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INFORMATION AVAILABLE FROM MANDATORY REPORTS AND THE POSSIBILITY OF APPLYING RANKING METHODS: THE CASE OF POLISH PUBLIC BENEFIT ORGANIZATIONS

Keywords: Public Benefit Organization, Non-profit sector, Poland, MCDA, PROMETHEE II, TOPSIS.

J E L Classification: C44, C65, L31, M41.

Abstract: The aim of this paper is to present the possibility of assessing the economic results of Public Benefit Organizations (PBOs) by using ranking methods. These methods may be used not only by individual donors, but also by local or central government bodies, that decide on subsidies. Due to the lack of unified reporting system for non-

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profit organizations on a global scale, the additional aim of the paper is to present mandatory reports that must be prepared by Polish PBOs.

The theoretical part of the paper is the result of critical review of the law regulations in Poland and the literature in the field of non-profit reporting. The case study part of the paper is based on the example of PBOs from one of Polish voivodeships, operating in the field of 'Sport and recreation'. In the analysis conducted an approach called MAMIMCA – Multiple Assessment Multiple Importance Multiple Criteria Analysis – was used to determine the most suitable PBOs for co-funding. In the evaluation performed nineteen different criteria were taken into account, two well-known multi-criteria decision-aiding (MCDA) techniques were used (PROMETHEE II and TOPSIS) and two various vectors of weights were applied. As a result, the ranking of ten selected PBOs was received allowing to obtain a comprehensive picture of entities considered.

Introduction

The Public Benefit Organization (PBO) is a non-governmental organization, which obtained a special status introduced in 2003 into the Polish law by the Act on Public Benefit Activity and Volunteer Work. This status allows PBOs to obtain certain benefits, including additional sources of financing in the form of 1% of personal income tax (from 2023 it will be 1.5%). These organizations also have to fulfil additional requirements connected with mandatory annual reporting, which is an important source of information for different stakeholders.

According to the Statistics Poland, in 2020, there were 95.2 thousand of registered non-profit organizations in Poland. Almost 10% of these organizations had the status of public benefit organization (9.3 thousand) (Statistics Poland, News Release 2021). Taking into consideration that the share of PBOs in non-governmental organizations in Poland is rather small, organizations with this status may be perceived as the best organizations in the non-profit sector. Therefore, an important issue seems to be the purpose of this article, related to the indication of the possibility of assessing the economic effect of PBO using ranking methods. These methods may be used not only by individual donors, but also by local or central government bodies, that decide on subsidies. In 2020, 62.9% of the revenues of non-profit organizations in Poland were obtained in the form of non-market sources. In this category, 45.0% of the revenues came from public funds, including funds provided by central and local government administrative bodies (The non-profit sector in 2020, p. 26).

The important role of non-governmental organizations in our world is indisputable, even if we only consider the situation after the COVID-19 pandemic and refugees fleeing the war and military conflicts. Therefore, there is a great need to propose methods enabling the assessment of efficiency and effectiveness in these entities. In addition, it should be emphasized, that due to the lack of unified reporting system for non-profit organizations on a global scale, the presentation of mandatory reports that must be prepared by Polish PBOs may allow for the development of future research on both reporting of non-profit organizations and assessing the economic situation of these organizations in different countries.

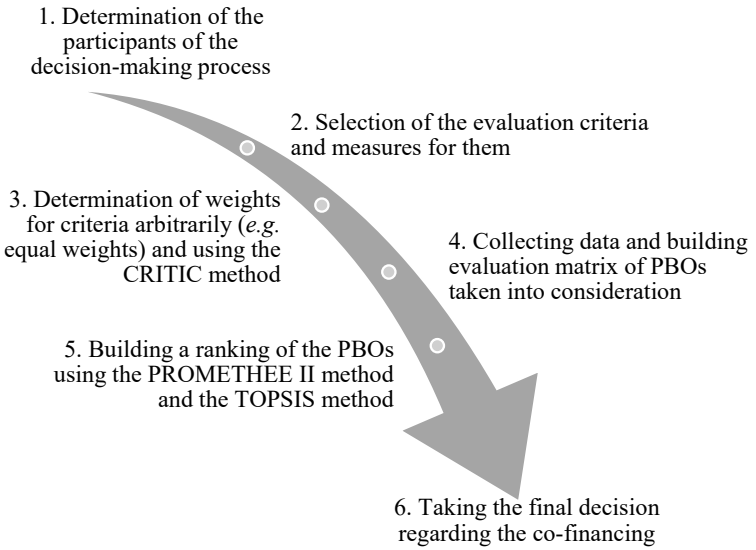
The article is organized as follows. In the next part, we indicate the research methodology and the course of the research process. In the third section, mandatory reports of PBOs in Poland are shown. Section four contains the case study based on the example of PBOs from one of Polish voivodeships, operating in the field of 'Sport and recreation'. In the analysis conducted an approach called MAMIMCA – Multiple Assessment Multiple Importance Multiple Criteria Analysis (Górecka, 2020) – was used to determine the most suitable PBOs for co-funding. Finally, the last section provides a summary and conclusions.

