Steering the volunteering – Data Envelopment Analysis of volunteers' retention efficiency in civil society units

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STEERING THE VOLUNTEERING – DATA ENVELOPMENT ANALYSIS OF VOLUNTEERS' RETENTION EFFICIENCY IN CIVIL SOCIETY UNITS

Abstract

Civil society is positioned somewhere in the area between business, government, and private sector. As civil society organizations are not profit-oriented, they are often relying on the engagement of volunteers, i.e., workers who are not paid for their effort. Successful management of human resources in organizations that depends on volunteers' work can prove even harder than managing employees' work in business entities. Many factors influence someone's work effort, productivity, and devotion far beyond technical conditions, so it is impossible to separate someone's work from the rest of his/her personality traits. In civil society organizations, attracting, motivating, and keeping volunteers willing to conduct needed tasks and actively participate in the organization's activities might be quite challenging. For this paper, a survey was conducted among 42 organizations of civil society units (CSUs) that use the help of volunteers to fulfill their activities. To analyze relative efficiency of the civil society units, appropriate input and output variables were selected, and analysis was conducted with non-parametric DEA method. It was decided to take 4 inputs and 2 outputs in the analysis. The obtained results show that 69% of 42 CSUs are relatively efficient, 31% relatively inefficient, and 26.19% below the average. The results of the analysis enabled the identification of efficient and inefficient units. The reference set was calculated for each inefficient unit to determine which inputs cause better performance output. The calculated projections can be useful to CSU's managers and serve as a benchmark for detecting the source of inefficiency within their humanitarian organizations. They can also serve as guidelines for improving inputs and thus achieving higher levels of outputs, i.e., duration of volunteering and the number of volunteers.

Keywords civil society organizations, volunteers, Data Envelopment Analysis (DEA), human asset specificity

JEL Classification M54, C67, L31

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INTRODUCTION

In organizational sciences, human resources have always been recognized as one of key elements of an organization's success. Managing human labor has become one of the focal points of organizational science and practice since the beginning of the modern industrial era. During the first few decades of the 20th century, the focus was on the technical aspects of work. The works of Taylor, Gilberth, Fayo, and others greatly contributed to the huge increase in labor productivity and overall efficiency. For example, the task cycle for an average worker on Ford's assembly line shortened from 514 minutes in 1908 to 2.3 minutes in 1913, and all that before the introduction of the assembly line (Womack, Jones, & Ross, 2007, p. 26). The enlightenment that workers' efforts are influenced beyond just the technical aspects brought around the emphasis on human relations within organizations. Motivation theories that were developed during that period

helped to understand the complexity of human nature. Someone's effort at work is considered a result of various factors such as understanding of the importance of one's individual task and its contribution to the overall work, communication with peers, superiors, and subordinates, team spirit, inclusion in the decision-making process, etc.

The specificity of the human factor arises from the inseparability of one's work, personal traits, background, expectations, issues, motives, interests, beliefs, etc. Moreover, the effort itself and the person putting that effort are also inseparable, so the employee/worker has substantial control over the volume of physical and mental energy they are willing to invest. Unlike machines and equipment, humans are aware of their working environment, conditions, and the way they are treated. They are actively focused on changing the conditions they do not find beneficial. Therefore, due to human resources' unique nature, they present the greatest challenge for organization theory and management practice (Jaffee, 2008).

An important theoretical contribution to the understanding of the organizational issues related to managing labor (as a resource) was given by Williamson (2002). The focal point of his analysis is the relationship between an organization's decisions on managing its business transactions and asset specificity, which is closely related to the human factor.

When it comes to other, non-human resources, when there is no specificity involved, organizations can choose to obtain them on the market (buy). In cases when specificity occurs, pure market relations can prove to be inadequate. In such cases, organizations can opt for hazardous contractual relations without safeguards and firmer contractual relations that contain safeguards or internalization of transactions by building a new facility or buying a provider. Most organizations have to deal with human asset specificity due to different levels of skills and knowledge among its workforce and their different working experience. Organizations cannot and do not own people in the way that they own other resources. Therefore, managing human asset specificity is based on various types of contracts, from simple contracts for occasional transactions that do not involve specificity to employment contracts, which can contain some protection clauses. Challenges of managing human resources are often even bigger in organizations that use volunteers in at least part of their business operations. Volunteers are not being paid for their effort, they will rarely accept signing biding contracts, and their motivation and dedication might be different to those of regular workforce. Some of these challenges are addressed in the following section.

