering economic environment. Thus, effective investment in Ukraine will require careful analysis of risks and prospects, assessment of market trends and potential opportunities. Investors who are able to correctly assess and respond to changes in the investment environment will have a greater chance of success as Ukraine's economy begins to recover. Investments can be raised from entrepreneurs' own funds, venture capital investments, angel investments, crowdfunding, and bank loans (What is the difference..., 2018). It is important to minimise risks and choose strategies that maximise profits. Such strategies are important for finding new methods for their evaluation and management. The goal of this article was to create a practical and user-friendly scoring system for assessing and ranking investment projects based on their appeal and likelihood of success, and to apply this evaluation in determining whether to proceed with a more detailed analysis of specific projects.

## Materials and Methods

The paper employed a comprehensive set of methods to evaluate start-ups, combining both quantitative and qualitative approaches. These methods included discounted cash flows (DCF), real options analysis, expert estimates, hierarchy analysis, and the Bill Payne method, all of which contributed to a more nuanced evaluation of investment opportunities. The core of the evaluation process revolved around two key components: criteria and weighting factors. Evaluation criteria typically encompass dimensions such as profitability, risk, strategic relevance, and social impact, each of which was assigned a percentage weight based on its relative importance. The sum of these weights always equals 100%, reflecting the company's strategic priorities.

In addition to financial metrics, the evaluation system integrated non-financial criteria, recognising that the success of a start-up is influenced by factors beyond profitability alone. Weighted scores were calculated for each criterion, and used to rank the projects, providing a structured method for comparing competing investment options. The process of determining criteria and weights should be collaborative, involving key stakeholders to ensure that the evaluation framework aligns with the organisation's goals. This system must be flexible, with periodic reviews to adapt to changing priorities or market conditions. A wide range of financial methods were used to assess investment projects, including well-established techniques like Net Present Value (NPV), Internal Rate of Return (IRR), Payback Period, Discounted Payback Period, Profitability Index (PI), Modified Internal Rate of Return (MIRR), Accounting Rate of Return (ARR), Real Options Analysis, Break-Even Analysis, and Cost-Benefit Analysis (CBA). Each of these methods had distinct advantages and limitations. For example, NPV provided a direct measure of the dollar value an investment is expected to generate, but it may not fully capture the flexibility of an investment under uncertainty, where real options analysis might be more applicable. IRR helped assess the return rate but may lead to conflicting decisions when comparing projects with different sizes or time frames.

Scoring methods, also referred to as capital scoring or project scoring, served as an essential tool in evaluating and ranking multiple investment projects. The key steps in scoring involved defining the evaluation criteria, assigning weights to each criterion, scoring each project against these criteria, and calculating the weighted scores to rank the projects accordingly. This ranking process provided a clear basis for decision-making, allowing companies to allocate capital to the most promising ventures. A multi-criteria, multi-method approach provided a more balanced view of potential investment opportunities, accounting for both financial performance and broader, strategic considerations. This comprehensive evaluation process not only enhances the decision-making framework but also allows businesses to optimise their capital allocation, ensuring that resources are directed toward projects with the best risk-return profiles, strategic alignment, and potential for long-term growth. Financial scoring was used to calculate a composite index that comprehensively demonstrates the state of a company's liquidity, solvency, profitability, and business activity. For example, it can be considered the methodology developed by YouControl (Financial scoring methodology..., n.d.) that calculates the FinScore index. This model takes into account several dozen empirically identified factors and used formulas to calculate a quantitative score for the company in question. In general, as with any scoring model, the Finscore index is calculated using the formula:

$$F = \sum_{i=1}^{n} F_i \times w_i, \quad (1)$$

where $w_i$ – factor weight, $0 < w_i < 1$; $\sum_{i=1}^{n} W_i = 1$ (importance coefficient); $F_i$ – the score obtained for a particular factor. The authors have proposed the following main components of the proposed methodology. It is a system for evaluating investment projects based on several factors. In it, the evaluation is divided into three main areas: team, market, and product, with each area containing certain criteria. This is how the system is set up and how the evaluation works. Factors are used for comparison: the evaluation is based on various key factors such as team composition, market conditions and product characteristics. Each factor has its own scoring criteria that reflect the quality or status of that factor for a particular project. Each factor is assigned a score from 1 to 3 based on predefined quality descriptions: least favourable condition (e.g., lack of experience or low market size); moderate or acceptable condition; most favourable or optimal condition (e.g., highly skilled team or high market demand). Some factors were assigned a factor, which is a weight that indicates the importance of the factor in the overall assessment.

