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ASSESSING THE SOCIAL UTILITY OF BUSINESS MEASURES FINANCED BY ESI FUNDS

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Summary

The utilisation of the 2021-2030 European structural and investment funds in Lithuania is gaining momentum, underscoring the necessity for comprehensive deployment of these funds. It is imperative to ensure that the funds facilitate specialised areas and encompass multidirectional funding and advantages for the state, its populace, and enterprises. Given the need for further advancement in Lithuania's social business sector, the responsibility for delivering public goods rests with the Government of the Republic of Lithuania and other pertinent entities. Lithuania should capitalise on the opportunity presented by European Union investments to foster the establishment and provision of social utility. In this context, the author aims to identify the most relevant approach for evaluating the social utility of EU-funded business initiatives by applying the TOPSIS multi-criteria technique. Application of the latter affirms that this aim can be attained by directing investments toward social business and generating public goods. Leveraging private operators, the primary beneficiaries of the investment, to expand their operations and enhance profitability can also create positive social utility as an ancillary utility devoid of additional losses or encumbrances. Consequently, the findings also reveal opportunities for applying the approach in evaluating public and private investments in diverse economies worldwide.

Key words. European structural and investment funds (ESI funds), social utility, business financing instruments, public goods, multi-criteria methods, expert evaluation.

1. Introduction

Lithuania's EU membership offers significant utility through cohesion policy and European structural and investment (ESI) funds, which are crucial in driving the country's economy. In Lithuania, €6.709 billion has been allocated to implement the priorities and objectives of the 2021-2030 National Progress Programme (Savickas, 2021). Most of this investment will support private farms to enhance their competitiveness, efficiency, expansion, adaptation to market changes, new product development, and scientific experimentation. These business-focused activities, funded by ESI funds, emphasise the need to evaluate social utility in EU business funding measures, an emerging and relevant area for decision-making in planning and implementing investments and measures to address business interests and societal needs.

Social utility denotes the beneficial impact of economic activities on society. Presently, a predominant focus on amplifying production outputs and financial gains has led to the neglect of the social and environmental repercussions, underscoring the pressing contemporary relevance of emphasising social utility promotion and its associated facets. Within this context, aligning entrepreneur objectives and allocating available ESI funds towards fostering a positive spillover effect, i.e., engendering social utility through business financing, becomes feasible. Nevertheless, the subjective nature of defining and measuring social utility poses challenges. Additionally, private and public investments necessitate the navigation of competing priorities encompassing economic growth, environmental conservation, social welfare, and public health, engendering formidable trade-offs. These trade-offs may warrant information asymmetry due to the intricacy and specificity of technical and economic investment data.

Consequently, the assessment of investments' social utility is intricate due to the absence of explicit metrics and methodologies, compounded by insufficient comprehensive scholarly research in this domain. Hence, the imperative for formulating efficacious assessment frameworks and metrics is underscored. Following this exigency, the object of the paper is the social utility. In this regard, the author focuses on scrutinising the assessment of social utility in business projects, with the aim of identifying the most pertinent approach for evaluating the social utility of EU-funded business initiatives. Respectively, the objectives of the research are as follows:

To analyse the theoretical aspects of social utility and methods of measuring them.

To develop a combined approach to assessing the social utility of EU-funded business measures.

To assess the social utility of EU-funded business measures in an experimental setting.

This article is divided into four parts. The second part focuses on the assessment options for assessing the social utility of business instruments financed by ESI funds. It reveals the assessment methodology based on applying the TOPSIS multicriteria technique. Part 3 provides the results and discusses the main findings of using the proposed methodology for assessing the social utility of business measures financed by ESI funds. The final section presents conclusions and insights for future research.

2. Options for assessing the social utility of business projects financed by ESI funds

During the 2021-2030 EU funding period, direct investments reached businesses mainly through measures administered by the Ministry of Economy of the Republic of Lithuania (the Ministry of Economy). During the investment period under review, the Ministry of Economy administers EUR 1.026 billion, of which as much as EUR 534 million is directly targeted at business development (promotion and development of the competitiveness of small and medium-sized enterprises). All 20 measures developed by the Ministry of Economy in the business area of National Progress Programme (Savickas, 2021) Priority 3, "Promoting the Competitiveness of Small and Medium-sized Enterprises (SMEs)" (including two financial measures and five global grant measures) are divided into four main investment objectives:

1. Specific objective 3.1.1 "Increase the level of entrepreneurship",
2. Specific objective 3.2.1 "Increase internationalisation of SMEs",
3. Specific objective 3.3.1 "Increase productivity of SMEs",
4. Specific objective 3.3.2 "Increase SME investment in eco-innovation and other resource-efficient technologies"