1. LITERATURE REVIEW

Managing the work of volunteers, especially in situations when human asset specificity occurs, is even harder than managing human resources in general. Even if organizations, which use volunteers with specific knowledge and skills, were to try to set these volunteers to sign strong, binding contracts, it is not to expect that many of them would agree.

When human resources are scarce (which is typically the case with volunteering), when organizations do not offer financial compensations for work, and when binding contractual relations are not applicable, managing human resources becomes even more demanding. In such an organizational environment, managers, besides their usually recognized tasks, should do their best to create "communityship," a word coined by Mintzberg (2017, 2009), implying a balance "between individual leadership on one side and collective citizenship on the other". Although he was not explicitly speaking about civil society organizations, his explanation that communityship as a non-egocentric but rather engaged and distributed leadership suits them perfectly. In other words, volunteers should not be used, but their talents, skills, and time should be utilized to make the volunteering experience more meaningful to the volunteers and more productive for the organization (Kummerfeldt, 2011). Charities and other similar organizations are constantly trying to balance between the needs of the organization and the needs of the collective. Many of them are attempting to become more professional by paying for work in

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the key parts of their organizations because professionalization leads to an increase in efficiency (Parsons, 2004; Parsons & Broadbridge, 2007).

A volunteer is a person who freely offers to take part in an enterprise or undertakes a task or who works for an organization without being paid (Oxford Living Dictionaries). Many factors may attract someone to become a volunteer: social needs, family needs, overcoming some life transition, search for companionship, strengthen social ties, extension of formal workplace relationships, self-realization, etc. (Bains, Lie, & Wheelock, 2006). Although volunteering from an economic perspective can be perceived as irrational, those who donate their time and expertise can get some internal satisfaction – a "warm-glow" – joy from giving (Andreoni, 2015). For working people, volunteering can be seen as a leisure activity, or at least something between work and leisure (Holmes at al., 2010). However, spending a part of the leisure for volunteering is understandable as volunteering is known for having a positive effect on a few volunteers' aspects of well-being: self-reported life satisfaction, happiness, health, life mastery (Huang, 2019). From a marketing standpoint, volunteers should be perceived as customers as they are a heterogeneous group with various qualities, skills, and backgrounds. They can decide to buy or not to buy, and if they buy, they may or may not become a loyal customer (Dolnicar & Rendle, 2004). Although volunteers may be found in almost every human activity, the focus of this paper is primarily on managing volunteers in civil society organizations and/or non-governmental organizations (NGO)[1]. Most civil society organizations rely on voluntary work for the fulfillment of (at least a part of) their activities and many of them are dependent on it.

As many people these days work very hard and have limited time to spend with their families and on their hobbies, attracting volunteers can be challenging for most organizations. This is especially evident now with the constant depopulation of many countries in Europe, including Croatia. Fortunately, the civil society in Croatia still seems to be growing, and the database provided by the Croatian Ministry of Public Administration is currently counting 50.5 thousand active NGOs (Croatian Ministry of Public Administration). The number would be even higher if local branches of some well-known humanitarian organizations like Caritas were included. Small, yet the most numerous, units of Caritas are organized on a parish level and are not recognized as legal entities. These organizations, like many others, rely mostly on voluntary work. The importance of civil society organizations in Croatia is expected to grow because the Ministry of Agriculture is actively working on establishing a sustainable food donation system. Although the organizational design of the food bank system is not yet finished, organizations of civil society and their volunteers will, in any case, serve as a link between food banks and final recipients of the humanitarian aid (Lovrencic, Vretenar, & Jezic, 2017).

Managing activities done by volunteers can prove to be very hard, sometimes even frustrating. As they are not being paid for their work, even if they have a signed contract with the organization they agreed to volunteer for (which is often not the case), there are typically no legal and, certainly, no financial consequences for volunteers who do not perform well or do not perform at all. When volunteers neglect their duties, an organization will eventually just stop relying on that person. Therefore, most of the voluntary work is done based on hazardous contractual relations. There is a different psychological contract between volunteers and the organization where they work (M. Kim, Trail, Lim, & Y. Kim, 2009).

