sustainability

Article

Assessment of Green Banking Performance

Giedrė Lapinskienė * and Irena Danilevičienė

Faculty of Economics, VIKO Higher Education Institution, Saltoniškių 58, LT-08105 Vilnius, Lithuania; i.daniloviciene@ekf.viko.lt
* Correspondence: g.lapinskiene@ekf.viko.lt

Abstract: Internal and external pressures are pushing the financial system towards an increasingly environmentally responsible orientation. The damaging practices of green-washing necessitate the search for new ways of monitoring. The question then arises, how can one measure the actual degree of greenness of a banking industry? This study aims to create a new methodology framework to measure green performance in the banking industry using multi-criteria methods. We offer a theoretical contribution. First, a set of criteria was identified at the theoretical level. Second, the criteria were evaluated by practitioners and aggregated using the 'TOPSIS' method. This index may constitute a basis for ranking banks. The results showed that the most important factors to be considered when evaluating the performance of green banking are the greenness of the customers, the development of innovations leading to a green economy, the availability of green financial products and services, and the promotion of green education. These results lead to the conclusion that both banks and clients should become "greener" and utilize more green innovations and financial products/services.

Keywords: banking industry; green performance; multicriteria

check for updates

Citation: Lapinskienė, G.; Danilevičienė, I. Assessment of Green Banking Performance. *Sustainability* **2023**, *15*, 14769. https://doi.org/10.3390/su152014769

Academic Editor: Yong Tan

Received: 19 September 2023
Revised: 9 October 2023
Accepted: 10 October 2023
Published: 11 October 2023

1. Introduction

Nowadays, due to the consequences of climate change, the entire economy is in need of a core transformation, and the banking industry, using the concept of green finance, must be a leader of this transformation process. Green transformation is an approach to development that aims to move society toward sustainability in order to solve the problems brought about by climate change while simultaneously promoting digital transformation [1] and innovation acceleration [2,3]. It follows, then, that the main objective of green transformation is to achieve a balance between economic interests and nature [4]. The financial sector would therefore have to play a primary role in green transformation [5].

In modern times, banks are responsible for boosting green transformation; therefore, tracking green performance is very important. In addition to increasing society's environmental awareness, tighter regulation forces banks to take more serious actions regarding the green transformation of the economy, which it is obliged to do under increasingly stringent requirements [6]; these include Regulation 2021/2139 of the European Parliament and of the Council on the disclosure of sustainability-related information to the financial services sector, Taxonomy [7].

Considerably increased attention in the last decade has been paid to the banking industry and to their participation in transforming the economy to green. The industry's performance has been widely analysed from a financial perspective, but studies on green performance are still lacking. Environmental or ecological performance is defined as the impact of a company's operations on the natural environment [8]. The stream of academic articles related to green performance in the banking industry shows certain trends. The largest group of articles seeks answers regarding the ways in which the environmental consciousness of banking policies is validated by customers and helps to earn higher bank profits [5,8–11]. The analysis of sustainability or green performance in the banking industry is presented by highlighting some peculiarities of green products [12–14], reporting [15,16], the focus on climate change activities [17], and Environmental, Social and Governance (ESG) strategies [18]. A focus on green performance can open a new market for smaller banks, as their clients might be willing to assume the higher risks related to green transformation compared to large banks, whose larger customers might not find green transformation to be as valuable as their financial results [10].

The aim of this paper is to fill the gap in the literature by proposing a new framework for the development of an index regarding the environmental assessment of the banking sector, as this area is still in the development process [8–16]. The function of this index is to provide bankers, professionals, and policymakers with a tool for monitoring the level of green performance of banks, taking into account the green performance of banks as organizations and their participation in the green transformation of the economy.

The study starts with a review of the literature to identify relevant green performance criteria, which are separated into two categories: profit-motivated banking services and the internal resource management of banks. Then, the analysis of the expert database and the identification of the selection criteria was performed. The analysis of expert evaluation covers the following phases: matching the compatibility of expert evaluations, identifying the weights of the chosen criteria, and assessing their significance using the TOPSIS method (Technique for Order Preference by Similarity to Ideal Solution). The TOPSIS method is a renowned compromising method for multi-criteria decision analysis and is one of the most frequently used decision-making methods.

The paper is structured as follows. Sections 2 and 3 provide essential theoretical and methodological issues based on the concepts considered. Section 4 describes the main findings of the research. Sections 5 and 6 summarises the results, provides concluding remarks, and defines possible areas for further study.

2. Literature Review

The services of the banking industry are not considered to negatively impact the environment; they have the power to redirect investments to more environmentally friendly businesses and organizations. In the scientific and practitioners' literature, the performance of green banks is analysed from the organisation side of the banks and as a transformer for the green economy. Both parts are interrelated, with each part contributing to the overall task of environmental transformation. To tackle these issues, the banking industry, similar to many other industries, has adopted Corporate Social Responsibility (CSR) and sustainability strategies.

As regards the opportunity-based approach, the banking sector is applying CSR and sustainability strategies to improve its image, as such strategies address socially sensitive issues that appear to concern consumers and customers who want to contribute to a more humanitarian and socially responsible economy. Both strategies are also used to improve brand identity, as they give the impression that banks are sensitive to and responsible for their surroundings, and such an impression might positively impact customers who wish to contribute to a green economy. To reduce environmental and social risks, many banks have implemented ESG strategies. Most organisations and banking institutions have matched their ESG strategies to the United Nations' 17 Sustainable Development Goals (17 SDGs) [19]. Both in banking and in other industries, the methodologies used play an important role, helping to constantly improve activities according to the principles of sustainability. The most used methodologies are the Global Reporting Initiative, the United Nations Global Compact, and the Environmental, Social and Governance principles [20,21]. Banks have adopted several initiatives to maintain environmental sustainability: reducing paper consumption and printing; promoting teleworking and collaboration; waste management; developing and promoting digital banking channels such as online banking, mobile banking, and digital payment machines; installing solar-powered technologies; etc. Banking sector information technology strategies can help to significantly reduce transportation, financial, and environmental costs for consumers and banking institutions, thereby helping to maintain environmental sustainability. Several other banks have also undertaken important initiatives such as the financing of green energy projects and the adoption of green building practices, e.g., energy efficient lighting, censorship of mother fans, censorship of fan material, and duplex printing by major public broadcasters [22]. An important way to promote sustainable banking is to increase consumer acceptance of banking-related services performed via information technologies rather than via traditional branches [23].