The research methodology and the course of the research process

The theoretical part of the paper is the result of critical review of the law regulations in Poland and the literature in the field of non-profit reporting. The case study part of the paper is based on two well-known multi-criteria decision-aiding (MCDA) techniques (PROMETHEE II and TOPSIS). The following PBOs evaluation procedure was used for the case study.

To build a ranking of public benefit organizations, for example to determine entities for public co-financing, a procedure presented in Scheme 1 can be applied.

Scheme 1. Procedure applied for PBOs evaluation



S o u r c e : own elaboration.

The procedure proposed is based on the approach called MAMIMCA – Multiple Assessment Multiple Importance Multiple Criteria Analysis (Górecka, 2020), in which various (at least two) multi-criteria decision-aiding (MCDA) methods and various (more than one) weighting coefficients for each evaluation criterion are used simultaneously to get a more comprehensive picture of the assessment. In this procedure, two well-established and worldwide popular multi-criteria techniques are used, namely the PROMETHEE II method (Brans & Vincke, 1985; Brans, Vincke & Mareschal, 1986) and the TOPSIS method (Hwang & Yoon, 1981). After weighing the pros and cons of different MCDA techniques (see Górecka, 2011; Górecka, 2012), these two were employed since they are considered user-friendly ones (understandable and mathematically uncomplicated). Moreover, they allow us to receive a complete pre-order of the alternatives (PBOs) to which the points are assigned in the final solution. It is important as the other form of the final solution (for example partial pre-order or graph) can be unconvincing for the potential users of the procedure. Below, two above-mentioned multi-criteria decision-aiding methods will be concisely presented.

Let us assume that $A = \{a_1, a_2, ..., a_m\}$ is a finite set of m alternatives (PBOs) defined by the decision-maker, $F = [f_1, f_2, ..., f_n]$ is a set of n evaluation criteria, $W = [w_1, w_2, ..., w_n]$ is a vector of weights for n evaluation criteria, where $\sum_{k=1}^{n} w_k = 1$ and $f_k(a_i)$ is the assessment of alternative a_i according to criterion f_k. These assessments exist in original descriptions of alternatives, may be determined by the decision-maker or obtained from experts, reports, catalogues, etc.

PROMETHEE II

The PROMETHEE II method consists of the following steps (Brans & Mareschal, 2005):

1. Defining a *generalized criterion* $\{f_k, P_k(a_i, a_j)\}$ for each criterion k; for the sake of simplicity, it is assumed that all criteria are maximized; f_k is a criterion k and $P_k(a_i, a_j)$ represents the preference function showing the strength of preference for alternative a_i over alternative a_j according to criterion k: $P_k(a_i, a_j) = F_k[d_k(a_i, a_j)] \ \forall a_i, a_j$, where $d_k(a_i, a_j) = f_k(a_i) - f_k(a_j)$ and for which $P_k(a_i, a_j) \in [0; 1]$. In order to facilitate this definition, six types of generalized criteria have been proposed. They are presented in Table 1.

Table 1. Types of generalized criteria

Generalized criterion	Preference function	Parameters
Type 1: usual criterion	$P_k(d_k) = \begin{cases} 0, & if \quad d_k \le 0 \\ 1, & if \quad d_k > 0 \end{cases}$	none
Type 2: quasi-criterion (u-shape criterion)	$P_k(d_k) = \begin{cases} 0, & if \quad d_k \le q_k \\ 1, & if \quad d_k > q_k \end{cases}$	indifference threshold q_k
Type 3: v-shape criterion	$P_k(d_k) = \begin{cases} 0, & if \quad d_k \le 0 \\ \frac{d_k}{p_k}, & if \quad 0 < d_k \le p_k \\ 1, & if \quad d_k > p_k \end{cases}$	preference threshold p_k
Type 4: level criterion	$P_k(d_k) = \begin{cases} 0, & if \quad d_k \le q_k \\ \frac{1}{2}, & if \quad q_k < d_k \le p_k \\ 1, & if \quad d_k > p_k \end{cases}$	indifference threshold q_k preference threshold p_k