An additional worry for organizations relying on volunteers' work is turnover – the number of volunteers leaving the organization who have to be replaced. As argued by Ficher and Schaffer (1993), high turnover is especially serious when an organization requires volunteers with special skills, when they require intensive training, or when the job needs long-term commitments. Motivating and retaining volunteers is closely connected with them having positive experiences with volunteering. A positive experience in volunteering is perceived as the one that allows volunteers to feel needed and appreciated, allows them to feel a sense of accomplishment, provides job satisfac-

1 Civil society organizations and non-governmental organizations do not necessarily need to be the same ones, but for this paper, they will not be differentiated.

tion, offers opportunities to develop friendship, etc. (Starnes & Wymer, 2001)

Although efforts to keep running the activities of a civil society organization heavily dependent on volunteers' work might seem futile, many civil society organizations are rather successful in "steering" the volunteering. Someone might rightfully argue that it is just a matter of believing in a good cause. Therefore, people are not equally motivated to serve as volunteers in different organizations or different projects. Even if they have high motivation to volunteer, it is for them to decide to participate in a specific project, the opportunity needs to fit in with the rest of their lives (West & Pateman, 2016). An organization's ability to persuade others to believe in a good cause is necessary to attract and keep volunteers active, but it is not enough. Many issues like bad management of human relations, flaws in organization of activities, lack of success in presenting the importance of work done by volunteers, or appreciations toward their efforts will quickly steer them away from volunteering at least for that organization. Considering all this, it seemed important to gather the data related to volunteering in civil society organizations and analyze them using the DEA method.

2. SAMPLE AND DATA

In Croatia, four regional hubs in the settled biggest cities network will volunteers with civil society organizations that need their services. Their publicly available data on civil society organizations (NGOs) were used to obtain e-mail addresses for 202 NGOs. Fifty-six of these NGOs are from the western part of the country, 131 from central parts, including the capital city and surrounding area, and 15 from the southern part of the country. Additionally, 96 e-mail addresses of Croatian's Red Cross (80) and Caritas (16) branches were obtained. In total, 298 organizations were contacted by e-mail with a request to participate in this survey. The survey was conducted in 2018 using an on-line questionnaire composed of 44 questions. Fourteen percent of contacted organizations completed the questionnaire (42 organizations in total). According to the scope of their activities, most of them are involved in social or humanitarian activities (28), educational activities (5), religious activities (4), youth-related activities (3), etc. Most organizations in the sample claimed that they have more than 26 active volunteers and their scope of activities is local (Figure 1). Most organizations (83.3 %) have more female than male volunteers, and most volunteers are between 21 and 40 years old and are typically staying in organizations for a few years (59.5%).

Besides the demographic data, questions in the questionnaire were grouped into six sections. The first section was comprised of questions about attracting and including volunteers in an organization. The second section questioned organizational, communication, social, and computer skills required from volunteers. The third and fourth sections were about application forms for volunteers and the selection process. The fifth section was about occurrence and reasons for absenteeism among volunteers. The questions in the sixth section were routed to find out if there is a formal

Source: Authors.

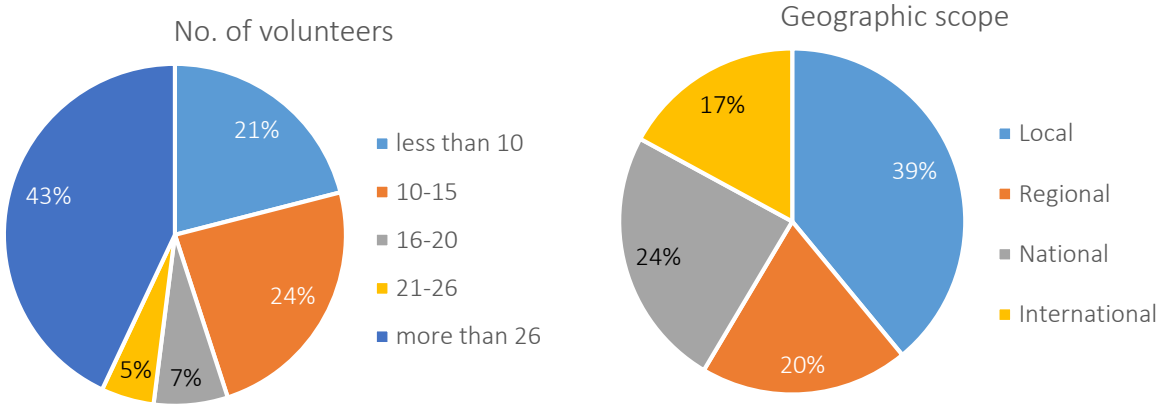

Figure 1. Organizations in the sample

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contract between an organization and a volunteer, opportunity for additional training to acquire needed skills, system of stimulations (rewards and/or punishments) for provided effort.