All the objectives focus on creating economic infrastructure, renewing technology and technological facilities, cost-effectiveness, development, marketing measures, and investment in eco-innovation. These investments are skewed towards increasing labour productivity because of the expected lasting effects of economic growth. It is important to note that these tangible infrastructure investments not only raise incomes through the multiplier effect but also fuel domestic consumption, i.e. the investment generates a persistent but depreciating supply-side effect (Kosmopoulou & Press, 2022) and Keynesian demand growth (Murakami, 2023; Rada et al., 2023a). However, this growth in demand can only be observed when investment funds are constantly in use (Chen et al., 2024; Gupta et al., 2022). Respectively, it can be observed that supply-side growth in the domestic economic sectors also leads to increased social utility. According to counterfactual data analysis (Lithuania State Data Agency, 2023), EU funds invested during 2021-2023 created 27,000 new jobs, which led to a 2 per cent decrease in the unemployment rate in the country and an increase in the average wage by 3 per cent after the final disbursement of project funds by the beginning of 2024. It should be noted that jobs created and average wages are used to highlight the social utility of ESI funds for the public. Still, as a measure of social utility, they should be treated with extreme caution and criticism, as:

1. Unemployment is highest among those with a medium level of education and potentially minimum income, and the jobs created by ESI funds are high value, requiring specific scientific and professional skills for which a medium level of education is insufficient. Similarly, the requirements to create jobs that pay at least the national average wage are likely to disadvantage

the group of people who are most affected by unemployment, as the employer's payment of average and higher salaries will exclude them from the selection process by imposing appropriate criteria on professional and scientific knowledge and skills (Bennett et al., 2024).

2. As mentioned above, this job growth is essentially linked to Keynesian supply-side growth, i.e. a disruption in the flow of ESI funds could lead to an extreme increase in the unemployment rate (Acemoglu & Restrepo, 2018, 2019; Rada et al., 2023b), amplified by a wave of bankruptcies caused by the collapse of companies. The latter, in principle, have survived only with the help of ESI funds or have not been able to make good use of it to compete in the market.
3. Job creation criteria defined in the specifications of the measures' financing conditions and the wages to be paid may lead businesses to create artificial jobs to be selected for their projects and to achieve the indicators' results (Bahloul Zekkari, 2024).

Considering the above, the aim is to find a method that reflects tangible and lasting social utility and measures social utility not only because of business investment but also as a positive spill-over effect left over from direct funding for business. This method would positively affect society's needs without creating an additional administrative or financial burden for companies (Bennett, 2021).

Scholars (Curt et al., 2022; Maas & Rousseau, 2024) acknowledge that measuring social utility is highly complex and tricky, as research data and results are often expressed in different quantitative or qualitative units of measurement. Therefore, objective results of social utility research can be achieved by combining more than one research method, where one of them evaluates the available financial data or indicators, the other - specific aspects of the field of study, or by diversifying the object of evaluation into different levels, thus covering all the possible areas of evaluation (Su & Morsky, 2024). Measuring social utility faces a fundamental problem: What is the right size to define social utility? Since social utility is generally accepted as the positive impact of economic activity on society, it can be understood as providing public goods to the market (Wang & Huang, 2024). Still, in the case at hand, the public goods are to be provided to the market by a private economic operator with an interest in the development and profitability of its activities. Therefore, the public goods would be, in this case, a by-product of the activity/project. In this case, the social utility could be measured in monetary units, number of services provided, volume, and public satisfaction (Bo & Yi, 2024; Dabush et al., 2023). Still, such measurement methods would lead to subjectivity in the study (Vieira et al., 2020), as the social utility will be perceived differently by each aspect and by each member of the public, and given this, the social utility should be defined in terms of evaluation scores and weights, which independent experts would provide, and a final assessment would be achieved using a multicriteria approach (Azman et al., 2023).

3. Methodology for the assessment of the social utility of business measures funded by ESI funds

The evaluation approach chosen for the research in question consists of four steps: selection of experts, weighting of indicators, determination of the consistency of the experts' assessments, and determination of the results. All the stated tasks are to be solved using the Technique for Order Preference by Similarity to an Ideal Solution (TOPSIS; (Thomas et al., 2013). Expert judgment refers to quantitative assessments of processes or phenomena that cannot be measured directly. It is equally important to select the right experts for the study and to consider the selection criteria in advance. Given that the survey covers social utility and EU investments, the requirements for selecting experts should include experience working on projects with social utility and EU investments and scientific experience. To avoid subjectivity, it is essential to choose experts from all fields. To maintain the accuracy and credibility of the expert assessment, many academics recommend including a minimum of 5 experts in the panel, with an optimal panel size of 8-10 experts (Costa et al., 2019).

It has been shown that, in expert assessment models, the accuracy of the judgements and assessments of a small group of experts is equal to that of a large group of experts (Figure 1). Still, the accuracy of evaluating a group of three experts is sometimes significantly superior to that of a single or two experts. As the number of experts increases, the precision of the resulting estimates gradually increases, peaking in the group of 5-9 experts (Thomas et al., 2013).