Table 1. Types of generalized criteria

Generalized criterion	Preference function	Parameters
Type 5: pseudo-criterion (v-shape with indifference criterion)	$P_k(d_k)=\begin{cases}0, & if \quad d_k \le q_k \\ \frac{d_k-q_k}{p_k-q_k}, & if \quad q_k < d_k \le p_k \\ 1, & if \quad d_k > p_k\end{cases}$	indifference threshold q_k preference threshold p_k
Type 6: Gaussian criterion	$P_k(d_k)=\begin{cases}0, & if \quad d_k \le 0 \\ 1-\exp(\frac{-d_k^2}{2s^2}), & if \quad d_k > 0\end{cases}$	s_k (defines the inflection point of the preference function)

S o u r c e : Brans, Vincke & Mareschal, 1986.

In the evaluation procedure employed for the assessment of PBOs the first type of generalized criterion (usual criterion) was used for all criteria taken into consideration.

2. Calculation of the aggregated preference indices $\pi(a_i, a_j)$ for each pair of alternatives :

$$(a_i, a_j): \ \pi(a_i, a_j) = \sum_{k=1}^{n} w_k P_k(a_i, a_j), \tag{1}$$

where $\pi(a_i, a_j)$ shows the degree to which a_i is preferred to a_j over all the criteria.

3. Defining two outranking flows for each alternative a_i:

- the positive outranking flow: $\phi^+(a_i) = \frac{1}{m-1}\sum_{j=1}^{m}\pi(a_i, a_j)$, (2)
- the negative outranking flow: $\phi^-(a_i) = \frac{1}{m-1}\sum_{j=1}^{m}\pi(a_j, a_i)$. (3)

4. Calculation of the net outranking flow $\phi(a_i)$ for each alternative a_i:

$$\phi(a_i) = \phi^+(a_i) - \phi^-(a_i). \tag{4}$$

5. Construction of the final complete ranking of the alternatives according to the net flows $\phi(a_i)$ in descending order.

TOPSIS

The TOPSIS method is as follows (Roszkowska, 2011):

1. Construction of the normalized decision matrix:

$$\boldsymbol{X} = [x_{ik}] \tag{5}$$

where:

$$x_{ik} = \frac{f_k(a_i)}{\sqrt{\sum_{i=1}^{m} f_k(a_i)^2}} \tag{6}$$

for $i = 1, \ldots, m$ and $k = 1, \ldots, n$.

2. Calculation of the weighted normalized matrix:

$$\boldsymbol{V} = [v_{ik}] = [w_k x_{ik}] \tag{7}$$

where w_k is a weight of criterion k.

3. Determination of the positive ideal and negative ideal solutions.
   - Positive ideal solution is as follows:

$$A^+ = \{v_1^+, v_2^+, \ldots, v_n^+\} \tag{8}$$

$$\text{where: } v_k^+ = \begin{cases} \max v_{ik} \text{ for critera which are maximized,} \\ \min v_{ik} \text{ for criteria which are minimized,} \end{cases} \tag{9}$$

   for $i = 1, \ldots, m$ and $k = 1, \ldots, n$.
   - Negative ideal solution is as follows:

$$A^- = \{v_1^-, v_2^-, \ldots, v_n^-\} \tag{10}$$

$$\text{where: } v_k^- = \begin{cases} \max v_{ik} \text{ for criteria which are minimized,} \\ \min v_{ik} \text{ for criteria which are maximized,} \end{cases} \tag{11}$$

   for $i = 1, \ldots, m$ and $k = 1, \ldots, n$.

4. Calculation of the separation measures (distances) from the positive ideal solution and negative ideal solution:

$$d_i^+ = \left(\sum_{k=1}^{n} (v_{ik} - v_k^+)^p\right)^{1/p}, i = 1, 2, \ldots, m, \tag{12}$$

$$d_i^- = (\sum_{k=1}^{n}(v_{ik} - v_k^-)^p)^{1/p}, i = 1, 2, \ldots, m, \quad (13)$$

where p ≥ 1.

In the evaluation procedure employed for the assessment of PBOs it was assumed that p = 2.

5. Calculation of the relative closeness to the positive ideal solution:

$$S_i = \frac{d_i^-}{d_i^- + d_i^+}, \quad (14)$$

where $0 \leq S_i \leq 1$ and $i = 1, 2, \ldots, m$.

6. Construction of the final complete ranking of the alternatives according to the descending order of S_i.

Mandatory reports of Public Benefit Organizations in Poland

The analysis of available information is presented on the basis of mandatory, annual, separate reports, such as financial statements and performance reports, which are dedicated to the external stakeholders.