In addition to the above, third parties have conducted various surveys and collected public information from various sources. Ratings and scores have been assigned based on company results according to the sustainability criteria defined by ESG (Bloomberg), Refinitiv Eikon, Thomson Reuters, Dow Jones sustainability, and others [24]. The S&P Global Sustainability Index Series includes a variety of indices that track the sustainability performance of companies in various sectors, including the S&P Global Banks Index, which covers banks and other financial institutions, and covers aspects such as climate transition, physical factors, natural capital, waste and pollution, and other factors of environmental risks [25].

The Refinitiv Eikon database proposes 34 variables related to the environmental aspect, grouped into three categories. The resource use efficiency category is measured by variables such as water and energy efficiency policies; environmental management systems; total energy and water consumption; usage rate of renewable energies; green buildings; and supply chain management and monitoring. The reducing emissions and waste category includes the following elements: emissions policies and targets; total carbon emissions; emissions to revenue; climate change opportunties; waste management; E-waste reduction; environmental restoration; reducing personnel transportation impacts; environmental spending; and income variables such as data regarding the financing of environmental projects, environmental products, environmental assets under management, equator principles, and clean energy products. The following discussion connects these indicators with the literature on environmental indicators, management, and performance in the banking sector [11].

The environmental performance of banks can be evaluated according to three factors: the efficient use of internal resources; the benefits resulting from investing into environmentally friendly projects; the reduction of risks associated with lending to environmentally risky industries. Banks are therefore directly involved in environmental activities, both within their organization and towards their customers and business partners. These measures can be summarized under the title ‘green production’, although banks are not industrial producers. Specific environmental initiatives can be divided into: (a) environmental business strategies such as concessional loans to innovative and environmentally friendly companies; (b) the selection of environmentally harmful projects in the credit evaluation process; (c) environmental philanthropy through donations to environmental causes; (d) voluntary emissions reductions such as reduced business travel; (e) environmental services through the use of electronic banking applications; (f) renewable energy for office buildings; and (g) the recycling of office waste [26,27].

The authors [15,28] evaluate the green activity of banks by distinguishing three groups of criteria: the development of green products, socially responsible initiatives, and green transformations in banking processes, assigning relevant indicators such as green credit cards, online banking, green savings accounts, or the training of employees on green initiatives. Toma and Stefanelli (2022) ranked Italian banks in terms of their green performance in terms of climate change policy, governance, risk assessment, and impact initiatives. The authors indicated that the position of each bank could vary, and that participation could depend on the size and geographic location of a given bank [17]. Gai et al. proposed a rating index that evaluates bank corporate governance decisions and internal behaviours related to environmental and social issues, as well as areas related to the stability of lending and investment activities [18]. The authors identified a list of relevant indicators for banks and their activities. Four dimensions were chosen: the field of environmental protection;

the social field; the management area; and the lending and investment areas related to ESG. The predecessor articles evaluated the ethical concepts of the banking industry and proposed the Social and Ethical Banking Index. This index, which defines the main aspects and their indicators, was constructed as follows: transparency; ethical and social assessment of investment projects from a triple-bottom-line perspective; inclusive and participatory governance; humane and sustainable structure; awareness-raising efforts [28]. The studies analysed show the main analysis directions: the environmental protection field; the social field; the management area, and the investment areas. The authors identified a list of relevant indicators for banks and their activities for each analysis direction.

In academic articles, the banks' performances were evaluated using various multicriteria methods for the financial field [29–33], for nonfinancial factors [34,35], and by those studies which considered both categories [36,37]. A few methods are appropriate for the analysis of these studies. TOPSIS, Hellwig, Delphi, and others could each be considered as appropriate, but the most appropriate of all for this phase of research is TOPSIS. The Hellwig method is not appropriate due to its low reliability and is not appropriate for the evaluation of banks. Other authors determined that the Hellwig method's correlation coefficient is smaller than that used using TOPSIS. The Delphi method is more structured and is appropriate for deep interviews with a number of experts larger than 50, which is not appropriate for the case of banks. The TOPSIS method has important advantages, including the following: (1) Explicit trade-offs and interactions between attributes are possible; (2) A preferential ranking of alternatives with a numerical value that provides a better understanding of the differences and similarities between alternatives can be provided; (3) Pairwise comparisons, which are required by methods such as the AHP, are available; (4) It is a relatively simple computational process with a systematic procedure; and (5) The TOPSIS method is more universal and can be used for the evaluation of banks. TOPSIS has been used in the banking sector, among other aspects, to evaluate financial results [38].

After reviewing the theoretical material, criteria for green outcomes in the banking sector were selected for expert evaluation. Ten criteria were selected in this phase: resource management (internal); waste management (internal); emissions management (internal); innovations leading to a green economy; internal management; external assessment; transparency; green financial products and services; education (green education); green customer review set.

3. Methodology and Data Collected

Expert evaluations represent one of the most widely developed scientific disciplines, the goals of which are the acquisition, systematic organization, structural processing, and interpretation of knowledge accumulated by a person over a long period of time using mathematical and logical methods. During the direct evaluation of the priority of objects, experts evaluate the factors according to a prespecified numerical scale, which is linked to the comparison—better/worse. For our methodology, we decided to make a concentrated questionnaire and submit closed targeted questions (defining the width of the ranking and evaluation scale). During the examination of the theoretical aspects presented in the questionnaire, measures and aspects that could promote harmony were highlighted. To avoid questions that could not be understood in the context of our research, which would therefore distort the research results, an appendix with guidelines for experts was provided along with the questionnaire. The experts were asked to compare their answers with each other according to their impact on green transformation. The experts ranked the measures and aspects presented on a scale of 1 to 10 (where 1—would have the least influence, 10—would have the most influence) (Table 1). In the second stage of the targeted part, experts evaluated each aspect and measure individually, according to their importance, thus contributing to coherence from 1 to 5 (where 1—the least important, 5—the most important).

Table 1. Alternatives to expert assessment (factors and measures).

X1	Management of Resources (internal)
X2	Waste Management
X3	Management of Emissions
X4	Innovations leading to green economy
X5	Internal Governance
X6	External assessment
X7	Transparency
X8	Green financial products and services
X9	Green education teaching
X10	Green Client Assessment

Source: Developed by the authors based on the analysis of scientific literature.

The research sample—the totality of participating experts—is determined in a probabilistic or non-probabilistic way. The essence of the probability sampling type is that it is statistically representative if the sample selected from the population is 50.01% or greater of the population, but this would be complicated by the number of respondents required to be interviewed for the study. The nonprobability basis of the selection type is a specific set of criteria formed by the researcher, according to which, suitable and unsuitable respondents are distinguished [10]. Although the research is based on the individual assessment of experts, we can call the selected respondents an expert group.