Most respondents expressed that securing a sufficient number of volunteers is moderately hard. When they were asked about the working experience of their volunteers and their time available for volunteering, most answers were neutral as 50% and 42.9%, respectively, have chosen neutral answer (3) on a Likert scale (1-5). However, most respondents think that their volunteers have altruistic motives (66.7%) and that their organizations enable their volunteers to do their work in adequate social and organizational conditions (95.2%). According to responses from the sample, during the interview, it is important to understand candidates' motives for applying for volunteering, their general expectations, and assessment of time they can afford to invest.

In a question about the absenteeism of their volunteers, 45.2% of the respondents in the survey reported that volunteers are often or very often absent without announcement. When asked to estimate reasons for volunteers to quit working for their organization, most respondents emphasized that volunteers had a lack of affordable time (69.1%). They mostly think that it was not the problem that the work within the organization failed to meet the expectations of the volunteers (70.1%). Very few of them (7.2%) concluded that their volunteers had skipped working in another organization.

When asked to assess the importance of skills that are important for volunteers, they have put most emphasis on social skills (average grade 4.21), while computer skills are not seen as important (average grade 2.66) (Figure 2).

Most respondents (57.1%) stated that their organization offers some kind of training/education needed for work done by volunteers. As many as 71.5% of organizations in the sample have some kind of rewards for highly motivated volunteers, and just 11.9% has some kind of sanctions for those who are least motivated. In 42.9% of organizations from the sample, there is no written contract between the organization and volunteers.

For further analysis, the Data Envelopment Analysis (DEA) was chosen. To use DEA, parts of gathered data needed to serve as inputs and outputs in this analysis were picked. The selected inputs and outputs are explained in the following part of this paper.

3. METHODOLOGY

As non-governmental organizations are usually non–profit organizations, it is logical to evaluate their performance according to aspects other than financial. Most non-profit organizations are aimed at creating social impact and, therefore, should be evaluated concerning specific inputs/outputs. Epstin and McFarlan (2011) developed a performance metrics for non-profit organizations by grouping the organization's activities into five categories in line with the theory of change: input, activity, output, results, and impact. This research went a step further and fused this theory with Data Envelopment Analysis (DEA) to determine the efficiency level for 42 CSU (civil society units)

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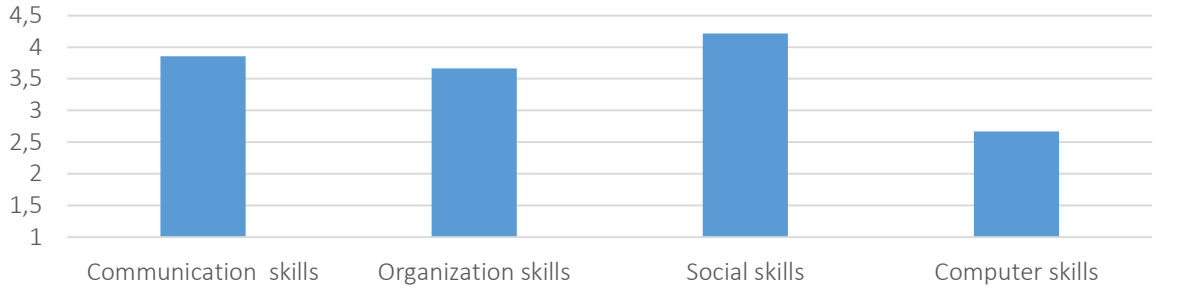

Figure 2. Importance of volunteers' skills

concerning their ability to find, motivate, and retain volunteers.

Data Envelopment Analysis is known as a nonparametric data-oriented approach commonly used for evaluating the efficiency of non-profit organizations like hospitals (Rabar, 2010), local government units (Jardas Antonić, Vretenar, & Host, 2017), universities (Visbal-Cadavid, Martínez-Gómez, & Guijarro, 2017), and humanitarian organizations (Kim & Lee, 2018; Tofalis & Sargeant, 2000). The level of efficiency in this analysis is measured by empirically calculating an envelope (frontier) that serves as the reference set for evaluating individual CSUs efficiencies, so it represents ideal tool for benchmarking.

Being compared with other methods, DEA has numerous advantages, and some of them are:

- considering simultaneously multiple outputs and inputs in different measurement units;
- measuring relative efficiency and, therefore, is suitable for benchmarking because it suggests relative competitiveness by measuring the relative efficiency of the business entity to the efficient entity from the reference set;
- it can find if the inefficiency exists and it can suggest potential improvements using projections;
- for each inefficient unit, it calculates its own reference set;
- it is more practical than econometrics.