Taking into account the existing literature on PBOs, there are several studies that address the issue of its mandatory reporting. It should be noted, however, that generally only basic information is presented in English-language articles. This includes, for example, the general necessity that reports need to meet criteria of: completeness, accessibility, transparency, full disclosure and relevance (Dyczkowski, 2015b) or general obligations related to the preparation and publication of annual PBO reports (Piechota, 2015). There are also papers in which the authors present various research results obtained on the basis of data from mandatory PBOs' reports in Poland, but the scope and content of the reports are not examined (e.g.: Waniak-Michalak & Zarzycka, 2012; Dyczkowski, 2016; Chojnacka & Górecka, 2016; Chojnacka & Górecka, 2017; Chojnacka & Górecka, 2018; Chojnacka, 2020; Górecka & Chojnacka, 2017; Mamcarczyk & Zeniuk, 2020; Oliński & Szamrowski, 2020; Goldmann, 2021). Although in the literature it is possible to find publications that directly focus on the scope and content of PBO reporting (Żak, 2012), it should be emphasized that due to the introduction of a new regulation on financial statements in 2016, some of the previous publications present regulations that are not up to date. In addition, most of the

latest publications presenting applicable legal regulations are written in Polish (e.g.: Czaja-Cieszyńska, 2017; Chojnacka & Miścikowska, 2018; Nadolna & Rydzewska, 2021; Liżewski & Ostapowicz, 2022). As a result, the authors decided to present the general structure of mandatory PBOs reports in Poland as an additional purpose of this paper.

According to Polish Accounting Law of 29th September 1994, all reports have to be prepared in the Polish language and in the Polish currency. Sometimes the largest PBOs in Poland decide to prepare reports in a different language or currency, but this is an additional effort of the entity to be transparent and recognizable in the international society.

PBOs are obliged not only to prepare mandatory reports, but also to publish these reports in the online database of the National Freedom Institute – Centre for Civil Society (the Institute was established in 2017, before 2017 the Ministry of Labour and Social Policy was responsible for this database) (www1).

In Poland, PBO prepares annual financial statement in accordance with the legislation included in the Accounting Act of 29th September 1994. The annual financial statement consists of the balance sheet, profit and loss account, introduction to the financial statement and additional information. The scope of information reported in the financial statement of non-profit organizations is presented in Annex no 6 to the Accounting Act of 29th September 1994 (it was introduced in 2016). Table 2 presents the scope of balance sheet for non-profit organizations in Poland.

Table 2. Balance sheet for Polish non-profit organizations

Assets	Funds and liabilities
A. Non-current assets I. Intangible assets II. Tangible fixed assets III. Long-term receivables IV. Long-term investments V. Long-term prepayments B. Current assets I. Inventory II. Short-term receivables III. Short-term investments IV. Short-term prepayments C. Due payments to the statutory fund	A. Own funds I. Statutory fund II. Other funds III. Retained earnings or accumulated losses of previous periods IV. Net profit (loss) B. Liabilities and provisions for liabilities I. Provisions for liabilities II. Long-term liabilities III. Short-term liabilities IV. Accruals and differed income
Total assets	Total funds and liabilities

S o u r c e : Accounting Act of 29th September 1994, Annex no. 6.

The balance sheet according to Annex no. 6 presents assets and sources of financing these assets. Both assets and funds and liabilities are divided into main groups, as a result of which, the scope of information is generally similar to that presented by profit-oriented entities. Table 3 contains the scope of profit and loss account for non-profit organizations in Poland.

Table 3. Profit and loss account for Polish non-profit organizations

A. Revenues from statutory activities I. Revenues from unpaid public benefit activity II. Revenues from paid public benefit activity III. Revenues from other statutory activity
B. Statutory activity costs I. Costs of unpaid public benefit activity II. Costs of paid public benefit activity III. Other statutory activity costs
C. Profit (loss) from statutory activity (A-B)
D. Revenues from business activity
E. Costs of business activity
F. Profit (loss) from business activity (D-E)
G. General and administrative costs
H. Operating profit (loss) (C+F-G)
I. Other operating income
J. Other operating costs
K. Financial income
L. Financial costs
M. Profit before tax (loss) (H+I-J+K-L)
N. Income tax
O. Net profit (loss)

S o u r c e : Accounting Act of 29th September 1994, Annex no. 6.