In this study, when determining the permissible number of experts, we were guided by the methodological assumptions of classical test theory, according to which, there is a rapidly decreasing non-linear relationship between the reliability of decisions made and the number of experts who make these decisionsc.

It has been shown that in expert assessment models, the accuracy of decisions and assessment of a large group of experts can be minimal, but the assessment accuracy of a group of three experts sometimes significantly exceeds the accuracy of an assessment of one or two experts. By further increasing the group of experts, the accuracy of the obtained estimates increases little by little and becomes the highest in a group of 5–9 experts [39,40]. Assuming the optimal number of experts with which the research becomes rational and reliable is 5–9 experts, 8 experts were selected for the research of this work. Based on expert selection methods and recommendations and combining them into a single set of criteria, we can say that the target working group should be assembled from eight respondents, considering their academic degree, positions held, and academic qualities, after assessing their experience working in banks and in scientific environments.

According to the set criteria (Table 2), suitable respondents (experts) were selected from various institutions and tasked with performing the following analysis:

- Determination of indicator weights
- Determining the compatibility of assessment
    - Determination of evaluations before the ranking procedure;
    - Evaluation after the ranking procedure;
    - Calculation of average ranks S and concordance coefficient W.
- Determination of weights
- Significance assessment using the TOPSIS method.
    - Expert evaluations of aspects and measures;
    - Weighted normalized values determination.
- Reorganization of indicators' weights and importance.

Table 2. Evaluation criteria of experts.

Selection Criteria	Response Evaluation
Does the respondent have an academic degree of at least a master's degree?	YES→suitable. NO→non-suitable.
Has the respondent worked for at least 5 years in institutions whose activities are related to banks or universities in the field of sustainability?	YES→suitable. NO→non-suitable.
Has the respondent worked for at least 5 years in institutions whose activities are focused on promoting sustainability?	YES→suitable. NO→non-suitable.
Has the respondent prepared presentations, given lectures, participated in expert research, seminars, trainings, or internships related to the promotion of sustainability for at least 5 years?	YES→suitable. NO→non-suitable.

Source: Compiled by the authors based on an analysis of the scientific literature.

4. Results

The assessment analysis of experts consists of steps: determining the compatibility of the assessments of the experts, determining the weights of the indicators, and assessing significance using the TOPSIS method. The analysis of the expert evaluations is followed by the summarization of all results and the presentation of conclusions.

4.1. Determination of Indicator Weights

The individual criteria that describe the influence of the research topic on the objective under consideration are not the same. Therefore, when using multi-criteria quantitative assessments, it is very important to consider the importance of the criteria, i.e., to determine their weight. Most currently known and used methods for determining the weights of multi-criteria evaluation criteria are based on expert assessments. The opinions of individual experts often do not coincide and may even be contradictory; therefore, weights as generalised averages of expert opinions can be used in a multicriteria assessment if the consistency of expert assessments is determined, i.e. if the opinions have been shown to be statistically aligned. Kendall's variance concordance coefficient can be used to determine the compatibility of assessments [41,42]. Beležentis and Žalimaitė as well as Bayanati also confirm that expert assessment is based on the assumption that a decision can only be made with consistent expert opinions [43,44]. After collecting all the data from the expert evaluation, it is necessary to assess the compatibility of the experts' opinions. If the number of experts is less than two, the correlation coefficient can be used to calculate the agreement of opinions (in this case, there are eight experts). If the number of experts is greater than two, the agreement coefficient gives the degree of expert group agreement.

Determining the Compatibility of Assessment

The set of expert evaluations is a matrix E = | | eij | | (i = 1,. . ., m; j = l,. . ., r). Here, m is the number of compared indicators, and r is the number of experts participating in the research. Each *j*-th expert evaluates each *i*-th indicator. Only the classification of expert indicators is suitable for the calculation of the dispersion concordance coefficient. If the experts evaluate the indicators in a different way, they should be preliminarily ranked, i.e., a ranking procedure should be carried out so that the most important indicator is given a rank equal to one, the second most important given a rank of two, etc. The last indicator in order of importance is rank m; where m is the number of compared indicators.

In the first part of the survey, experts had to determine the weight of the factors and measures presented according to their influence on sustainability, assigning a number from 1 to 10, respectively. The factor ranked 1 would have the least influence, while 10 would have the most influence (Table 3). In this case, the ranking procedure is necessary and is carried out for the corresponding assessment after assigning the opposite value (1).

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

where e_{ij} is the evaluation value after ranking, e_{max} is the maximum evaluation value (in this case 10), e_{ijS} is the initial evaluation value. After performing the ranking procedure, reordered values are obtained that meet the requirements for calculating the dispersion concordance coefficient (Table 4).

Table 3. Initial evaluations before the ranking procedure.

Expert Code, *j*	**Alternative Number, *i***									
	X_1	**X_2**	**X_3**	**X_4**	**X_5**	**X_6**	**X_7**	**X_8**	**X_9**	**X_{10}**
E1	8	2	7	6	5	10	1	3	9	4
E2	7	8	5	6	1	10	2	3	4	9
E3	9	4	5	10	2	7	1	3	8	6
E4	6	1	5	10	4	7	3	2	8	9
E5	2	1	3	5	6	8	4	9	7	10
E6	4	1	5	7	8	2	6	10	3	9
E7	4	1	5	8	9	3	6	10	2	7
E8	8	9	10	6	7	3	4	5	2	1

Sources: Developed by the authors based on questionnaire data.

Table 4. Evaluations after completing the rank.

Expert Code, *j*	**Alternative Number, *i***									
	X_1	**X_2**	**X_3**	**X_4**	**X_5**	**X_6**	**X_7**	**X_8**	**X_9**	**X_{10}**
E1	3	9	4	5	6	1	10	8	2	7
E2	4	3	6	5	10	1	9	8	7	2
E3	2	7	6	1	9	4	10	8	3	5
E4	5	10	6	1	7	4	8	9	3	2
E5	9	10	8	6	5	3	7	2	4	1
E6	7	10	6	4	3	9	5	1	8	2
E7	7	10	6	3	2	8	5	1	9	4
E8	3	2	1	5	4	8	7	6	9	10

Source: Developed by the authors based on questionnaire data and calculations.

After the ranking procedure, the variance concordance coefficient defined by M. Kendall can be calculated. The basis of the calculation is the sum of the ranks e_i of each i, the indicator, in relation to all experts (2). In other words, the sum of the squares of the values e_i in deviation from the average rank $\bar{e}$ (4) S (analogy of variance) (3).