## Results and Discussion

The success of an investment project depends on several key factors. The competence and experience of the team play a crucial role in solving problems and adapting to challenges, which ensures the smooth implementation of the project. A thorough market analysis helps to identify the target audience, trends and competition, which gives an idea of the potential success of the project. It is necessary to assess the innovation and uniqueness of the product to ensure that it meets the client's needs and stands out from the competition. Assessing financial, technical, and legal risks is important to anticipate problems. Effective risk management strategies help reduce threats and increase the likelihood of project success.

Ukraine's investment environment has undergone profound changes due to the ongoing war with Russia, which began in February 2022. Prior to the conflict, Ukraine had been on a path of economic reforms and opening up to foreign direct investment, especially after the 2014 crisis. The war has created an extremely challenging environment for both Ukrainian and foreign investors. Despite these difficulties, there are emerging opportunities in specific sectors and a sense of optimism for future recovery. Ukraine's investment environment has shifted dramatically due to the war, marked by economic challenges and heightened risks. Opportunities exist in key sectors like infrastructure, energy, agriculture, and technology, particularly for those who are strategically positioned to participate in the post-war recovery and reconstruction efforts. The success of future investments will largely depend on the duration of the conflict, international support, and Ukraine's ability to implement reforms and rebuild its economy in the coming years.

Among the life stages of an investment project, there are several stages that begin with the formation of an idea and end with the operation stage. Each of these stages plays an important role in the development of the project and requires a careful approach to achieve a successful outcome. Formation of the idea: the first stage is the emergence of an idea. At this time, the team identifies a need or opportunity for a new project. The idea can come from many sources – from internal company needs to external market opportunities. Preliminary analysis: once an idea has been generated, a preliminary analysis is conducted to assess its viability and potential benefit. This stage includes assessing the risks, cost, and potential impact on the organisation or market. Making a decision on implementation: after a successful analysis of the idea, a decision is made to implement the project. This includes deciding on funding, timing, and overall strategic benefits. Planning: the planning phase develops a detailed strategy for the project, including resource allocation, schedule, and milestones. Funding: once the plan is in place, the project needs to be funded. This stage may involve finding investors or tapping into the company's internal resources. Implementation: at this stage, the project becomes a reality, and work begins according to plan. Start of operation: when a project is completed, it is put into operation. This means that the project begins to deliver the planned results or benefits to the organisation or market.

A large number of ideas and proposals require careful analysis and evaluation of their attractiveness before implementation. The analysis at the preliminary stages allows to identify potential problems and difficulties that may make it difficult to adequately evaluate the project. Solving these problems at an early stage helps to reduce risks and increase the chances of project success in the future. There are quantitative and qualitative methods for evaluating both investment projects and borrowers seeking assistance from either banks or investors. Qualitative methods can also be divided into expert and scoring methods (or ranking, evaluation by many criteria). Credit scoring systems are used almost everywhere in banks. However, they may differ in some nuances, but their main purpose is always to determine the integrity and reliability of a potential borrower. In a broader sense, scoring systems in banks are aimed at ensuring the successful operation of institutions both for personal loans and other lending options – commercial (business) loans, mortgages, car loans. Credit scoring in banks answers 2 main questions – how reliable and creditworthy a client is. Leading financial institutions are now using innovative developments that include artificial intelligence, processing of statistical data from customer databases using neural networks, blockchain, etc (Behal, 2023).