The scope of the profit and loss account applies to certain groups of revenues and costs, that are characteristic of the activities of non-governmental organizations. In Poland, the main statutory activities of the PBO are divided into unpaid, paid and other statutory activity. The unpaid public benefit activity is

when PBOs do not receive remuneration for their activities, while the paid benefit activity occurs when PBOs obtain some remuneration from participants for realized activities. However, this remuneration or fee cannot be higher than the expenses connected with a given activity. The paid benefit activity also includes: the sale of manufactured goods or delivering services in the field of social and professional rehabilitation of people with disabilities or integration and professional and social reintegration of people with a risk of social exclusion as well as the sale of items, which were donated to organization (The Act of law of 24th April 2003 on Public Benefit and Volunteer Work, Article 7 and 8).

PBOs are also required to prepare an annual performance report. The form and content of this report are specified in the Regulation of the Chairman of the Public Benefit Committee of October 24, 2018 on template of the annual performance report and the simplified annual performance report of PBOs. Smaller PBOs, whose revenues do not exceed PLN 100,000 may prepare a simplified annual performance report. Other organizations with PBO status must prepare the unabbreviated annual performance report. The scope of information in the annual performance report includes:

1. PBO's data, among others, name of the organization, address, numbers of entries in National Court Register and in Statistics Poland, organization's authorities, type of public benefit activity and type of business activity.
2. Characteristics of the PBO's activity in the reporting period, territorial scope of statutory activities, number of recipients.
3. Revenues and costs of PBO in the reporting period: in comparison to the profit and loss account, an additional structure of financing sources is presented:
   - revenue from 1% of personal income tax (from 2023 it will be 1.5% of personal income tax),
   - revenue from public sources, such as European sources, central government and local government sources,
   - revenue from private sources, such as membership fees, donations, public collection, heritage, revenues from property, from business activity,
   - revenue from other sources.

   This section of the report provides additional information on costs, such as expenses financed from the 1% personal income tax.

4. The use by the organization of reliefs in the reporting period, e.g., tax exemptions for: corporate income tax, real estate tax, tax on civil law transactions, value added tax, stamp duty, court fee.
5. Staff of a PBO in the reporting period – number of employees, number of organization members, number of volunteers.
6. The value of salaries in the reporting period, among others, average monthly remuneration paid to the authorities of the organization, average monthly salaries paid to organization's employees.
7. Information on cash loans granted by a PBO in the reporting period.
8. Information on the tasks commissioned by central and local government bodies in the reporting period – information on the value of subsidies obtained from public sources and their tasks.
9. Information on public procurement carried out by a PBO in the reporting period.
10. Additional information, such as: list of companies in which the organization holds at least 20% of shares in the share capital or at least 20% of the total number of votes in the company's governing body, list of foundations in which the organization is the founder, information on controls carried out in the organization by public administration authorities in the reporting period or information whether the organization had its financial statement audited.

The content of the simplified annual performance report is broadly similar, but to some extent simplified comparing to an unabbreviated annual performance report.

Case study

The procedure described above was employed to assess ten PBOs from one of Polish voivodeships operating in the field of 'Sport and recreation'. Criteria affecting the ranking of the PBOs, divided into two parts, namely financial aspects and information and reputation aspects, have been determined through the literature review as well as based on the authors' own ideas. They are presented in Table 4 and Table 5.

Table 4. PBOs performance assessment criteria: financial ratings and sources of information

No.	Criterion (min/max/value of); (previous studies)	Measure – calculation formula	Source of information
f_{F1}	Average amount of aid per beneficiary (max)	cost of unpaid and paid statutory activities/number of beneficiaries	profit and loss account, annual performance report
f_{F2}	Average revenue generated by people involved in organization's activities (max)	total revenue/number of people involved in PBO's activities (employees, volunteers, members)	profit and loss account, annual performance report
f_{F3}	Change in revenue (max); (a)	(total revenue in current year – total revenue in previous year)/ total revenue in previous year	profit and loss account, annual performance report
f_{F4}	Change in expenses of statutory activities (max)	(total cost of unpaid and paid statutory activities in current year – total cost of unpaid and paid statutory activities in previous year)/total cost of unpaid and paid statutory activities in previous year	profit and loss account, annual performance report
f_{F5}	Labour cost in relation to total revenue (min)	gross salaries/total revenue	profit and loss account, annual performance report
f_{F6}	Alternative labour costs (max); (b), (c)	(number of volunteers*gross salaries)/employees	annual performance report
f_{F7}	Administrative costs ratio (% of administrative costs) (value of 6,5%); (a), (b), (c), (d), (e)	administrative cost/total cost	profit and loss account, annual performance report
f_{F8}	Financial stability ratio (value of 73); (b), (c)	cash and other short-term investments (in previous year)*365/total cost (in current year)	balance sheet, profit and loss account
f_{F9}	Debt level (< 30%; min); (f)	total current debt/total revenue	balance sheet, profit and loss account
f_{F10}	Fiscal deficits (scale -1;0;1; max); (f)	net profit/loss (within 2 years)	profit and loss account
f_{F11}	Change in number of beneficiaries (max)	(number of beneficiaries in current year – number of beneficiaries in previous year)/ number of beneficiaries in previous year	annual performance report

Table 4. PBOs performance...