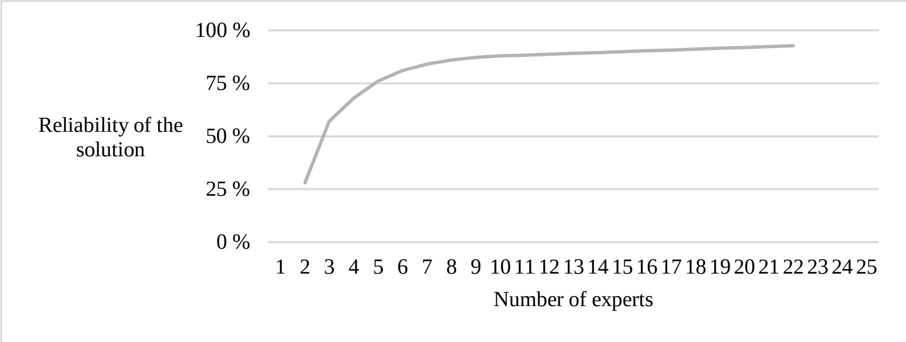

Figure 1. Impact of the number of experts on the reliability of the assessment (Kumar Behera et al., 2023; Thomas et al., 2013).

As outlined above, the evaluation will cover all business measures administered by the Ministry of Economy. As all the measures have different objectives but share a common purpose and a standard operating space, the business measures can be considered a system and evaluated in an integrated manner. At the project level, the decision on eligibility for funding is determined by the Facility Financing Conditions Description (hereafter FFCD), which sets out the requirements for projects prepared by applicants who are eligible to participate in the call for proposals for funding to be granted. The FFCD defines three core sets of requirements that applicants competing for funding must meet:

1. The project must meet the objective of the measure.
2. The funding requested for the project must be eligible for the activities supported.
3. The project must meet pre-defined selection criteria.

These screening components determine the project's eligibility and the intermediate utility-quality assessments and scores, and they are the basis for the experts' decision about whether the business projects will contribute to the creation of social utility.

The most straightforward approach is the direct assessment, where the experts provide the weights of the factors in unit fractions at once. When the number of factors is small, they give the best result (Kumar Behera et al., 2023). This method is straightforward, easy to understand and easy to apply. Unfortunately, the large number of factors makes it problematic. This is because it is becoming increasingly more difficult for an expert to determine the correct relationships between the weights of an increasing number of factors about the phenomenon under consideration. As a result, the inconsistency of opinions is increasing, often exceeding the permissible limits, and the expert survey results cannot be used for further calculations. In the search for a way out of this situation, more sophisticated but improved methods of determining factor weights have been proposed, the most used of which is the analytic hierarchy process (AHP) of Saty (Li et al., 2014; Munier & Hontoria, 2021). Its essence is that the expert must compare only two factors, only some at a time. Unfortunately, a more detailed analysis of its application shows it also needs to improve on similar shortcomings. When stating only the influence of a pair of factors on the phenomenon under investigation, because of their comparison, the expert must, however, weigh in his mind the analogous influence of all the other factors.

Where there are no more than 12 factors, the expert cannot correctly determine the influence relationships between all pairs of factors. This is evidenced by the fact that only in very few cases, and only with a minimal number of factors, does the expert complete the pairwise comparison matrix, which is the basis of the AHP method. The author of the technique, seeing and understanding this fact, foresaw that, in the event of a discrepancy between the experts' opinions, the assessment would be carried out in several stages, i.e. the experts would be shown their errors and asked to correct them. This hardly increases the accuracy of the assessment since the expert must change his opinion and give a different assessment of the factors to harmonize the matrix. As the number of factors increases, the application of the AHP method becomes practically impossible (Munier & Hontoria, 2021). Therefore, their quantification will be accurate and complete when the formations are broken down in width and depth, i. e., structured. Moreover, every such structure is a system, so its elements are interconnected.

Since it would be difficult for experts to assess all 20 instruments against these three criteria, further diversification is needed. Therefore, the social utility of the EU-funded business measures is further diversified according to the specific objectives and evaluation aspects listed above.

This division simplifies the work of the experts and contributes to more accurate results. The instruments will be diversified and evaluated according to the following aspects:

- Objective of the measure;
- Supported activities;
- Project selection criteria.

The impact of individual criteria on the objective of the object of study varies, and therefore, in the case of quantitative multi-criteria evaluations, it is essential to determine the significance of the criteria, i. e. their weights and the weighting of the impact on the social utility will be carried out in the next stage of the design of the method. The selected experts will have to assess how important each of the four specific objectives and three project evaluation aspects identified in the FFCD are in social utility generation. Most currently known and used methods for weighting the multi-criteria evaluation criteria are based on expert judgment (Liao et al., 2024). The subjective weighting of the criteria is based on the expert judgements of specialist experts. Since the opinions of individual experts are often not identical and may be contradictory, weights as aggregated averages of the experts' opinions can be used in a multi-criteria evaluation if the non-contradictory nature of the experts' assessments has been established, i.e. if it has been demonstrated that the views are statistically consistent (Kaklauskas et al., 2017; Thomas et al., 2013). Kendall's variance concordance coefficient (Ozdemir, 2024) can be used to determine the concordance of the assessments. Other scholars (Vveinhardt & Gulbovaitė, 2016) also confirm that expert judgment assumes that a decision can only be reached if there is consistency between experts' opinions. Once all the data from the expert evaluation has been collected, it is necessary to assess the compatibility of the experts' opinions. If the number of experts is less than two, a correlation coefficient can be used to calculate the level of agreement (in this case, there are eight experts); if the number of experts is more significant than two, the level of agreement between the experts in the group is indicated by the concordance coefficient.