These systems operate as follows. Customer data is collected, which may include age, marital status, education, place of residence, credit history, place of work and position, number of children, and many other parameters, on the basis of which a mathematical model is built to establish a certain rating in points for each borrower. The higher the rating, the more likely the borrower is to successfully repay the loan to the bank. Accordingly, if the rating falls below a certain threshold, the bank may either refuse to grant the loan or set more stringent conditions for repayment, collateral or guarantee, or interest rate. The most well-known systems are Fair Isaak Corporation (FICO) and VantageScore. Also, it should be noted that there are 2 areas of credit scoring, namely: application scoring, which assesses the client's creditworthiness; fraud scoring, which assesses the likelihood of fraud. The main differences between lending and venture capital investment were presented in Table 1.

**Table 1.** Characteristics of differences between lending and investment

| Characteristics | Crediting | Investing |
|---|---|---|
| Payment | When lending, you need to repay not only the amount borrowed, but also additional interest (which is often significant) for using these funds. The interest may be fixed or vary according to the market rate. | In an investment, capital is invested by an investor without the expectation of an immediate return. The investor expects to receive a share of the profits from the enterprise's activities in the future. |
| Maturity dates | The borrower must make loan payments (capital and interest) in accordance with the terms of the agreement, which are usually specified in the contract. Violation of the terms may result in penalties or increased interest. | The investor expects to receive a return only after the company starts generating profits. The return on investment can be long and depends on the success of the business. |
| Bail/guarantee | When granting a loan, banks often require collateral (e.g., a pledge of property or a personal guarantee) to ensure repayment of the loan in the event of the borrower's insolvency. | Investors usually do not require collateral or a guarantee, but may evaluate the business and analyse its potential before investing. |
| Impact on business | Creditors do not have any influence on the strategy or management of the company; they only provide financial resources under certain conditions. | Investors, as owners of a stake in a business, can have a certain influence on the development strategy and decision-making. |
| Terms of cooperation | After the loan is repaid, the relationship with the lender is terminated unless a new agreement is concluded. | Investors retain their stake in the business throughout the entire period of cooperation, can provide advice and be active participants in business processes. |
| Percentage of profit | The loan does not provide for the lender's participation in the company's profits; the lender receives only repayment of the borrowed funds and interest. | The investor receives a percentage of the company's profits, which can be a significant amount if the business is successful. |
| Rules in case of bankruptcy | In the event of a borrower's bankruptcy, the creditor has priority access to debt repayment, regardless of the financial condition of the company. | Investor's risk losing their investment in the event of a company's bankruptcy, but may have certain rights to the company's assets in the event of liquidation. |

**Source:** compiled by the authors

Both the first and the second methods use certain sets of factors about the client in their calculations and allow them to evaluate anyone by calculating the appropriate number of points to make a decision on whether or not to grant a loan. It should also be added that there are also "stop factors" in scoring methods, which are guaranteed to result in a loan being denied – these can be a prison sentence, outstanding (or past due) loans, or other factors (Financial scoring methodology..., n.d.). Thus, the above scoring model allows to form a certain rating of companies by assessing their financial stability. According to YouControl's reports on the history of defaults of Ukrainian companies in 2015-2020, 55-61% of companies in the FinScore "D" group used to be bankrupt, while only 3-5% of companies were in the "A" group (Financial scoring methodology..., n.d.).

This means that any rating calculated using any scoring system is not a guarantee of success or failure, but is primarily a reflection of the probability of a positive or negative outcome (Efimova, 2021). Investment research does have its own peculiarities, especially when it comes to new projects and innovative ideas. There are several key aspects to consider. New project risk: new projects have no operating history, so their prospects may be uncertain. It is difficult for investors to assess whether the sales volume, the quality of the team, and the correctness of the calculations will be achieved. The need for additional analysis: investors should carefully research new projects, paying attention to aspects such as the team, market potential, competitive advantages and go-to-market strategy. Innovation as a risk factor: innovative projects can be difficult to evaluate due to their uniqueness and unpredictability. Investors should be prepared for a high level of risk. Importance of research: investors should study the market, technological trends and other factors to make informed decisions (Early-stage valuation methods..., n.d.; Kostiukova & Haliasovskyi, 2021; Rawat *et al.*, 2023).