No.	Criterion (min/max/value of); (previous studies)	Measure – calculation formula	Source of information
f_{F12}	Public and private revenue concentration ratio (% of public and private financing) (max)	(revenue from public sources + 1% of personal income tax + revenues from private sources including individual and institutional donations)/total revenue	annual performance report

(a) Charity Navigator (b) Dyczkowski (2015a) (c) Dyczkowski (2015b) (d) Frumkin & Kim (2001) (e) Trussel & Parsons (2008) (f) Penley (2012).

S o u r c e : own elaboration.

Table 5. PBOs performance assessment criteria: information and reputation ratings and sources of information

No.	Criterion (min/max/value of); (previous studies)	Measure – calculation formula	Source of information
f_{R1}	Activity scope (value of 36); (b), (c)	number of beneficiaries/ number of people involved in organization's activities	annual performance report
f_{R2}	Organization's age (max); (e)	the number of days an organization has PBO status	annual performance report
f_{R3}	Statutory goals and activities or projects (max); (c)	Do annual statements of an organization or its promotion materials define precisely statutory goals and activities or projects undertaken to achieve those objectives? (appraisal of the DM on scale 0-3)	annual performance report, organization's website
f_{R4}	Effects of activities (max); (c)	Do annual statements of an organization or its promotion materials disclose accurately effects of activities undertaken by the organization in the recent period? (appraisal of the DM using scale 0-3)	annual performance report, organization's website

Table 5. PBOs performance...

No.	Criterion (min/max/value of); (previous studies)	Measure – calculation formula	Source of information
f_{R5}	Beneficiaries of activities (max); (c)	Do annual statements of an organization or its promotion materials characterize thoroughly beneficiaries of activities conducted by the organization in the recent period? (appraisal of the DM using scale 0-3)	annual performance report, organization's website
f_{R6}	Organization's image (max); (c)	Does the website of the organization help to produce a positive image of the PBO? (appraisal of the DM on scale 0-3)	organization's website
f_{R7}	Organization's range of activity (max)	Appraisal on scale 1-3 depending on the territorial scope of the conducted activity (there are 9 options in the report starting from the nearest neighbourhood and ending with abroad)	annual performance report

(b) Dyczkowski (2015a) (c) Dyczkowski (2015b) (e) Trussel & Parsons (2008).

Source: own elaboration.

Tables 6, 7 and 8 present the values of measures for each entity from the point of view of nineteen criteria considered as well as two vectors of weights: in the first one all criteria are equally important and the second one was determined with the help of the CRITIC method (Diakoulaki, Mavrotas & Papayannakis, 1995).

Table 6. PBOs performance assessment: weights and measurement data – part 1

f_k	f_{F1}	f_{F2}	f_{F3}	f_{F4}	f_{F5}	f_{F6}	f_{F7}	f_{F8}
Goal	**max**	**max**	**max**	**max**	**min**	**max**	**0.065**	**73**
Weights 1 (equal)	0.053	0.053	0.053	0.053	0.053	0.053	0.053	0.053
Weights 2 (CRITIC)	0.043	0.055	0.047	0.049	0.049	0.061	0.049	0.060
ORG 1	2602.01	49574.16	-0.557	-0.449	0.003	89803.89	0.129	101.46
ORG 2	63.26	38693.67	0.069	0.382	0.291	0.00	0.004	15.26
ORG 3	11552.54	57162.96	-0.056	-0.033	0.059	0.00	0.017	0.00
ORG 4	0.76	5649.49	0.003	-0.073	0.065	114258.43	0.000	36.16
ORG 5	323.07	10042.98	0.447	0.244	0.290	0.00	0.000	0.87
ORG 6	2027.91	22699.35	-0.118	-0.429	0.068	47620.13	0.000	16.06
ORG 7	5232.42	57779.21	0.293	0.155	0.136	0.00	0.119	0.00
ORG 8	1720.09	6882.93	0.395	0.193	0.031	13190.22	0.000	0.60
ORG 9	732.32	13895.57	0.186	0.192	0.484	20343.49	0.000	0.00
ORG 10	218.61	14448.5	0.536	0.62	0.323	4911.32	0.000	11.40

S o u r c e : own elaboration.