The most frequently used models in Data Envelopment Analysis are the CCR (Charnes-Cooper-Rhodes) and the BCC (Banker-Charnes-Cooper) models. According to them, for each decision-making unit (CSU), virtual inputs, virtual outputs, and weights v_i and u_r are formed. Four general assumptions were followed for each selected input and output (Cooper, Seiford, & Tone, 2006):

a) data should be available and have positive values for each input and output;

b) inputs, outputs, and selected CSUs should reflect management, i.e., analyst's interest in the components entering the evaluation of the relative efficiency;

c) the results of efficiency should be a reflection of the principle according to which a smaller amount of inputs and a larger quantity of output is preferable;

d) various inputs and outputs may be expressed in different measurement units.

If it is assumed that m inputs and s outputs satisfy the first two assumptions, and if input and output vectors are given as $\left(x_{1j}, x_{2j}, x_{3j}, ..., x_{mj}\right)$ and $\left(y_{1j}, y_{2j}, y_{3j}, ..., y_{sj}\right)$, then the relative efficiency of every CSU is measured once in line with the selected data. This means that n optimization problems should be solved, one for each CSU_j for $j = 1,\ldots n$. The model aims to form a virtual output and input for every DMU by using output weights (u_r) $(r = 1,..., s)$ and input weights (v_i) $(I = 1,..., m)$. The main goal is to determine the weights that maximize their ratio.

The problem is represented by Cooper, Seiford, and Tone (2006) in fractional programming form as follows:

$$\left(RP_o\right) \qquad \max_{u,v} \theta = \frac{u_1 y_{1o} + u_2 y_{2o} + \ldots + u_s y_{so}}{v_1 x_{1o} + v_2 x_{2o} + \ldots + v_m x_{mo}}$$

with respect to $\frac{u_1 y_{1j} + u_2 y_{2j} + \ldots + u_s y_{sj}}{v_1 x_{1j} + v_2 x_{2j} + \ldots + v_m x_{mj}} \leq 1$

$$j = 1, \ldots, n$$

$$u_1, u_2, \ldots, u_s \geq 0$$

Once the CSU_j is evaluated based on the CSU_o, ranging from 1 to n, the fractional programming can be expressed in a linear form to obtain values for input weights v_i (i=1,…,m) and output weights u_r $\left(r = 1, \ldots, s\right)$[2]. The fractional programming problem can thus be transformed into the linear programming form and can be solved.

The constraints ensure that the ratios of "virtual output" and "virtual input" do not exceed value 1

2 Values u_r and v_i represent the variables of the given problem.

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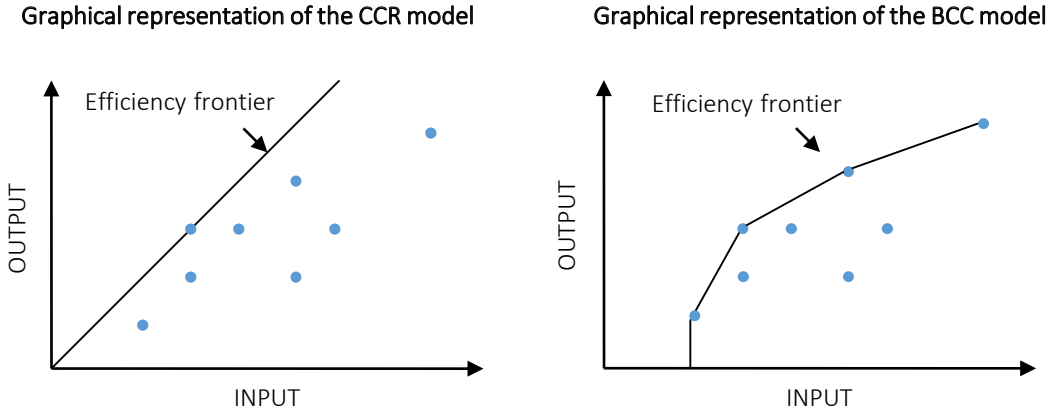

Figure 3. Graphical representation of the CCR and BCC models

for each CSU. The main goal is to obtain weight values (v_i) and (u_r) that maximize the ratio of evaluated unit. In accordance to the defined constraint set, the optimum value obtained for θ^* is 1.