The set of expert ratings is a matrix E $=\|e_{ij}\|$ (i = 1,..., m; j = l, ..., r), where m is the number of indicators to be compared, and r is the number of experts involved in the study (Podviezko & Podvezko, 2014). Each j-th expert evaluates each i-th indicator. Only ranking the experts' indicators is suitable for calculating the dispersion concordance coefficient. Suppose the experts assess the indicators differently. In that case, they should be pre-ranked, i. e. a ranking procedure should be carried out so that the most critical indicator is given a rank of one, the second most important one a rank of two, etc., and the last most important one a rank of m; where m is the number of indicators being compared.

As mentioned above, in the first part of the survey, the experts rank the aspects of the evaluation of the measures presented in terms of their impact in the context of the creation of social utility by assigning a number between 1 and 3, respectively one being the most influential and three being the least influential, in which case a ranking procedure is necessary and is carried out by assigning the opposite of (1) to the respective evaluation using the following equation:

$$e_{ij} = (e_{max} + 1) - e_{ijS} \quad (1)$$

here e_{ij} is the post-ranking score, $e_{\max}$ is the maximum score (in this case it is 3), e_{ijS} is the original score.

The re-ranking procedure produces re-ranked values that satisfy the requirements for calculating the variance concordance coefficient as defined by Kendall. The calculation is based on the sum of the ranks e_i of each i-th indicator across all the experts (Eq. 2), i.e. the deviation of the values e_i from the mean rank $\bar{e}$ (Eq. 4) the sum of the squares *S (analogy of variance*, Eq. 3), namely as following:

$$e_i = \sum_{j=1}^{r} e_{ij}. \ (i = 1, \dots, m) \quad (2)$$

$$S = \sum_{i=1}^{m}(e_i - \bar{e})^2. \quad (3)$$

$$\bar{e} = \frac{\sum_{i=1}^{m} e_i}{m} = \frac{\sum_{i=1}^{m}\sum_{j=1}^{r} e_{ij}}{m}. \quad (4)$$

It is theoretically possible that all the experts' assessments would be identical, in which case the experts' opinions could be considered maximally consistent S_{max} as to the following equation:

$$S_{max} = \frac{r^2 m(m^2-1)}{12}. \quad (5)$$

The latter is ideal in the case of consistency of the experts' opinions. If none of the assessments agree, the value of *S* would be zero. Suppose *S* is the sum of squares calculated using Equation 3. The concordance coefficient W in the absence of correlated ranks is defined by the ratio of the sum of squares of the mean rank *S* to the maximum concordant expert opinion S_{max} as to the 6th equation, namely as follows (Eq. 6):

$$W = \frac{12S}{r^2 m(m^2-1)} = \frac{S}{S_{max}}. \quad (6)$$

If the experts agree, the value of the concordance coefficient *W* tends to unity *W→1*; if they differ, the value of *W* tends to zero *W→0*. Kendall has shown that if the number of indicators *m> is* 7, the significance of the concordance coefficient can be determined using χ^2 Pearson's criterion (Podviezko & Podvezko, 2014). However, the emerging concept of social utility assessment of EU business measures only foresees the assessment of three key indicators. Hence, an additional study on the concordance of experts' opinions is unnecessary. The calculated ratio (Eq. 6) can be considered a reliable measure of the level of concordance of views and the determination of the weights of indicators.

In the weighting, as in the calculation of the agreement between opinions, the results of the experts' assessments are marked e_{ij} and placed in the matrix $E = \|e_{ij}\|$ (i = 1,..., m; j = l, ..., r), where *m* is the number of indicators to be compared, and *r* is the number of experts participating in the study. When calculating the variance-covariance, the experts' scores had to go through a ranking procedure (Eq. 1), and when calculating the weights, the results had to be rearranged again. The purpose of the rearrangement is to assign the weights in descending order of rank. In this way, the best rank (first) would be assigned the highest value. A linear transformation of the weights gives the most accurate result (Liao et al., 2024). In this case, the weights of the indicators can be calculated according to the following equation:

$$\omega_i = \frac{\sum_{j=1}^{r}(m+1-e_{ij})}{\sum_{i=1}^{m}\sum_{j=1}^{r}(m+1-e_{ij})}. \quad (8)$$

By rearranging the weights of both the task and evaluation dimension levels and adding the evaluation results, we obtain weights for the indicators and the tasks, with the highest weight reflecting the most influential indicator and vice versa.