Investment research on new projects requires more in-depth analysis and risk-taking, but it can lead to high rewards in the future. In addition to scoring, a variety of quantitative methods are used to evaluate investment projects, which have their advantages and limitations. They are usually characterised by simplicity, speed, and versatility, but they also have certain disadvantages. One of the most common methods is DCF. This method involves determining the present value of a project's future cash flows based on the time value of money. DCF is a powerful tool, but its use requires accurate forecasts of future revenues and expenses, which can be difficult in the case of a large number of external factors and risks (Brealey *et al.*, 2020). The authors also used the real options method, which allows to evaluate investment projects as financial options with the possibility of changing the strategy in the future. This approach allows for a more flexible response to changing conditions and market risks, but requires complex mathematical calculations.

Other quantitative methods include cost sensitivity analysis, statistical methods, and others. Their main advantages are efficiency and the ability to obtain numerical results. However, such methods often do not take into account the human factor, the complexity of assessing external influences and risks, and require a large amount of data. The disadvantages of quantitative methods are the limited criteria taken into account in the evaluation and the tendency to rank projects by numerical indicators rather than by the quality of a particular project. The evaluation of investment projects using quantitative methods should be supplemented by quality and risk analysis, which allows for a more complete picture of the project's potential before making an investment decision.

Qualitative methods for evaluating investment projects, such as expert evaluation, hierarchy analysis methodology (HAM), Strategic Technology Assessment Review (STAR), and Industrial Research Institute Technique (IRI), have both significant advantages and disadvantages that should be considered. One of the main advantages is the use of expert experience and intuition. These methods allow the application of expert knowledge and experience, which is important for evaluating complex investment projects, especially those that involve innovation or technological challenges. Another advantage is the ability to assess risks and the human factor. Qualitative methods make it possible to consider risks associated with human factors, such as expert evaluations of potential problems or selecting the best way to implement a project. A further benefit is that these methods do not require large amounts of statistical information. Compared to quantitative methods, qualitative approaches can be effective even when there is insufficient data to build mathematical models.

Qualitative methods of evaluating investment projects have several drawbacks. Experts' assessments can be subjective and depend on personal experience and views, which can lead to unpredictable results. Depending on the complexity of the project, it can be difficult to find competent experts, especially for innovative technologies or markets. It is important to determine how competent an expert is in a particular field or project, as this can affect the reliability of the assessment. There is also a risk that experts may have personal interests or biases that may influence their evaluation of the project. The views of an influential expert can affect decision-making, which may result in the selection of suboptimal strategies or projects. In general, qualitative assessment methods are a useful tool to complement quantitative approaches, but their use requires careful analysis, control over subjectivity, and caution in selecting experts (Guang *et al.*, 2024).

Scoring methodologies, such as the Brooks Method, Bill Payne Method, Flagship Pioneering, Ioniq, M13, Rocket-internet, and others, are designed to evaluate investment projects based on a set of quantitative and qualitative criteria. They provide an opportunity to combine different types of indicators and evaluation methods, which allows to get a comprehensive view of the project's potential. One of the main advantages of scoring methods is their ease of use. For example, they can be implemented in the form of questionnaires or rating scales, which simplifies the process of data collection and analysis. In addition, they can be customised to take into account specific regional characteristics, industry trends, or market conditions, making them more adaptable and effective in specific situations.

Scoring methods have certain drawbacks. A serious challenge is the difficulty of building a universal scoring model, as different projects may require different sets of criteria for evaluation. There is also a certain subjectivity in the assessment of some qualitative factors, as they can be interpreted differently by different evaluators. Despite these shortcomings, scoring methodologies remain an important tool for making decisions about project investments. They allow to systematise and analyse a large amount of data, providing an objective approach to determining the potential and risks of a project. To ensure the best results, it is important to constantly improve scoring models, taking into account specific conditions and circumstances in accordance with the market situation and industry requirements.