The CCR and the BCC models differ in one condition. The BCC model includes an additional condition of convexity, thus achieving that the frontier has piecewise linear and concave features, leading to the concept of variable return to scale, as shown in Figure 3. The efficiency is the envelope spanning between efficient solutions (CSU) from the reference set

$$E_o^{/} = \left\{ j : \sum_{r=1}^{s} u_r^* y_{rj} = \sum_{i=1}^{m} v_i^* x_{ij} \right\}_3 .$$

In the initial analyses, there were two additional inputs. However, as they were negatively correlated with outputs, it was decided to exclude them from further analysis. It was then decided to evaluate CSUs concerning four inputs and two outputs:

Selected inputs	Selected outputs
x_{1j} – business conditions (I_1) x_{2j} – number of absence (I_2) x_{3j} – educational level of volunteers (I_3) x_{4j} – awards and privileges (I_4)	y_{1j} – length of volunteering (O_1) y_{2j} – number of volunteers (O_2)

Data Envelopment Analysis is adequate to analyze the efficiency in civil society organization units volunteering because it represents a problem of multiple inputs/outputs with different measurement units. In this problem, Data Envelopment Analysis is used to analyze the relative efficiency of 42 civil society units in the Republic of Croatia. The total number of inputs and outputs is limited; i.e., it should not exceed 1/3 of civil society units taken into analysis. One of the main traps of the Data Envelopment Analysis is that efficiency scores are sensitive to the number of included inputs and outputs. Namely, the DEA methodology has limitations regarding the number of inputs and outputs. The efficiency scores can be overestimated in cases when the number of inputs and outputs is too high concerning the number of variables, i.e., observations. According to the studied literature, overestimation can be prevented if the number of inputs and outputs is tied to the number of CSUs (number of observations/ number of observed units) in the following way (Dyson, Allen, Camanho, Podinovski, Sarrico, & Shale, 2001): n (number of observations) > $2ms$, where m and s represent the number of inputs and outputs, respectively. Another relevant solution in determining the adequate number of inputs/outputs, according to Raab and Lichty (2002), is given either by the relation $n > 3(m+s)$ or according to Despotis (2002), where $n \geq \max\{m^*s; 3(m+s)\}$. In this case, the maximum number (in sum) of inputs/outputs should not exceed 14 because the analysis results might be arguable. The decision on the number of selected inputs and outputs is based on the assumption that

3 According to CCR efficiency definition, DMU is CCR efficient if $\theta^* = 1$ and if there is at least one optimal solution (v^*, u^*) for which the following applies: $v^* > 0,\ u^* > 0$.

the sum of selected inputs and outputs should be at least two or even three times smaller than the number of units included in the analysis. As a result, it was decided to take 4 inputs and 2 outputs in the sum into the analysis. Data Envelopment Analysis models can be output or input-oriented. Orientation is chosen according to the nature of the problem or the researcher's perspective. In an input orientation, the DEA minimizes the input for a given level of output; in other words, it indicates how much a DMU can decrease its input for a given level of output. In an output orientation, the DEA maximizes the output for a given level of input; in other words, it indicates how much a DMU can increase its output for a given level of input.

According to the nature of the problem, the output-oriented model was selected in which the projections are calculated in that the same amount of inputs maximizes the outputs (number of volunteers, i.e., time spent volunteering).

4. RESULTS

In the initial analyses, two basic output models were used: the CCR output-oriented model and the BCC output-oriented model. The obtained general and individual results are presented in Tables 1 and 2.

Table 1. General results

Source: Authors' calculation.

Model	CCR	BCC
Number of CSU	42	42
Number of relatively efficient CSU	21 (50%)	29 (69%)
Average	0.8343	0.89
Max value	1	1
Min value	0.2576	0.2576
Number of relatively inefficient units under the average value	18	11

The initial results showed a representative difference in the number of units found efficient by these two models, i.e., 50% and 69%, respectively (Table 1). This significant difference implies the appearance of the variable return to scale (VRS), which further implies that changes in inputs do not cause a linear increase in the length of volunteering and the number of volunteers in this case. Therefore, only the BCC output-oriented model was continued to be used.

The obtained results by the BCC output-oriented model show that 69% of 42 CSUs taken into the analyses are relatively efficient, 31% relatively in-

Table 2. Efficiency results concerning basic models

Source: Authors' calculation.