In a further stage of the expert questionnaire, experts are asked to rate the extent to which each measure, without diversifying between specific objectives, generates social utility in the context of the defined aspects of the evaluation on a scale of 1 to 5, with one being the least contributing to the generation of social utility, and 5 being the most contributing to the generation of social utility (an example of how to assess the measure's objectives in Table 1).

Table 1. Sample starting matrix for expert assessments. *Compiled by author.*

Objectives of the measure	Evaluation scores		
	Expert *m*	Expert *n*	Expert *r*
1. To provide micro, small and medium-sized enterprises (hereinafter referred to as SMEs) with the necessary information, advisory, methodological and other support on export issues, the search for potential markets and international trade, thereby promoting export growth and the competitiveness of enterprises	4	...	$r_{1,j}$
2. Encourage the internationalisation of enterprises by providing support for the certification of products planned for export, which would help to create a positive image on international markets that Lithuanian enterprises provide quality products that meet international standards.	5	...	$r_{2,j}$
3. Encourage micro, small and medium-sized enterprises (SMEs) to focus as much as possible on finding new foreign markets and expanding existing markets.	3	...	$r_{3,j}$
...	...	...	...
Objective *i of* the measure	$r_{i,1}$	...	r_{ij}

It should be noted that the survey does not use the names of specific measures but rather the objectives of the measures, the activities supported, and the selection criteria for projects, extracted from the projects' financing documents and structured to simplify the experts' work and contribute to a more accurate survey result.

Once the weights have been determined, the chosen multi-criteria method can be applied, and the TOPSIS method has been selected in the concept to process the collected data. TOPSIS *(Technique for Order Preference by Similarity to an Ideal Solution) is a multi-criteria method* with deep theoretical and practical meaning (Kaklauskas et al., 2017; Wu et al., 2023). The main principle of this method is to select the one with the lowest distance from the best options and the highest distance from the worst options among the compared objects. The technique can be applied to maximising indicators (whose best values are maximal) and minimising indicators (whose best values are minimal), i.e. there is no need for a preliminary transformation of minimising indicators into maximising ones. Still, minimising indicators should be included in the concept. The TOPSIS approach is widespread and often used in practice. The TOPSIS method normalises and uses the distance between two points in the evaluation criteria. Due to the hierarchical evaluation system, the TOPSIS method must be applied at each hierarchical level, thus weighing the evaluation aspects of the measures and the tasks.

The TOPSIS method uses vector normalisation, namely as follows (Eq. 9):

$$\tilde{r}_{ij} = \frac{r_{ij}}{\sqrt{\sum_{j=1}^{n} r_{ij}^2}}. \qquad (9)$$

here r_{ij} - *the j-th* expert'*s* assessment of the *ith* alternative, (*i =1, ..., m; j =1,..., n*), $\tilde{r}_{ij}$ - the normalised value of the *TOPSIS* method *for the i-th* indicator for *the j-th* object.

The best solution (option) is then pre-selected V^*, i.*e.* find the maximum value of each indicator to be maximised (multiplied by the respective weights ω_i) and the minimum value of the minimising indicator. The following equation is used:

$$V^* = \{V_1^*, V_2^*, \dots, V_m^*\} = \{(max_j \omega_i \tilde{r}_{ij} \ / \ i \in I_1), (min_j \omega_i \tilde{r}_{ij} \ / \ i \in I_2)\} \qquad (10)$$

The worst solution (option) is also calculated V^-, namely as follows (Eq11):

$$V^- = \{V_1^-, V_2^-, \dots, V_m^-\} = \{(min_j \omega_i \tilde{r}_{ij} \ / \ i \in I_1), (max_j \omega_i \tilde{r}_{ij} \ / \ i \in I_2)\} \qquad (11)$$

Accordingly, I_1 - the set of indices to be maximised, I_2 - the set of indices for the indicators to be minimised, ω_i - the weight of *the i-th* indicator. The essence of the method, the distances to the best and to the worst solutions, i.e. the total distance for each of the comparators D_j^* to the best solutions (variants) V^* (Eq. 12) and the distance D_j^- to the worst solutions V^- (Eq. 13). The evaluation criteria (distances) include the significance (weight) of the relevant indicators $\omega_i$that affects the results. These values were calculated in the previous step. Equations 12&13 are following:

$$D_j^* = \sqrt{\sum_{i=1}^{m}(\omega_i \tilde{r}_{ij} - V_i^*)^2}. \quad (12)$$

$$D_j^- = \sqrt{\sum_{i=1}^{m}(\omega_i \tilde{r}_{ij} - V_i^-)^2}. \quad (13)$$

The main criterion for the *TOPSIS* method $C_j^*$is calculated as the ratio of the distance to the worst solution to the sum of the distances between the best and worst alternatives, with the best solution (variant) being the largest C_j^* value. The following equation is used:

$$C_j^* = \frac{D_j^-}{D_j^* + D_j^-}, (j = 1, \dots, n) \left(0 \leq C_j^* \leq 1\right). \quad (14)$$

Once the assessment at the lowest hierarchical level has been carried out, the procedure is repeated at a higher level until the result is obtained. The results of the method are interpreted in terms of the locations of the measures, i.e. the social utility generated by each measure, as calculated using the TOPSIS method. The assessment would identify the highest and lowest social utility-generating measures in the respective funding target and can be followed by a further analysis of the specificity of the measures to identify the core aspects that contribute to or, on the contrary, constrain the generation of social utility. This analysis could then be applied to other newly designed business measures or new calls for proposals to maximise the creation of social utility as a positive spill-over effect of business finance measures.