Among the existing ones, some methodologies attract attention for its fairly universal approach to evaluating new start-ups. This method is based on comparing the company in question with other already operating start-ups and adjusts the appropriate coefficients for key indicators to obtain a preliminary assessment of the new project. The main idea behind the methodology is that by comparing it to existing start-ups, one can understand the potential opportunities and benefits of a new project. This allows investors and market scouts to get a better idea of how a new start-up can fit into the existing ecosystem and how it can fulfil its goals. Evaluating a new start-up by comparing it to similar projects allows you to draw reasonable conclusions about its potential and competitiveness. Taking into account key indicators and adjusting coefficients allows for a more objective assessment, which contributes to making better decisions about investing in and developing start-ups.

The methodology was described in several stages. Several key criteria are selected that the investor and the team consider important for evaluating the start-up. These criteria can include parameters such as market size, team, technology, and potential profits. Other start-ups with similar characteristics are identified for comparison. These can be companies from the same industry or with similar products or services. The new start-up is then compared to these similar projects. After that, scoring is conducted. Each start-up is evaluated for each criterion, and points are assigned based on their importance. For example, if the team is considered the most important factor, more points are given to start-ups with a strong team. The total score is calculated by summing up the points for all criteria. This score determines the evaluation of the new start-up according to the Bill Payne method. The authors proposed a simplified scoring methodology of the team, market, product, risk (TMPR), which allows for a preliminary assessment of the project by the investor. The simplified scoring methodology of the team, market, product, risk (TMPR) is an effective tool for preliminary assessment of an investment project. It is proposed to consider the main components of the proposed methodology:

1. Team: the quality and experience of the team is an important factor in the success of the project. A preliminary assessment of the management's competence and ability to plan well, the effectiveness of team communication, and the level of motivation is required. To do this, it will not be superfluous to ask about previous experience, familiarise yourself with previously developed work procedures, schedules, and reports. A strong team is able to effectively solve emerging problems and adapt to changes, which ensures the successful implementation of the project.

2. Market: market assessment determines the potential demand for the product or service offered by the project. Investors analyse the size of the target audience, trends, and the competitive environment. The larger the market and the less competition, the more opportunities for project success. The best result is achieved if you have in-house competence in this area or access to up-to-date market research.

3. Product: the quality of the product or service is also important. It is necessary to evaluate the innovation, usefulness and uniqueness of the project proposal for future clients. A high-quality product ensures that it is differentiated from competitors and meets the needs of the target audience.

4. Risk: risk assessment allows you to predict possible difficulties and threats to the success of the project. It requires an analysis of financial, technical, legal and other risks that may affect the implementation of the investment project. Effective risk management and development of minimisation strategies are key success factors.

Together, these four criteria provide investors with a comprehensive view of the project's potential and allow them to make informed decisions about further investment. The calculation was based on the formula:

$$S = \frac{\left(\sum_{i=1}^{3} c_i x + \sum_{j=1}^{4} m_j y + \sum_{n=1}^{6} p_n z\right) \times 1}{R}, \quad (2)$$

where $c_i$, $m_j$, $p_n$ is the score of the corresponding parameter in points from 1 to 3; $x$, $y$, $z$ – coefficients reflecting the importance of such blocks as "team", "market", "product"; $R$ – risk coefficient.

To calculate the risk factor, it is necessary to accept the following classification:

1. Financial risks:

1.1 Credit risks: related to the possibility of losses due to non-payment or delayed payment of financial obligations by customers.

1.2 Liquidity risk: arises from uncertainty in the future prompt realisation of assets at the stipulated price.

1.3 Currency risks: caused by uncertainty of future movements of the national currency exchange rates against foreign currencies.

2. Technical risks:

2.1 Risk of cost overruns: the design and estimate cost may be exceeded due to the fault of many participants in the investment process.

2.2 The risk of untimely completion of the investment absorption period: arises due to changes in the composition of projects and disruptions in the supply of material and technical resources.

2.3 Risk of breach of contract: depends on the investor's financial insolvency, changes in taxation conditions and other factors.

3. Operational risks:

3.1 Risk of sales of products, works, services: arises due to the possibility of narrowing of the sales market and loss of some consumers due to competition and the emergence of higher quality goods after the facility is put into operation.