Table 7. PBOs performance assessment: weights and measurement data – part 2

f_k	f_{F9}	f_{F10}	f_{F11}	f_{F12}
Goal	**min**	**max**	**max**	**max**
Weights 1 (equal)	0.053	0.053	0.053	0.053
Weights 2 (CRITIC)	0.051	0.073	0.042	0.048
ORG 1	0.008	0	-0.699	0.257
ORG 2	0.002	0	-0.286	0.336
ORG 3	0.208	1	-0.352	0.357
ORG 4	0.036	0	0.071	0.289
ORG 5	0.002	0	-0.158	0.541
ORG 6	0.000	1	0.000	0.726
ORG 7	0.000	1	-0.968	0.811

Table 7. PBOs performance...

f_k	f_{F9}	f_{F10}	f_{F11}	f_{F12}
Goal	**min**	**max**	**max**	**max**
ORG 8	0.000	1	5.694	1.000
ORG 9	0.000	1	0.063	0.638
ORG 10	0.000	0	0.567	0.491

S o u r c e : own elaboration.

Table 8. PBOs performance assessment: weights and measurement data – part 3

f_k	f_{R1}	f_{R2}	f_{R3}	f_{R4}	f_{R5}	f_{R6}	f_{R7}
Goal	**36**	**max**	**max**	**max**	**max**	**max**	**max**
Weights 1 (equal)	0.053	0.053	0.053	0.053	0.053	0.053	0.053
Weights 2 (CRITIC)	0.043	0.058	0.064	0.048	0.033	0.060	0.068
ORG 1	19.64	5008	3	3	1	3	1
ORG 2	628.57	5131	3	3	2	3	1
ORG 3	4.24	5078	1	3	1	3	3
ORG 4	7036.71	5359	1	1	1	3	2
ORG 5	28.48	4079	3	2	0	3	1
ORG 6	7.20	4406	3	3	1	2	1
ORG 7	8.92	3745	2	3	1	1	3
ORG 8	3.37	3020	2	2	1	2	3
ORG 9	18.15	1029	2	3	1	3	3
ORG 10	67.27	934	3	3	1	3	2

S o u r c e : own elaboration.

Tables 9 and 10 as well as Graph 1 provide the results obtained by applying the MAMIMCA approach with the PROMETHEE II method and the TOPSIS method.

Table 9. MAMIMCA approach – results obtained using PROMETHEE II and TOPSIS for two vectors of weights

No.	PROMETHEE II				TOPSIS			
	Weights 1 (equal)		Weights 2 (CRITIC)		Weights 1 (equal)		Weights 2 (CRITIC)	
	PBO	$\varphi(a_i)$	PBO	$\varphi(a_i)$	PBO	S_i	PBO	S_i
1	ORG 7	0.094	ORG 7	0.082	ORG 8	0.648	ORG 8	0.631
2	ORG 8	0.070	ORG 6	0.074	ORG 7	0.559	ORG 7	0.565
3	ORG 6	0.064	ORG 8	0.063	ORG 10	0.556	ORG 10	0.542
4	ORG 1	0.053	ORG 1	0.060	ORG 2	0.514	ORG 9	0.521
5	ORG 10	0.047	ORG 10	0.031	ORG 9	0.511	ORG 6	0.505
6	ORG 9	0.023	ORG 9	0.029	ORG 5	0.504	ORG 2	0.500
7	ORG 3	0.018	ORG 3	0.023	ORG 6	0.492	ORG 5	0.496
8	ORG 2	-0.012	ORG 2	-0.025	ORG 3	0.489	ORG 3	0.484
9	ORG 5	-0.129	ORG 5	-0.136	ORG 1	0.464	ORG 1	0.475
10	ORG 4	-0.228	ORG 4	-0.202	ORG 4	0.424	ORG 4	0.453

S o u r c e : own elaboration.

Table 10. MAMIMCA approach – rankings obtained using PROMETHEE II and TOPSIS for two vectors of weights