4. The results and discussion of the application of the applied methodology

To test the practical performance of the proposed concept of measuring the social utility of EU investment-financed business measures, an experimental setting is designed, consisting of accurate data on EU investment-financed business instruments and expert evaluations. To maintain a hierarchical structure and not to extend the experimental environment, the test is carried out on the instruments of two specific investment objectives (3.1.1 "Increase the level of entrepreneurship" and 3.3.2 "Increase SME investment in eco-innovation and other resource-efficient technologies" (Savickas, 2021).

In the context being considered, five experts have been specifically selected to provide their assessments. These assessments have been deliberately randomised to prevent any bias and maintain the integrity of the opinions. The preliminary evaluation has verified that the five experts were chosen based on predetermined competence and experience criteria. During the initial phase, these experts will assign ratings to assess the degree to which each task contributes to the creation of social utility, as well as the impact of each evaluation criterion on the generation of social utility at the tool level.

The calculated Kendall concordance coefficient (Eq. 6) showed that the opinions can be considered concordant, with a coefficient of 0.64 for the specific task and 0.48 for the measure evaluation criteria (Figure 2).

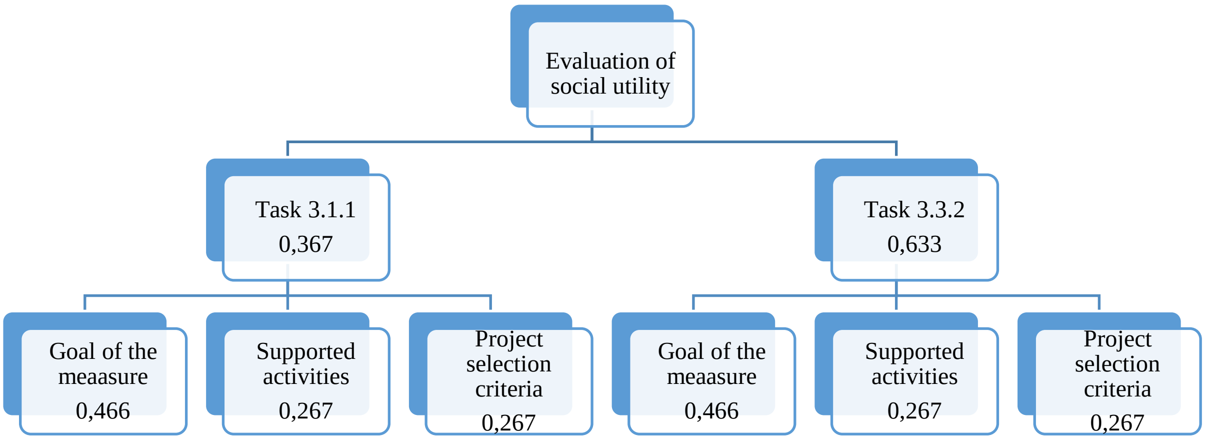

Figure 2. Weights resulted per tasks under consideration for social utility evaluation. *Compiled by author.*

The calculated aggregated weights (Eq. 8) of the targets and measures show that the measures under target 3.3.2, "Increase SME investment in eco-innovation and other resource-efficient technologies" (Savickas, 2021), are more relevant in social utility creation. In contrast, the measures under measure 3.3.2, "Increase SME investment in eco-innovation and other resource-efficient technologies"(Savickas, 2021), have the most significant influence on social utility creation in the measure level assessment due to the formulation of the measure's objective, the activities to be supported further, and the selection criteria for the selection of projects.

Once the weights have been determined, the data can be analysed using the TOPSIS method procedure described in section 3. Table 2 presents an initial starting table of the experts' assessments.

Table 2. The experts' assessments. *Compiled by author.*

Measure\Expert	**E1**	**E2**	**E3**	**E4**	**E5**
Business consultant LT. Objective of the measure	2	3	2	3	4
Business consultant LT. Supported activities	3	3	3	4	3
Business consultant LT. Project selection criteria	2	1	3	4	1
Entrepreneurship LT. Objective of the measure	1	3	2	1	2
Entrepreneurship LT. Supported activities	1	2	2	2	1
Entrepreneurship LT. Project selection criteria	3	4	3	3	3
Eco consultant LT. Objective of the measure	5	4	4	5	4
Eco consultant LT. Supported activities	4	5	4	5	5
Eco consultant LT. Project selection criteria	3	3	4	4	3
Eco-innovation LT. Objective of the measure	4	3	3	3	3
Eco-innovation LT. Supported activities	3	4	3	3	3
Eco-innovation LT. Project selection criteria	4	4	5	5	5
Eco-innovation LT+. Objective of the measure	3	4	3	3	2
Eco-innovation LT+. Supported activities	3	3	3	4	4
Eco-innovation LT+. Project selection criteria	3	3	3	2	4

After vector normalization (Eq. 9), the best and worst values of (Eq. 10 & 11) can be calculated from the Table 3.