For each of the risks, its significance is predicted according to the Table 2, and then the overall average risk value from 1 to 8 is calculated.

**Table 2.** Risk matrix

| | Unlikely | Probable | Highly likely | Guaranteed |
|---|---|---|---|---|
| Low impact | 1 | 2 | 3 | 5 |
| Average impact | 2 | 3 | 4 | 6 |
| High impact | 3 | 4 | 6 | 7 |
| Catastrophic impact | 4 | 6 | 7 | 8 |

**Source:** created by the authors based on M. Kostiukova & V. Haliasovskyi (2021)

The classification of risks includes several categories. Financial risks encompass concerns like credit risks, where customers may delay or fail to meet payment obligations, and liquidity risks, which relate to uncertainties about how easily assets can be converted to cash at expected prices. Technical risks involve potential cost overruns from errors by project participants and delays in project completion due to issues like disrupted material supply chains. Operational risks focus on market dynamics, such as losing customers or facing stiffer competition, which could affect product or service sales after a facility becomes operational. Each risk is assessed for its significance, and an overall risk factor is calculated based on its likelihood and impact using a matrix. The risk matrix categorises risks based on both their likelihood and impact. The likelihood ranges from "Unlikely" to "Guaranteed", while the impact levels span from "Low" to "Catastrophic". Risks are rated on a scale from 1 to 8, where higher scores indicate more significant risks. For instance, a "Guaranteed" event with "Catastrophic impact" is rated 8, representing the highest possible risk. The system of scoring investment projects was considered (Table 3).

**Table 3.** Proposed scoring system for investment project evaluation

| Factors for comparison | | | | | Score | | Coefficient |
|---|---|---|---|---|---|---|---|
| **Number of scores** | | **3** | **2** | **1** | **min** | **max** | |
| **Team** | Availability of a team | All the necessary specialists | Majority of specialists | Specialists should be sought in the labour market | 1 | 3 | 0.4 |
| | Quality of the team | Successful experience and reputation in implementing similar projects | Unconfirmed experience | No experience | 1 | 3 | |
| | Motivation of the team | Confidence in success, willingness to participate with their own funds in significant amounts | Confidence in success, not ready to invest | No guarantee of success, not ready to invest | 1 | 3 | |
| **Market** | Volume of the market | 1 billion euros and more | 100 million euros and more | up to EUR 100 million | 1 | 3 | 0.3 |
| | Market growth | More than 10% for the year | From 5 to 10% per year | Up to 5% per year | 1 | 3 | |
| | Competitive environment | Highly competitive market | Moderate level of concentration | Existing oligopoly | 1 | 3 | |
| | Availability of sales channels | There is an extensive network to implement | There are sales channels, but in small numbers | There are no sales channels, the issue has not been finalised | 1 | 3 | |
| | Expected liquidity of investments | High liquidity, the project can be closed without significant financial losses | Medium liquidity, the project can be closed with financial losses not exceeding 50% of the investment | Little liquidity or complete loss of investment in case of project failure | 1 | 3 | |
| **Product** | Demand | It is needed often; it is needed by everyone | Needed by certain categories of people | Only a small segment of the population needs it | 1 | 3 | 0.3 |
| | Competitive advantage and product uniqueness | The product is unique or superior to similar ones by some criteria | The product is better than its analogues in some of the criteria | The product is not fundamentally different from the existing ones | 1 | 3 | |
| | Ability to produce the product | The ability to start production in a short period of time (0-6 months) | The ability to start production in an average (6-12 months) period of time | 1 year or more to start production | 1 | 3 | |
| | Production profitability | Profitability is above 50% | Profitability from 10 to 50% | Profitability is less than 10% | 1 | 3 | |
| | Availability of test samples | Test sample | The test sample is being finalised | There is no test model, only a theoretical idea | 1 | 3 | |
| | Ability to implement the technical component of the project | Possibility | The need for minor research | Extensive research to confirm theoretical calculations | 1 | 3 | |
| Calculating the minimum and maximum possible number of points: | | | | | **4.5** | **13.5** | |