BCC model results				CCR model results			
No.	DMU	Score	Rank	No.	DMU	Score	Rank
1	CSU1 LGBT,H, EDUC	0.75	34	1	CSU 1 LGBT,H, EDUC	0.75	31
2	CSU2 OOU	0.2727	41	2	CSU 2 OOU	0.2727	41
3	CSU3 OOU	1	1	3	CSU 3 OOU	1	1
4	CSU4 OOU, ZZŽ	1	1	4	CSU4 OOU, ZZŽ	1	1
5	CSU5 NFO	1	1	5	CSU5 NFO	0.7143	35
6	CSU6 UM	1	1	6	CSU6 UM	0.7937	29
7	CSU7 UM	0.5	38	7	CSU7 UM	0.3571	39
8	CSU8 OUK	1	1	8	CSU8 OUK	1	1
9	CSU9 SZU	0.75	34	9	CSU9 SZU	0.5357	37
10	CSU10 SHDU	0.8	32	10	CSU10 SHDU	0.8	26
11	CSU11 SHDU	1	1	11	CSU11 SHDU	1	1
12	CSU12 SHDU	1	1	12	CSU12 SHDU	1	1
13	CSU13 SHDU	1	1	13	CSU13 SHDU	1	1
14	CSU14 SHDU	1	1	14	CSU14 SHDU	0.8223	25
15	CSU15 SHDU	1	1	15	CSU15 SHDU	0.7954	27
16	CSU16 SHDU	1	1	16	CSU16 SHDU	1	1
17	CSU17 SHDU	1	1	17	CSU17 SHDU	1	1
18	CSU18 SHDU	1	1	18	CSU18 SHDU	1	1
19	CSU19 SHDU	1	1	19	CSU19 SHDU	1	1
20	CSU20 SHDU	1	1	20	CSU20 SHDU	0.7954	27

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Table 2 (cont.). Efficiency results concerning basic models

BCC model results				CCR model results			
No.	**DMU**	**Score**	**Rank**	**No.**	**DMU**	**Score**	**Rank**
21	CSU21 SHDU	1	1	21	CSU21 SHDU	0.8636	24
22	CSU22 SHDU	1	1	22	CSU22 SHDU	1	1
23	CSU23 SHDU	1	1	23	CSU23 SHDU	1	1
24	CSU24 SHDU	1	1	24	CSU24 SHDU	1	1
25	CSU25 SHDU	0.75	34	25	CSU25 SHDU	0.75	31
26	CSU26 SHDU	1	1	26	CSU26 SHDU	1	1
27	CSU27 SHDU	0.75	34	27	CSU27 SHDU	0.75	31
28	CSU28 SHDU	0.9697	30	28	CSU28 SHDU	0.7924	30
29	CSU29 SHDU	0.7879	33	29	CSU29 SHDU	0.6438	36
30	CSU30 SHDU	0.9091	31	30	CSU30 SHDU	0.7429	34
31	CSU31 SHDU	1	1	31	CSU31 SHDU	0.9107	22
32	CSU32 SHDU	0.5	38	32	CSU32 SHDU	0.5	38
33	CSU33 SHDU, OOU	1	1	33	CSU33 SHDU, OOU	1	1
34	CSU34 SHDU, OOU	1	1	34	CSU34 SHDU, OOU	1	1
35	CSU35 SHDU, UM	1	1	35	CSU35 SHDU, UM	1	1
36	CSU36 SHDU, VZ	1	1	36	CSU36 SHDU, VZ	1	1
37	CSU37 SHDU, VZ	1	1	37	CSU37 SHDU, VZ	1	1
38	CSU38 SPU	0.3846	40	38	CSU38 SPU	0.2857	40
39	CSU39 SUU	0.2576	42	39	CSU39 SUU	0.2576	42
40	CSU40 OI	1	1	40	CSU40 OI	1	1
41	CSU41 VZ	1	1	41	CSU41 VZ	0.9067	23
42	CSU42 VZ	1	1	42	CSU42 VZ	1	1

efficient, and 26.19% below average. All input and output values taken into the analysis are positively correlated, which confirms that the input and output data are well selected. The results also indicate that privileges and a higher number of volunteers do not automatically imply a higher level of efficiency.

In Table 3, the reference sets for eight inefficient CSUs are presented. The frequency of the appearance of a particular CSU in the reference sets confirms its ranking as an efficient unit. Namely, since all efficient units are rated with the maximum value of 1, the re-occurrence of a CSU in reference sets can tell us just how "strong" that evaluation really is. Also, one of the advantages of DEA lies in the possibility to calculate projections, which may serve as benchmarks for improving efficiency. The projections for every inefficient unit in the sample were calculated. For example, CSU25 has only one CSU (CSU12) in the reference set. This means that CSU25 can improve its performance if it takes CSU 12 as an example of good practice that generally implies that with an equal level of inputs, it can improve outputs, length of volunteering, and the number of volunteers. However, after calculating projections for the inefficient unit (Table 4), it can be seen that CSU12 has achieved a higher level of volunteers and length of volunteering with the same level of inputs in comparison to CSU25. According to the projections, CSU25 can improve its performance with the same level of inputs; edu-

Table 3. Reference set table

Source: Authors' calculation.