Table 3. The best and worst values. *Compiled by author.*

Measure\Expert	E1	E2	E3	E4	E5
Business consultant LT. Objective of the measure	0,0064	0,0081	0,0059	0,0072	0,0110
Business consultant LT. Supported activities	0,0055	0,0046	0,0051	0,0055	0,0047
Business consultant LT. Project selection criteria	0,0037	0,0015	0,0051	0,0055	0,0016
Entrepreneurship LT. Objective of the measure	0,0032	0,0081	0,0059	0,0024	0,0055
Entrepreneurship LT. Supported activities	0,0018	0,0031	0,0034	0,0028	0,0016
Entrepreneurship LT. Project selection criteria	0,0055	0,0062	0,0051	0,0042	0,0047
Eco Consultant LT. Objective of the measure	0,0160	0,0108	0,0119	0,0121	0,0110
Eco Consultant LT. Supported activities	0,0073	0,0077	0,0068	0,0069	0,0079
Eco Consultant LT. Project selection criteria	0,0055	0,0046	0,0068	0,0055	0,0047
Eco-innovation LT. Objective of the measure	0,0128	0,0081	0,0089	0,0072	0,0083
Eco-innovation LT. Supported activities	0,0055	0,0062	0,0051	0,0042	0,0047
Eco-innovation LT. Project selection criteria	0,0073	0,0062	0,0085	0,0069	0,0079
Eco-innovation LT+. Objective of the measure	0,0096	0,0108	0,0089	0,0072	0,0055
Eco-innovation LT+. Supported activities	0,0055	0,0046	0,0051	0,0055	0,0063
Eco-innovation LT+. Project selection criteria	0,0055	0,0046	0,0051	0,0028	0,0063
V^*	**0,0160**	**0,0108**	**0,0119**	**0,0121**	**0,0110**
V^-	**0,0018**	**0,0015**	**0,0034**	**0,0024**	**0,0016**

With the best and worst values calculated, the distances to the best and worst values are then calculated (Eq. 12 & 13) for each benchmark expert solution. The results accordingly are presented in Table 4.

Table 4. Distances to the best and worst values. *Compiled by author.*

Indicator\ expert	E1	E2	E3	E4	E5
D*	0,0383	0,0197	0,0223	0,0262	0,0217
D-	0,0234	0,0210	0,0146	0,0158	0,0205

Once the distances have been calculated, the final TOPSIS method score can be calculated, i.e., which expert's solution is closest to the correct one (Eq. 14). The results are presented in Table 5.

Table 5. Final ranking. *Compiled by author.*

Indicator\ expert	E1	E2	E3	E4	E5
C*	0,3791	0,5155	0,3948	0,3759	0,4859
Rank	4	1	3	5	2

The E2 expert has identified the optimal solution, demonstrating the highest performance based on the specified criteria. This selection is justified, as the criteria emphasize corporate environmental education, thereby highlighting its pronounced social utility. However, given the experimental nature of this scenario aimed at testing the model's performance, the scientific validity of the results may necessitate further exploration and testing of heterogeneous tasks across various projects or investment programs within different economic sectors. Consequently, due consideration will need to be given to the externalities associated with each project and program per sector.

Conclusions

The scientific literature on social utility and methods of measuring the latter underscores the criticality of incorporating expert judgment when conducting social utility research using multi-criteria methods, irrespective of the specific subject matter. Previous research has indicated the importance of stratifying the system under assessment into hierarchical levels based on standard features to enhance the precision of expert evaluation. This approach is essential due to the numerous criteria for evaluating comparative measures within the relevant field.

In the initial conceptualisation phase, the EU investment Instruments are systematically categorised to align with the specific objectives of the Action Programme. Subsequently, each instrument undergoes a comprehensive evaluation against the principal criteria outlined in the FFCD. This process involves engaging experts to determine the materiality weights of the evaluation objects at each hierarchical level. These determinations are integral in assessing the consistency of perspectives and evaluating the scores obtained in the expert survey for the evaluation criteria of each measure. The data gathered through this process are then carefully analysed using the TOPSIS method to identify the expert who has proposed the most suitable solution. The combined scores of the selected expert can then be thoroughly examined at the level of the specific measure outlined in the evaluation results, allowing for a detailed understanding of the fundamental aspects contributing to the establishment of social utility through the measure. These identified aspects can be extrapolated to other business measures without biasing business interests, allowing for a positive impact of EU investments on the generation of social utility. As the result combined approach to assessing the social utility of EU-funded business measures was developed.