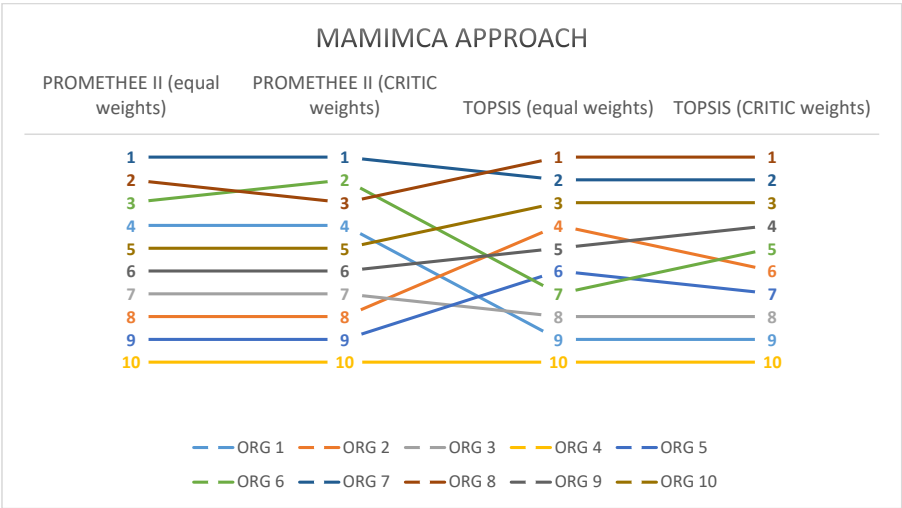
PBO	Place in the ranking				Sum
	PROMETHEE II (equal weights)	PROMETHEE II (CRITIC weights)	TOPSIS (equal weights)	TOPSIS (CRITIC weights)	
ORG 1	4	4	9	9	26
ORG 2	8	8	4	6	26
ORG 3	7	7	8	8	30
ORG 4	10	10	10	10	40
ORG 5	9	9	6	7	31

Table 10. MAMIMCA approach...

PBO	Place in the ranking				Sum
	PROMETHEE II (equal weights)	PROMETHEE II (CRITIC weights)	TOPSIS (equal weights)	TOPSIS (CRITIC weights)	
ORG 6	3	2	7	5	17
ORG 7	1	1	2	2	6
ORG 8	2	3	1	1	7
ORG 9	6	6	5	4	21
ORG 10	5	5	3	3	16

Source: own elaboration.

Graph 1. Results of the MAMIMCA approach with PROMETHEE II and TOPSIS and two vectors of weights



Source: own elaboration.

As a result of the whole analysis conducted it turned out that the rankings obtained are to some extent sensitive to changes in the weights of evaluation criteria and to selection of the multi-criteria decision-aiding method. An attempt to determine a compromise solution for both methods and both vectors

of weights has led us to conclude that the best entity for donation, taking into account its efficiency, effectiveness and reputation, is ORG 7 (it takes first place in the rankings of PROMETHEE II and second place in the rankings of TOPSIS). The second organization that can be considered for support is ORG 8 (it takes first place in the rankings of TOPSIS and either second or third place in the rankings of PROMETHEE II). On the other hand, the results obtained point out that the least preferred organization for co-financing is ORG 4 (which occupies the last spot in all rankings), the second worst for support is ORG 5, and the third worst one is ORG 3.

The outcome of the research process and conclusions

Assuming that the assessment of PBOs requires a structured approach, a functional framework for such evaluation was developed and presented in this article. The analysis performed used two appropriately selected multi-criteria techniques, namely: PROMETHEE II (Brans & Vincke, 1985; Brans, Vincke & Mareschal, 1986) and TOPSIS (Hwang & Yoon, 1981). They were combined within the MAMIMCA approach – Multiple Assessment Multiple Importance Multiple Criteria Analysis (Górecka, 2020).

Considering the pros and cons of various MCDA techniques, two above-mentioned methods were employed since, first of all, both of them are considered to be user-friendly ones and, furthermore, they allow us to obtain not only a ranking of the alternatives (PBOs) but also scores for them (net outranking flows or relative distances from the weighted ideal solution, depending on the method).

On the other hand, PROMETHEE II method requires from its users determination of the type of preference function for each criterion, as well as the values of the parameters associated with a particular type of preference function (for example indifference and/or preference thresholds). This may present some challenges for decision-makers. The problem can be solved by using the first type of generalized criterion, in which there are no parameters (as it was done in the conducted study). Nevertheless, in that case, differences between the assessments of alternatives are not fully taken into account – it does not matter by how much one assessment is better than another with respect to a given criterion. This is the price to pay for simplicity and the ability to be quickly understood by decision-makers who often have a minimal mathematical background.

According to the TOPSIS method, the most preferred alternative should have a profile which is nearest to the ideal solution and farthest from the anti-ideal solution. This approach is very intuitive and thus understandable for decision-makers. However, its weakness is the need to normalize the decision matrix, as different normalization formulas can lead to different final results (rankings).

The research conducted has shown that the best PBO in terms of efficiency, effectiveness and reputation is ORG 7. In turn, the worst entity for co-funding turned out to be ORG 4.

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