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

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

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

Theoretically, it is possible for all experts' assessments to be absolutely identical, in which case, the experts' opinions could be considered maximally harmonized S_{max} (5). Such a case would be considered ideal regarding the compatibility of expert opinions. If none of the evaluations matched, the value of S would be zero. If S is the real sum of squares, calculated according to Formula (3), then the concordance coefficient W, when there are no associated ranks, is defined by the ratio of the sum of squares of the average rank S and the maximally agreed opinion of experts' assessments S_{max} (6).

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

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

If the experts' opinions agree, the value of the concordance coefficient W approaches unity W 1. If the evaluations differ, the value of W approaches zero W 0.

When adapting to a specific research case, the compatibility of the experts' assessments was determined, i.e., the concordance coefficient (Table 5). It is estimated that the sum of all ranks $\sum_{i=1}^{r} e_i = 440$, the average of ranks $\bar{e} = \frac{440}{10} = 44$, the sum of squares of the deviation from the mean rank $S = 954$, and the sum of the maximum squares of deviation $S_{max} = \frac{8^2 10(10^2-1)}{12} = 5280$; thus, the concordance coefficient $W = 0.18$.

Table 5. Calculation of dispersion concordance coefficient.

Alternative Number, *i*	**X_1**	**X_2**	**X_3**	**X_4**	**X_5**	**X_6**	**X_7**	**X_8**	**X_9**	**X_{10}**	
The sum of ranks, e_i	40	61	43	30	46	38	61	43	45	33	440
Deviation from mean rank $(e_i - \bar{e})$ And average rank, $\bar{e}$	−4	17	−1	−14	2	−6	17	−1	1	−11	44
Squares of the deviation from the mean rank $(e_i - \bar{e})^2$ and their sum, S	16	289	1	196	4	36	289	1	1	121	954
Maximum matched estimates, S_{max}						5280					
Concordance coefficient, W						0.18					

Source: Compiled by the authors based on calculations.

Based solely on this concordance coefficient, it would be difficult to prove whether the opinions of the experts are aligned, since the number of indicators considered is more than seven; therefore, an evaluation of the importance of the concordance coefficient is recommended. M. Kendall proved that if the number of indicators $m > 7$, the significance of the concordance coefficient can be determined using the χ^2 Pearson criterion. The random variable (7) is distributed according to the χ^2 distribution with $\nu = m - 1$ degrees of freedom. According to the chosen significance level α (in practice, 0.05 or 0.01 is usually used), the critical value is found in the distribution table with $\nu = m - 1$ degree of freedom. If the value of χ^2 calculated in (7) is greater than the critical value of χ^2_{kr}, it is considered that the experts' assessments are in agreement. However, attention is drawn to the fact that when the number of indicators compared by m is from three to seven, the χ^2 distribution should be applied with caution, because the critical χ^2_{kr}. The value of the distribution may be higher than the calculated value, although the level of agreement of the experts' opinions is still sufficient. In such a case, it is possible to apply probabilistic tables of the concordance coefficient (with $3 \leq m \leq 7$) or S tables of critical values [41].

$$\chi^2 = Wr(m-1) = \frac{12rS(m-1)}{r^2 m(m^2 - 1)} = \frac{12S}{rm(m+1)}. \tag{7}$$

In a specific case, $\chi^2 = \frac{12*44}{8*10(10+1)} = 29{,}697$ $\chi^2 = \frac{12*44}{8*10(10+1)} = 29{,}697$, the calculated degree of freedom ν = 10 – 1 = 11, the significance level α = 0.05 is chosen, then the critical χ^2_{kr}. The value from the difference table is $\chi^2_{kr} = 16.92$. After comparing the obtained results, we see that $\chi^2 > \chi^2_{kr}$, which means that the experts' opinions are considered statistically aligned, so it is possible to calculate the weight of each indicator.

4.2. Determination of Weights

As in the calculation of the consensus of opinions, we will denote the results of the expert evaluation by e_{ij} and place the matrix E = | | eij | | (i = 1,. . ., m; j = l,. . ., r), where m is the number of indicators compared and r is the number of experts participating in the study. When calculating the dispersion coefficient of concordance, we had to perform a ranking procedure (1) for expert evaluations while calculating the weights. Here, it is necessary to rearrange the results again. The goal of reordering is to assign weights in descending order. This way, the highest (first) position gets the highest value. The most accurate result is provided by a linear transformation of the estimates [41,42]. In this case, the criteria weight values can be calculated according to Equation (8).

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

After rearranging and calculating the results of the evaluations, we obtained the weights of the indicators, of which the highest of the weights reflects the most influential indicator and vice versa.

As can be seen in Table 6, innovations leading to a green economy have the greatest weight in the process of green banking performance $(X_4 = 0.1318)$. An additional important aspect is $(X_{10} = 0.1250)$, the green client's assessment. All other aspects and measures follow.

Table 6. Reorganised indicator weights.

Indicator Number	**X_1**	**X_2**	**X_3**	**X_4**	**X_5**	**X_6**	**X_7**	**X_8**	**X_9**	**X_{10}**
Rearranged indicator weights, ω_i	0.1091	0.0614	0.1023	**0.1318**	0.0955	0.1136	0.0614	0.1023	0.0977	**0.1250**

Source: Developed by the authors based on calculations.

4.3. Significance Assessment Using the TOPSIS Method

In the first stage of the targeted part, the experts evaluated aspects and measures by ranking them and comparing them with each other. In the second stage, the experts were asked to rate each aspect or measure separately, according to their importance, as related to the promotion of sustainability, from 1 to 5, where 1 is the least important and 5 is the most important (Table 7). We used the TOPSIS (Technique for Order Preference by Similarity to an Ideal Solution) method to process the collected data. The TOPSIS method is a multi-criteria method with profound theoretical and practical significance.

Table 7. Expert evaluations of individual aspects and measures.

Expert Code, *j*	**Alternative Number, *i***									
	X_1	**X_2**	**X_3**	**X_4**	**X_5**	**X_6**	**X_7**	**X_8**	**X_9**	**X_{10}**
E1	5	3	4	4	2	5	1	3	4	3
E2	5	4	5	5	1	5	1	2	5	5
E3	5	3	4	5	3	5	3	3	5	4
E4	4	4	4	5	3	4	3	4	5	5
E5	2	2	4	5	5	5	5	5	5	5
E6	3	3	4	4	5	3	5	5	4	5
E7	3	3	3	4	5	2	5	5	4	4
E8	5	5	5	4	5	3	3	4	3	2

Source: Developed by authors based on survey data.

The main principle of this method is to select, from the compared objects, the object with the smallest distance from the best options and the largest distance from the worst options. The method can be applied to both maximising indicators (whose best values are the largest) and minimising indicators (whose best values are minimum), i.e., there is no need to preliminarily transform minimisation indicators into maximisation ones. The TOPSIS method is popular and often used in practice. The normalisation of the TOPSIS method and the evaluation criteria use the distance between two points.