No.	CSU	Score	Rank	Reference set (LAMBDA)			
9	CSU9 SZU	0.75	34	CSU14 SHDU	0.75	CSU18 SHDU	0.25
25	CSU25 SHDU	0.75	34	CSU12 SHDU	1		
27	CSU27 SHDU	0.75	34	CSU12 SHDU	0.867	CSU16 SHDU	0.133
7	CSU7 UM	0.5	38	CSU14 SHDU	0.75	CSU35 SHDU, UM	0.25
32	CSU32 SHDU	0.5	38	CSU16 SHDU	0.824	CSU18 SHDU	0.176
38	CSU38 SPU	0.3846	40	CSU16 SHDU	1		
2	CSU2 OOU	0.2727	41	CSU37 SHDU, VZ	0.333	CSU40 OI	0.667
39	CSU39 SUU	0.2576	42	CSU37 SHDU, VZ	0.118	CSU40 OI	0.882

Table 4. Example of CSU projections

Source: Authors' calculations.

			Length of volunteering			Number of volunteers		
DMU	Score	Rank	Data	Projection	Diff.(%)	Data	Projection	Diff.(%)
CSU25 SHDU	0.75	34	3	4	33.333	12	18	50

Table 5. Comparison between efficient unit from the reference set and associated inefficient unit

Source: Authors' calculations.

DMU	(I) Terms of business	(I) Absence	(I) Training	(I) Reward	(O) Length of volunteering	(O) No. of volunteers
CSU12 SHDU	4	1	2	4	4	18
CSU25 SHDU	4	1	2	4	3	12

cational level, awards and privileges, business conditions, and number of absence, and still the number of volunteers can be raised by 50% (i.e., for six volunteers more) and the length of volunteering by 33.3% (Table 5). Thus, it will be moved to the efficiency frontier and become relatively efficient. The same interpretation can be given for each inefficient unit using its reference set and projections.

The reason for inefficiency could be found in the volunteers' age, or maybe business conditions do not include the possibility for improvement, so administrative managers may include more effort to motivate volunteers to stay and to raise their number. Also, volunteers' inner motivation can be a crucial factor because most of the efficient CSU are from the humanitarian spectrum, and that can also be the reason for the long length of volunteering.

Projections can be very useful to CSU's administrative managers and serve as a benchmark for detecting the source of inefficiency within their humanitarian organizations. At the same time, projections can serve as guidelines for improving inputs and, thus, achieving higher outputs, i.e., length of volunteering and number of volunteers.

CONCLUSION

It is rather difficult to measure the efficiency of organizations operating within the civil sector, especially non-profit organizations, where the focus is more on social impact then the financial outcome. Furthermore, the success of business activities of civil society organizations is almost entirely dependent of human resources, i.e., the enthusiasm of individuals and the working atmosphere. These two features, as it is well known, are intangible and hard to measure. This problem is even broader because civil society organizations are faced with a constant lack of high-quality human resources or human resources per se. Data Envelopment Analysis (as a non-parametric method) is very adoptable toward different measurement units (i.e., they can be quantitative or qualitative). It enabled us to measure the efficiency of CSUs various variations of inputs and outputs. In this paper, DEA was used to explore the efficiency of 42 selected civil society units in volunteering. It was based on four selected inputs (business conditions, absence, volunteers' educational level, and received awards/privileges) and achieved outputs (length of volunteering, number of volunteers).

The analysis showed that according to the BCC model, 69% of the analyzed 42 CSUs are relatively efficient, 31% relatively inefficient, and 26.19% below average. Using the BCC model, the projections and reference sets were calculated and might prove useful to decision-makers (CSU managers) and serve as a guideline to improve efficiency levels. Another advantage of the DEA method is that it measures the relative efficiency among entities that work in similar conditions, enabling each entity to be compared with others in its group. This allows the entity to detect the sources of its inefficiency. This way is easier

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to detect sources of inefficiency. If more quantitative data could be obtained and used as an input (like financial data, participation in and organization of humanitarian and other events, etc.), the analysis would surely yield better and more accurate results. Moreover, additional data would enable us to use the categorical variable to differentiate CSUs within groups. From the perspective of efficient units, analysis can be improved by using the super-efficiency model to get a distinction between efficient CSU.

In future research on this issue, DEA can be combined with other methods such as regression or multi-criteria analysis to get more detailed quantitative results, or to compare ranked units, respectively. Despite these limitations, the value of this research lies in its empirical approach to efficiency analysis, their ranking into efficient and inefficient units, and possibilities of improvement in the form of projections.

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