Consequently, the approach employed to assess the use of public funds in Lithuania can be extended to evaluate the social utility arising from both private and public investments across various economic sectors globally. Furthermore, the findings suggest that utilizing multiple multi-criteria approaches offers the most robust representation of the subject. Given the adaptability of the developed evaluation concept, additional research is recommended to evaluate the advantages and disadvantages of various methods and to determine the most appropriate combination of techniques. It is estimated that the synergistic use of these techniques will lead to more accurate results.

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ESI FONDŲ LĖŠOMIS FINANSUOJAMŲ VERSLO PRIEMONIŲ SOCIALINIO NAUDINGUMO VERTINIMAS

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Santrauka

2021–2030 m. Europos struktūrinių ir investicijų fondų panaudojimas Lietuvoje įgauna pagreitį, pabrėždamas šių fondų visapusiško panaudojimo būtinybę. Būtina užtikrinti, kad fondai palengvintų specializuotas sritis ir apimtų daugiakryptį finansavimą bei lengvatas valstybei, jos gyventojams ir įmonėms. Atsižvelgiant į tolesnės Lietuvos socialinio verslo sektoriaus pažangos poreikį, atsakomybė už viešųjų paslaugų teikimą tenka Lietuvos Respublikos Vyriausybei ir kitiems susijusiems subjektams. Lietuva turėtų pasinaudoti Europos Sąjungos investicijų teikiama galimybe skatinti socialinio naudingumo kūrimą ir teikimą. Tačiau mokslinėje literatūroje apie socialinį naudingumą ir pastarojo matavimo metodus pabrėžiama, kad kritiškai svarbu atsižvelgti į ekspertų nuomonę atliekant socialinio naudingumo tyrimus, naudojant daugiakriterinius metodus, nepriklausomai nuo konkretaus dalyko. Ankstesni tyrimai parodė, kad svarbu suskirstyti vertinamą sistemą į hierarchinius lygius, pagrįstus standartinėmis savybėmis, siekiant padidinti ekspertų vertinimo tikslumą. Šis požiūris yra labai svarbus dėl daugybės lyginamųjų priemonių vertinimo kriterijų atitinkamoje srityje.

Pradiniame konceptualizavimo etape ES investicinės priemonės sistemingai skirstomos į kategorijas, kad atitiktų konkrečius veiksmų programos tikslus. Vėliau kiekviena priemonė išsamiai vertinama pagal pagrindiniais pasirinktus kriterijus. Šis procesas apima ekspertų pasitelkimą, kad jie nustatytų vertinimo objektų reikšmingumo svorius kiekviename hierarchiniame lygmenyje. Šie nustatymai yra neatsiejami vertinant perspektyvų nuoseklumą ir vertinant ekspertų apklausoje gautus balus pagal kiekvienos priemonės vertinimo kriterijus. Šio proceso metu surinkti duomenys kruopščiai analizuojami taikant TOPSIS metodą, siekiant nustatyti tinkamiausią sprendimą pasiūliusį ekspertą. Atitinkamai bendri atrinkto eksperto balai gali būti nuodugniai išnagrinėti vertinimo rezultatuose nurodytos konkrečios priemonės lygmeniu, kad būtų galima išsamiai suprasti pagrindinius aspektus, prisidedančius prie socialinio naudingumo nustatymo. Šiuos nustatytus aspektus galima ekstrapoliuoti kitoms verslo priemonėms, sudarant sąlygas teigiamam ES investicijų poveikiui socialinio naudingumo kūrimui. Tokiame kontekste buvo sukurta bendra ES finansuojamų verslo priemonių socialinio naudingumo vertinimo sistema, paremta TOPSIS daugiakriterio metodo panaudojimu. Socialinio naudingumo vertinimo sistemos taikymo rezultatai patvirtina, kad socialinio naudingumo pažangos reikalavimus galima pasiekti nukreipiant investicijas į socialinį verslą ir kuriant viešąsias gėrybes. Šiuo požiūriu privačių operatorių, kurie yra pagrindiniai investicijų naudos gavėjai, pasitelkimas veiklai plėsti ir pelningumui didinti taip pat gali sukurti teigiamą socialinę naudą kaip pagalbinę priemonę be papildomų išlaidų ar suvaržymų. Atitinkamai tyrimo išvados atskleidžia galimybes taikyti TOPSIS metodą vertinant viešąsias ir privačiąsias investicijas į įvairiuose ūkio sektoriuose, taip pat ir tarptautiniame kontekste, bei naudojant kelis daugelio kriterijų metodus.

Sukurtos vertinimo koncepcijos pritaikomumo požiūriu rekomenduojama atlikti papildomus tyrimus, siekiant įvertinti įvairių metodų privalumus ir trūkumus bei nustatyti tinkamiausią metodų derinį.

Raktiniai žodžiai. Europos struktūriniai ir investicijų fondai (ESI fondai), socialinis naudingumas, verslo finansavimo priemonės, viešosios gėrybės, daugiakriteriniai metodai, ekspertų vertinimas.