**Source:** compiled by the authors

The lowest possible score, taking into account the risk, can be 0.56, and the highest 13.5 points. This calculation allows an investor to make a quick preliminary analysis of a start-up relative to others before spending time and resources on in-depth project research, further communication with project initiators, development of a feasibility study, and other stages. A.O. Scott *et al*. (2024) believe that traditional methods of assessing and managing credit risk, such as credit scoring and historical data analysis, are no longer sufficient to meet the complex challenges of financial markets to meet the complex challenges of financial markets. Advanced risk management solutions offer more robust and dynamic tools to identify, assess and mitigate credit risk. One of the key advances in this area is the integration of big data and machine learning algorithms. N. Chiadamrong & P. Suthamanondh (2024) considered multi-objective problems under uncertainty where financial gain and risk from uncertainty are trade-offs. The authors use chance-constrained programming to defuzzification and solve uncertain optimisation problems under a given confidence level. R. González-Pozo *et al*. (2024) reviewed a proposal to improve the ESG methodology used by rating agencies. In other words, they discuss the challenges faced by financial investors in the context of global uncertainty and growing interest in sustainable investments, with a focus on environmental, social and governance (ESG) indicators. ESG indicators are increasingly being used as a tool to assess companies' sustainability practices. However, the methodology of these indicators, which are often provided by rating agencies, can be unclear, making it difficult for investors to make decisions.

M. Caldeira & F.H. Pereira (2022) focused on ESG, while V. Kobets (2022) incorporated MCDM with automation and J. Cao & F. Xu (2022) used entropy-based fuzzy logic for high uncertainty environments. All three studies focused on investment decision-making, using advanced methodologies (ESG scoring, MCDM with robotic advisors, and fuzzy TOPSIS) to optimise responsible and informed investment choices. The research is applied to a variety of industries, illustrating the versatility of decision support systems across sectors. V. Kobets & O. Berehovyi (2022) presented a software-based solution to assess the attractiveness of investment projects. Their work highlights the technical aspects of developing assessment tools that can assist stakeholders in identifying viable projects. The authors focus on integrating diverse economic indicators to enhance decision-making processes, underscoring the role of ICT in streamlining investment evaluations. Ecological transition through the green investment financial tool (GIFT). L. Becchetti *et al*. (2022) delved into the integration of ecological factors in investment assessment by proposing the GIFT. By prioritising ecological metrics, the GIFT approach represents a response to global calls for greener investment practices. This approach is especially relevant in the context of the ongoing ecological transition, as it helps align investment strategies with sustainable development goals (SDGs). The study highlights the need for tools that not only assess financial returns but also evaluate the environmental impact, offering a dual-benefit framework for investors. Fuzzy multi-criteria evaluation for investment projects E. Aliyev *et al*. (2022) introduced a multi-criteria evaluation methodology based on fuzzy logic. This technique is particularly valuable for projects with multiple competing criteria where subjective judgment plays a role. The fuzzy evaluation method provides a more flexible and nuanced decision-making model, which is especially beneficial in environments with ambiguous or incomplete data. This work contributes a novel mathematical framework for investment project evaluation, addressing both quantitative and qualitative factors and enhancing the robustness of investment decisions. The authors discussed their advantages, such as ease of use, speed and versatility, as well as disadvantages, including the limited criteria considered in the evaluation and the tendency to rank projects by numerical indicators. The authors emphasised the importance of careful analysis of risks and prospects, assessment of market trends and potential opportunities for successful investment, which are the main focus of the article.

Quantitative methods, such as DCF and the option pricing method, are powerful tools, but they require accurate forecasts and can be difficult to use due to external factors and risks. Qualitative methods, such as expert judgment and hierarchy analysis, allow for human factors and intuition, but can be subjective and depend on the experience and opinions of experts. The authors emphasise that to obtain the best results, it is important to combine quantitative and qualitative methods to ensure a comprehensive approach to the evaluation of investment projects. The article discussed the methods used to evaluate new startups. The classification of risks and principles of their calculation are considered. A simplified scoring methodology of the CRPR is proposed, which allows investors to evaluate four main criteria of an investment project: team, market, product, and risk. The authors proposed a formula for calculating the scoring, which includes an assessment of these criteria and a risk factor. The article provided valuable insights for investors seeking to understand and evaluate investment projects in a changing economic environment, with a focus on the Ukrainian context.