The TOPSIS method uses vector data normalisation (9).

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

Here, r_{ij} is the evaluation of the *j*-th expert for the *i*-th alternative, (i = 1,. . ., m; j = 1,. . ., n), $\tilde{r}_{ij}$ is the normalized value of the *i*-th indicator of the *j*-th object as determined by the TOPSIS method. Next, the best solution (variant) V^* (10) is preliminarily selected, i.e., we find the maximum value of each maximisation indicator (multiplied by the corresponding weights ω_i) and the minimum value of the minimisation indicator. The worst solution (variant) V^- (11) is also calculated.

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

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

Consequently, I_1 is the set of indices for the maximised indicators, I_2 is the set of indices for the minimised indicators, and ω_i is the weight of the *i*-th indicator. The essence of the method, the distances to the best and the worst solutions, i.e., the total distance D_j^* of each compared variant to the best solutions (variants) V^* (12) and the distance D_j^- to the worst solutions V^- (13). The evaluation criteria (distances) include the significance (weight) value ω_i of the relevant indicators, which affects the results.

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

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

The main criterion of the TOPSIS method C_j^* is calculated as the ratio of the distance to the worst solutions and the sum of the distances between the best and worst solutions (14), and the best solution (variant) corresponds to the highest value C_j^*.

$$C_j^* = \frac{D_j^-}{D_j^* + D_j^-}, \ (j = 1, \ldots, n) \ \left(0 \le C_j^* \le 1\right). \tag{14}$$

Normalised data values are calculated (Table 8).

Table 8. Normalised r_{ij} values of calculation criteria $\widetilde{r}_{ij}$.

Expert code, *j* \ Weight, ω_i	Alternative Number, *i*									
	X_1	**X_2**	**X_3**	**X_4**	**X_5**	**X_6**	**X_7**	**X_8**	**X_9**	**X_{10}**
	0.1091	0.0614	0.1023	0.1318	0.0955	0.1136	0.0614	0.1023	0.0977	0.1250
E1	0.137	0.082	0.110	0.110	0.055	0.137	0.027	0.082	0.110	0.082
E2	0.137	0.110	0.137	0.137	0.027	0.137	0.027	0.055	0.137	0.137
E3	0.137	0.082	0.110	0.137	0.082	0.137	0.082	0.082	0.137	0.110
E4	0.110	0.110	0.110	0.137	0.082	0.110	0.082	0.110	0.137	0.137
E5	0.055	0.055	0.110	0.137	0.137	0.137	0.137	0.137	0.137	0.137
E6	0.082	0.082	0.110	0.110	0.137	0.082	0.137	0.137	0.110	0.137
E7	0.082	0.082	0.082	0.110	0.137	0.055	0.137	0.137	0.110	0.110
E8	0.137	0.137	0.137	0.110	0.137	0.082	0.082	0.110	0.082	0.055

Source: Developed by authors based on survey data and calculations.

Next, it is necessary to calculate the weighted normalised values, because the TOPSIS method does not use normalized $\widetilde{r}_{ij}$ values, but rather uses weighted $\omega_i\widetilde{r}_{ij}$ values (Table 9).

Table 9. Weighted normalized values $\omega_i\widetilde{r}_{ij}$.

Expert Code, *j*	Alternative Number, *i*									
	X_1	**X_2**	**X_3**	**X_4**	**X_5**	**X_6**	**X_7**	**X_8**	**X_9**	**X_{10}**
E1	0.0149	0.0050	0.0112	0.0144	0.0052	0.0156	0.0017	0.0084	0.0107	0.0103
E2	0.0149	0.0067	0.0140	0.0180	0.0026	0.0156	0.0017	0.0056	0.0134	0.0171
E3	0.0149	0.0050	0.0112	0.0180	0.0078	0.0156	0.0050	0.0084	0.0134	0.0137
E4	0.0119	0.0067	0.0112	0.0180	0.0078	0.0124	0.0050	0.0112	0.0134	0.0171
E5	0.0060	0.0034	0.0112	0.0180	0.0131	0.0156	0.0084	0.0140	0.0134	0.0171
E6	0.0090	0.0050	0.0112	0.0144	0.0131	0.0093	0.0084	0.0140	0.0107	0.0171
E7	0.0090	0.0050	0.0084	0.0144	0.0131	0.0062	0.0084	0.0140	0.0107	0.0137
E8	0.0149	0.0084	0.0140	0.0144	0.0131	0.0093	0.0050	0.0112	0.0080	0.0068

Source: Developed by authors based on survey data and calculations.

With the weighted normalised values, it is possible to select the values of the best solutions (variants) V^* and the values of the worst solutions (variants) V^- (Table 10).

Table 10. Values of the best V^* and worst V^- variants.

Solutions (Options)	Alternative Number, *i*									
	X_1	**X_2**	**X_3**	**X_4**	**X_5**	**X_6**	**X_7**	**X_8**	**X_9**	**X_{10}**
V^*	0.015	0.008	0.014	0.018	0.013	0.016	0.008	0.014	0.013	0.017
V^-	0.006	0.003	0.008	0.014	0.003	0.006	0.002	0.006	0.008	0.007

Source: Developed by authors based on calculations.

After selecting the best and worst variants, the values of the partial criteria (distances) of the TOPSIS methods are calculated, that is, the distances to the best solutions D_j^* (12) and to the worst solutions D_j^- (13) (Table 11).

Table 11. Distances of individual experts' assessments to solutions D_j^* and D_j^-.

Solutions (Options)	**Expert Code**							
	E1	**E2**	**E3**	**E4**	**E5**	**E6**	**E7**	**E8**
D_j^*	0.0218	0.0219	0.0187	0.0177	0.0190	0.0180	0.0189	0.0204
D_j^-	0.0146	0.0190	0.0178	0.0177	0.0218	0.0193	0.0172	0.0174

Source: Developed by authors based on calculations.

Based on the data in Table 11, the values of C_j^* (14), the main criterion for evaluating the alternatives of the TOPSIS method, are calculated (Table 12).

Table 12. Values of the TOPSIS method criterion C_j^* and positions occupied by expert evaluations.

Criterion	**Expert Code**							
	E1	**E2**	**E3**	**E4**	**E5**	**E6**	**E7**	**E8**
C_j^*	0.4016	0.4646	0.4878	0.5003	0.5338	0.5179	0.4760	0.4608
Place	8	6	4	3	1	2	5	7

Source: Developed by authors based on calculations.

As can be seen in Table 12, the best solution of aspects and measures according to the TOPSIS method, by evaluating the weights of each measure, was accepted by expert E5, followed by experts E6 and E4. The evaluations of the selected experts are presented in Table 13.

Table 13. Evaluations of experts who took the highest places using the TOPSIS method.

Expert Code, *j*	**Alternative Number, *i***									
	X_1	X_2	X_3	X_4	X_5	X_6	X_7	X_8	X_9	X_{10}
E5	2	2	4	5	5	5	5	5	5	5
E6	3	3	4	4	5	3	5	5	4	5
E4	4	4	4	5	3	4	3	4	5	5

Source: Developed by authors based on survey data.

After analysing the data collected from experts on the importance of each factor using the TOPSIS method, all data were normalised according to vector data normalisation, then, all assessments were weighted, including previously calculated factor weights. Since the main principle of the TOPSIS method is to select, from the compared objects, the object with the smallest distance from the best options and the largest distance from the worst options, the values of the best V^* and worst V^- options and the distances of individual experts' assessments to the solutions D_j^* and D_j^- were calculated. After evaluating these indicators, the values of the TOPSIS method criterion C_j^* and the places occupied by experts' evaluations were calculated. Here, we can also find the weights of each indicator (Table 14).

Table 14. Reorganised indicator weights and importance.

Indicator Number	X_1	X_2	X_3	X_4	X_5	X_6	X_7	X_8	X_9	X_{10}
Indicator weights, ω_i	0.072	0.072	0.096	0.112	0.104	0.096	0.104	0.112	0.112	0.12
Place	9–10	9–10	7–8	2–4	5–6	7–8	5–6	2–4	2–4	1

Source: Developed by the authors based on calculations.

It was found that the main factor of the aspects and measures according to this method is X10 (green client's assessment). It follows that banks should evaluate the green level of their clients. Other main factors are the following: X4, (innovations leading to a green economy), X8 (development of green financial products and services), X9 (green education/teaching).

5. Discussion

Rising concerns regarding rapid environmental degradation have brought increasing attention to the green concept at political, academic, and practical levels. The financial system has a mandate to lead the transformation to a green economy, and the banking sector should be at the forefront of this effort. Consequently, we suggest that the green performance of banks should be measured, as such monitoring will foster ecological well-being. The assessment of greenness often falls under the concept of ESG, where, in many cases, the social dimension is analysed more deeply [45].

Our results are in line with those who also highlight measures to create positive environmental effects, such as green innovations and practises, resource management, and emissions management, to evaluate the environmental measures of borrowers [23,46]. Our results support other findings of the articles referenced, as well as economic logic. The green criteria highly ranked by us in the 'client assessment' section are in line with the discussions regarding the implementation of credit ratings based on sustainable dimensions in the articles written by [46].

Our chosen method, TOPSIS, is widely used in similar studies [47–50]. The TOPSIS method is applied to each decision maker's weighted matrix of performances, resulting in a vector of alternatives with a ranking value. The vectors of all decision makers are then combined to generate a group matrix of performances. Determining the weight value calculated by the normalised matrix value requires a relatively better technique to obtain optimal results. Thus, the SMARTER method (Simple Multi-Attribute Rating Technique Exploiting Ranks) is used in the helpful weighting stage to obtain the optimal value. The SMARTER method can optimise the weighting value before proceeding to the next stage. This method is based on the theory that each alternative has several criteria with varying importance values and weights. The weighting in the SMARTER method uses a range between 0 and 1, thus facilitating the calculation and comparison of the values in each alternative.

The study was subject to several limitations.

1. Several methods of expert evaluation can be used to evaluate expert opinion, and similar results would likely be obtained, but the TOPSIS method is used for analysis, which is one of the simplest and most reliable methods used to evaluate expert opinion. It is possible that using a different method for analysis could cause the obtained results to be different, but here, the TOPSIS method was determined to be the most appropriate evaluation method. Using such a method, we follow the authors in assessing the performance of banks using TOPSIS methods [47–50].

2. The greater the number of experts interviewed, the more reliable the results are likely to be. In the article, eight experts are selected for the analysis because, based on the results of the literature analysis, this is the optimal number of experts needed to obtain reliable results. It is necessary to mention that the participating experts are persons that have worked in the banking sector for many years, and in everyday activity, their work is closely related to the fostering of sustainability.

3. Different factors/alternatives can be applied when analysing banking activities. Here, 10 groups of indicators were selected which best reflect the analysis topic.

The results of our study can provide useful information for regulators and managers to transform processes and expand knowledge about green performance in banking processes, as well as to avoid ecological simulation (green-washing). For future studies, the full methodology for formulating the index can be developed by evaluating various indicators according to the chosen criteria, following [51–53].

6. Conclusions

The assessment of the green performance of business units is carried out according to the strategy, the adjustment of goals, the definition and monitoring of sustainability indicators, and the submission of reports. In addition to traditional green transition activities, the banking sector plays a broader role by financing and investing in renewable energy and energy efficiency projects, offering environmentally friendly products and services, and working with stakeholders to promote the transition to a more sustainable green economy. The banking sector has played an important role in promoting the green development goals of the economy, both as an organization (e.g., by implementing various improvements) and by fulfilling its environmental responsibilities by integrating green lending practices into its decisions.

Based on a content analysis, we systemized a set of criteria that have been chosen for further evaluation by eight experts: management of resources (internal); waste management (internal); management of emissions (internal); innovations leading to a green economy; internal governance; external assessment; transparency; green financial products and services; green education/teaching; assessment of the greenness of clients.

Based on the results of the expert questionnaires, the concordance coefficient W = 0.18 was calculated, but based only on this concordance coefficient, it would be difficult to prove whether the opinions of the experts are aligned, since the number of indicators considered is more than seven, so the significance of the concordance coefficient was evaluated according to the χ2 Pearson criterion. If the significance level $\alpha = 0.05$ and the degree of freedom $\nu = 10 - 1 = 11$, the calculated critical value $\chi^2_{kr} = 16.92$, Pearson's criterion $\chi^2 = 29{,}697$, since the latter is greater than the critical value, is accepted, showing that experts' opinions are statically aligned. The authors argue that the TOPSIS method is very universal, and the results are clear and reliable. Based on Table 14, we can say that the most important is the 10th indicator, because all experts say that the weight of this indicator is the best. The highest significance was found to demonstrate the assessment of the green client. This result supports the economic logic of the green finance concept, and it follows that banks should evaluate the green level of their clients. In the case of other indicators, weights are very similar, and it is impossible to distinguish the three most important factors with greater weight. Other main factors are the innovations leading to a green economy, the development of green financial products and services, as well as green education/teaching.