## Conclusions

The article presented a simplified mathematical model for comparing and ranking investment projects, which can be used to develop customised evaluation techniques. Effective investment has become increasingly important in modern economic conditions, emphasising the need to minimise risks and maximise returns. The investment environment in Ukraine has undergone significant changes due to the war, with defence-related projects receiving the greatest attention and development. It is generally expected that Ukraine will recover after the conflict ends, leading to significant investment in infrastructure, industry, energy, and other sectors. Effective investment in Ukraine will require careful risk analysis, market trend assessments, and evaluations of potential opportunities. The article compared two main types of project financing: lending and venture capital investment. Their differences were highlighted in terms of repayment conditions, collateral requirements, impacts on business, and profit distribution. The life cycle of an investment project consists of several stages, from idea formation to realisation, each playing a crucial role in the project's success.

The proposed scoring methodology evaluates and ranks investment projects based on their attractiveness and potential for success, aiding decision-making for further project development. This methodology involves four key components for evaluating a project's success: team, market, product, and risk. A competent and experienced team is essential for problem-solving and adapting to changes. Market assessment identifies demand, audience size, and competition to evaluate growth potential. Product quality, innovation, and differentiation are vital for attracting and retaining customers. Thorough risk analysis anticipates challenges and develops effective mitigation strategies. Several areas for further research were identified. Refining the scoring model by incorporating additional criteria and dynamically adjusting weights based on sector trends or macroeconomic factors could enhance its effectiveness. Expanding its scope by applying the model to various contexts, such as emerging technologies or sustainable development projects, could assess its adaptability across sectors. Comparative studies with other established evaluation methods could offer insights into its predictive accuracy and highlight areas for improvement. Longitudinal studies could track the long-term success of projects selected using the model to evaluate its validity. Integrating machine learning algorithms could enhance the model's ability to analyse large datasets, identify patterns, and improve the accuracy of investment evaluations.

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## Conflict of Interest

None.

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## Використання скорингових методик для оцінювання інвестиційних проектів

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**Анотація.** Метою дослідження була розробка бальної методики оцінки та ранжування інвестиційних проектів за їх привабливістю та потенційною успішністю, а також використання цієї оцінки для виявлення більш ефективних проектів. У статті наведено методику розрахунку можливих ризиків для подальшого використання при ранжуванні проектів. Представлено спрощену математичну модель для порівняння інвестиційних проектів та їх ранжування. Модель може бути використана при розробці власних методів оцінки. У статті розглянуто такі методи, як дисконтований грошовий потік, метод реальних опціонів, метод експертних оцінок, аналіз ієрархій та метод Білла Пейна для оцінки стартапів. Ключовими елементами процесу оцінки були визначення критеріїв та вагових коефіцієнтів. Критерії включали важливі показники оцінки (наприклад, прибутковість, ризик, стратегічна важливість, соціальний вплив). Кожен критерій мав вагу у відсотках на підставі відносної важливості, а загальна вага могла досягати 100 %. У статті розглянуто ключові аспекти ефективного інвестування з акцентом на необхідності мінімізації ризиків та прагненні до максимізації прибутку. Проаналізовано різні види ризиків, які можуть включати втрату коштів через неефективність проекту або недооцінку потенціалу перспективних інвестиційних можливостей. Увагу приділено інвестиційному середовищу в Україні, яке зазнало значних змін внаслідок війни у 2022-2024 роках. Авторами підкреслено зміщення інвестиційного фокусу з традиційних секторів, таких як бізнес-центри та інфраструктура, до оборонної промисловості та прогнозовано відновлення економіки після завершення конфлікту. Розглянуто скорингові методології, кількісні та якісні методи оцінки інвестиційних проектів

**Ключові слова:** мінімізація ризиків; фінансовий скоринг; ефективність інвестицій; ринкові умови; оцінка ризиків