Author Contributions: Conceptualization, G.L.; Methodology, I.D.; Formal analysis, I.D.; Writing—original draft, G.L. and I.D.; Supervision, G.L. All authors have read and agreed to the published version of the manuscript.

Funding: This research received no external funding.

Institutional Review Board Statement: Not applicable.

Informed Consent Statement: Informed consent was obtained from all subjects involved in the study.

Data Availability Statement: Not applicable.

Conflicts of Interest: The authors declare no conflict of interest.

References

1. Fukui, H.; Man, D.C.; Phan, A. Digital Earth: A platform for the SDGs and green transformation at the global and local level, employing essential SDGs variables. *Big Earth Data* **2021**, *5*, 476–496. [CrossRef]
2. Hu, G.; Wang, X.; Wang, Y. Can the green credit policy stimulate green innovation in heavily polluting enterprises? Evidence from a quasi-natural experiment in China. *Energy Econ.* **2021**, *98*, 105134. [CrossRef]
3. Zhou, G.; Zhu, J.; Luo, S. The impact of fintech innovation on green growth in China: Mediating effect of green finance. *Ecol. Econ.* **2022**, *193*, 107308. [CrossRef]
4. Wang, K.H.; Zhao, Y.X.; Jiang, C.F.; Li, Z.Z. Does green finance inspire sustainable development? Evidence from a global perspective. *Econ. Anal. Policy* **2022**, *75*, 412–426. [CrossRef]
5. Liu, N.; Liu, C.; Xia, Y.; Ren, Y.; Liang, J. Examining the Coordination Between Green Finance and Green Economy Aiming for Sustainable Development: A Case Study of China. *Sustainability* **2020**, *12*, 3717. [CrossRef]

6. European Parliament. Commission Delegated Regulation (EU) 2021/2178. Available online: https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A32021R2178 (accessed on 17 January 2023).
7. European Parliament. Commission Delegated Regulation (EU) 2021/2139. Available online: https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=celex%3A32021R2139 (accessed on 20 March 2023).
8. Aslam, W.; Jawaid, S.T. Green banking adoption practices: Improving environmental, financial, and operational performance. *Int. J. Ethics Syst.* **2022**. [CrossRef]
9. Lapinskienė, G.; Gedvilaitė, D.; Liučvaitienė, A.; Peleckis, K. How Does Environmental Data from ESG Concept Affect Stock Returns: Case of the European Union and US Capital Markets. *Emerg. Sci. J.* **2023**, *7*, 410–427. [CrossRef]
10. Chen, J.; Siddik, A.B.; Zheng, G.W.; Masukujjaman, M.; Bekhzod, S. The Effect of Green Banking Practices on Banks' Environmental Performance and Green Financing: An Empirical Study. *Energies* **2022**, *15*, 1292. [CrossRef]
11. Bătae, O.M.; Dan Dragomir, V.; Feleagă, L. The relationship between environmental, social, and financial performance in the banking sector. A European study. *J. Clean. Prod.* **2021**, *290*, 125791. [CrossRef]
12. Lapinskienė, G.; Mečėjienė, G.; Steiblienė, L. Green Finance: Case of Lithuania. *Moksl. Taikom. Tyrim. Liet. Kolegijose* **2022**, *2*, 131–138.
13. Bedendo, M.; Nocera, G.; Siming, L. Greening the Financial Sector: Evidence from Bank Green Bonds. *J. Bus. Ethics* **2022**, 1–21. [CrossRef]
14. Mirovic, V.; Kalas, B.; Djokic, I.; Milicevic, N.; Djokic, N.; Djakovic, M. Green Loans in Bank Portfolio: Financial and Marketing Implications. *Sustainability* **2023**, *15*, 5914. [CrossRef]
15. Kumar, K.; Prakash, A. Examination of sustainability reporting practices in Indian banking sector. *Asian J. Sustain. Soc. Responsib.* **2019**, *4*, 2. [CrossRef]
16. Gunawan, J.; Permatasari, P.; Sharma, U. Exploring sustainability and green banking disclosures: A study of banking sector. *Environ. Dev. Sustain.* **2022**, *24*, 11153–11194. [CrossRef]
17. Toma, P.; Stefanelli, V. What are the banks doing in managing climate risk? Empirical evidence from a position map. *Ecol. Econ.* **2022**, *200*, 107530. [CrossRef]
18. Gai, L.; Bellucci, M.; Biggeri, M.; Ferrone, L.; Ielasi, F. Banks' ESG disclosure: A new scoring model. *Financ. Res. Lett.* **2023**, *57*, 104199. [CrossRef]
19. Stauropoulou, A.; Sardianou, E.; Malindretos, G.; Evangelinos, K.; Nikolaou, I. The effects of economic, environmentally, and socially related SDGs strategies of banking institutions on their customers' behaviour. *World Dev. Sustain.* **2023**, *2*, 100051. [CrossRef]
20. Narula, S.; Puppala, H.; Kumar, A.; Frederico, G.F.; Dwivedy, M.; Prakash, S.; Talwar, V. Applicability of industry 4.0 technologies in the adoption of global reporting initiative standards for achieving sustainability. *J. Clean. Prod.* **2021**, *305*, 127141. [CrossRef]
21. Podrecca, M.; Sartor, M.; Nassimbeni, G. United Nations Global Compact: Where are we going? *Soc. Responsib. J.* **2022**, *18*, 984–1003. [CrossRef]
22. Taneja, S.; Liaqat, A. Determinants of customers' intentions towards environmentally sustainable banking: Testing the structural model. *J. Retail. Consum. Serv.* **2021**, *59*, 102418. [CrossRef]
23. Burhanudin, B.; Ronny, R.; Sihotang, E.T. Connecting intention to use online banking, commitment to environmental sustainability, and happiness: The role of nature relatedness. *Procedia Comput.* **2019**, *161*, 341–349. [CrossRef]
24. Papoutsi, A.; Sodhi, M.S. Does disclosure in sustainability reports indicate actual sustainability performance? *J. Clean. Prod.* **2020**, *260*, 121049. [CrossRef]
25. S&P Global. 2023. Available online: https://www.spglobal.com/marketintelligence/en/campaigns/sustainability-for-banks (accessed on 1 May 2023).
26. Gangi, F.; Meles, A.; D'Angelo, E.; Daniele, L.M. Sustainable development, and corporate governance in the financial system: Are environmentally friendly banks less risky? *Corp. Soc. Responsib. Environ. Manag.* **2019**, *26*, 529–547. [CrossRef]
27. Laguir, I.; Marais, M.; El Baz, J.; Stekelorum, R. Reversing the business rationale for environmental commitment in banking: Does financial performance lead to higher environmental performance? *Manag. Decis.* **2018**, *56*, 358–375. [CrossRef]
28. Sharma, M.; Choubey, A. Green banking initiatives: A qualitative study on Indian banking sector. *Environ. Dev. Sustain.* **2022**, *24*, 293–319. [CrossRef] [PubMed]
29. Tsagkarakis, M.P.; Doumpos, M.; Pasiouras, F. Capital shortfall: A multicriteria decision support system for the identification of weak banks. *Decis. Support Syst.* **2021**, *145*, 113526. [CrossRef]
30. Gaganis, C.; Papadimitri, P.; Tasiou, M. A multicriteria decision support tool for modelling bank credit ratings. *Ann. Oper. Res.* **2021**, *306*, 27–56. [CrossRef]
31. Kosmidou, K.; Pasiouras, F.; Doumpos, M.; Zopoundis, C. Assessing Performance Factors in the UK Banking Sector: A Multicriteria Methodology. *Cent. Eur. J. Oper. Res.* **2006**, *14*, 25–44. [CrossRef]
32. Doumpos, M.; Zopounidis, C.; Fragiadakis, P. Assessing the financial performance of European banks under stress testing scenarios: A multicriteria approach. *Oper. Res.* **2016**, *16*, 197–209. [CrossRef]
33. García, F.; Guijarro, F.; Moya, I. Ranking Spanish savings banks: A multicriteria approach. *Math. Comput. Model.* **2010**, *52*, 1058–1065. [CrossRef]

34. Aguado-Correa, F.; de la Vega-Jiménez, J.; López-Jiménez, J.M.; Padilla-Garrido, N.; Rabadán-Martín, I. Evaluation of non-financial information and its contribution to advancing the sustainable development goals within the Spanish banking sector. *Eur. Res. Manag. Bus. Econ.* **2023**, *29*, 100211. [CrossRef]
35. Cosma, S.; Venturelli, A.; Schwizer, P.; Boscia, V. Sustainable Development and European Banks: A Non-Financial Disclosure Analysis. *Sustainability* **2020**, *12*, 6146–6164. [CrossRef]
36. Ishizaka, A.; Lokman, B.; Tasiou, M. A Stochastic Multi-criteria divisive hierarchical clustering algorithm. *Omega* **2021**, *103*, 102370. [CrossRef]
37. Reig-Mullor, J.; Brotons-Martinez, J.M. The evaluation performance for commercial banks by intuitionistic fuzzy numbers: The case of Spain. *Soft. Comput.* **2021**, *25*, 9061–9075. [CrossRef]
38. Oral, C. Evaluating the financial performances of privately owned deposit banks in Turkey by Topsis method. *J. Bus. Res. Turk* **2016**, *8*, 448–455. [CrossRef]
39. Libby, R.; Blashfield, R. Performance of a composite as a function of a number of judges. *Organ. Behav. Hum. Perform.* **1978**, *21*, 121–129. [CrossRef]
40. Han, F.; Zhang, Z. Expert Data Augmentation in Imitation Learning. *Proc. AAAI Conf. Artif. Intell.* **2023**, *37*, 16220–16221. [CrossRef]
41. Podvezko, V.; Podviezko, A. Kriterijų reikšmingumo nustatymo metodai. *Liet. Mat. Draugijos Darb.* **2014**, *55*, 111–116.
42. Mainul Bari, A.B.M.; Tanvir Siraj, M.; Paul, S.K.; Khan, S.A. A hybrid multi-criteria decision-making approach for analysing operational hazards in Heavy Fuel Oil-based power plants. *Decis. Anal. J.* **2022**, *3*, 100069. [CrossRef]
43. Beležentis, A.; Žalimaitė, M. Ekspertinių vertinimų taikymas inovacijų plėtros veiksnių analizėje: Lietuvos inovatyvių įmonių vertinimas. *Manag. Theory Stud. Rural Bus. Infrastruct. Dev.* **2011**, *3*, 23–31.
44. Bayanati, M.; Peivandizadeh, A.; Heidari, M.R.; Mofrad, S.F.; Sasouli, M.R.; Chbar, A.P. Prioritize Strategies to Address the Sustainable Supply Chain Innovation Using Multicriteria Decision-Making Methods. *Complexity* **2022**, *2022*, 1501470. [CrossRef]
45. Buallay, A. Is sustainability reporting (ESG) associated with performance? Evidence from the European banking sector. *Manag. Environ. Qual.* **2019**, *30*, 98–115. [CrossRef]
46. Roy, P.K. Enriching the green economy through sustainable investments: An ESG-based credit rating model for green financing. *J. Clean. Prod.* **2023**, *420*, 138315. [CrossRef]
47. Seyfi-Shishavan, S.A.; Gündoğdu, F.K.; Farrokhizadeh, E. An assessment of the banking industry performance based on intuitionistic fuzzy best-worst method and fuzzy inference system. *Appl. Soft Comput.* **2021**, *113*, 1568–4946. [CrossRef]
48. Roy, P.K.; Shaw, K. A credit scoring model for SMEs using AHP and TOPSIS. *Int. J. Financ. Econ.* **2023**, *28*, 372–391. [CrossRef]
49. Roy, P.; Shaw, K.; Ishizaka, A. Developing an integrated fuzzy credit rating system for SMEs using fuzzy-BWM and fuzzy-TOPSIS-Sort-C. *Ann. Oper. Res.* **2023**, *325*, 1197–1229. [CrossRef]
50. Aras, G.; Tezcan, N.; Furtuna, O.K.; Kazak, E.H. Corporate Sustainability Measurement based on Entropy Weight and TOPSIS: A Turkish Banking Case Study. *Meditari Account. Res.* **2017**, *25*, 391–413. [CrossRef]
51. Hani, E.; Zouhour, A.; Udo, B. Formulation of a corporate governance index for banking sector: The GIB.X62. *Heliyon* **2023**, *9*, e15253. [CrossRef]
52. Lapinskienė, G.; Achranovič, G.; Danilevičienė, I.; Baltrūnienė, V. Žaliosios bankų transformacijos vertinimas: Lietuvos atvejis. *Moksl. Taikom. Tyrim. Liet. Kolegijose* **2023**, *19*, 127–138. [CrossRef]
53. Lapinskienė, G.; Podviezko, A.; Tvaronavičienė, M. The state of international technology transfer in the Northern Europe region: Comparative analysis by modern multiple criteria methods. *Acta Montan. Slovaca* **2023**, *28*, 69–82. [CrossRef]