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EFFICIENCY ANALYSIS OF NON-PROFIT YOUTH WORK ORGANISATIONS IN ESTONIA

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I hereby declare that I have compiled the thesis independently
and all works, important standpoints and data by other authors
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ABSTRACT

Researches related to the efficiency performance of for-profit businesses are common enough. The analysis of non-profit organisations have so far been quite scant as it is difficult to find the right approach to the measurement of efficiency of organisations, which main aim is to benefit the society rather than to make a profit. Efficiency measurement is one of the key factors that reflects how well an organisation uses resources to achieve its core purpose of existence and mission. This thesis presents various methods for assessing the efficiency of non-profit organisations. The study focuses on 16 nationwide youth work organisations that are strategic partners of the Estonian Ministry of Education and Research and which receive an annual grant from this institution. The output-oriented Data Envelopment Analysis is used as a main measurement tool. In the course of the study, it turned out that 8 out of 16 organisations are ineffeciently using their resources and the author emphasizes which parameters should be improved by organisations. This is, moreover, the first study of its kind in Estonia.

Keywords: non-profit organisations, youth associations, efficiency measurements, Data Envelopment Analysis

LIST OF ABBREVIATIONS

4H – Youth Association Estonia 4H (Noorteühing 4H)

AE – Allocative Efficiency

ANK – Association of Estonian Open Youth Centers (Eesti Avatud Noortekeskuste Ühendus)

BCC – Banker, Charnes and Cooper model

CCR – Charnes, Cooper and Rhodes model

CRS – Constant Returns to Scale

DEA – Data Envelopment Analysis

DMU – Decision-making unit

EE – Economic Efficiency

EGL – Estonian Association of Girl Guides (Eesti Gaidide Liit)

EHKL – Estonian Hobby Schools Union (Eesti Huvikoolide Liit)

EKSL – Estonian School Sport Union (Eesti Koolispordi Liit)

EKKL – Estonian Art Schools Union (Eesti Kunstikoolide Liit)

EML – Estonian Music School Union (Eesti Muusikakoolide Liit)

ENK – Estonian Association of Youth Workers (Eesti Noorsootöötajate Kogu)

ENL – Estonian National Youth Council (Eesti Noorteühenduste Liit)

ESÜ – Estonian Scout Association (Eesti Skautide Ühing)

ETHL – Estonian Dance Hobby Education Union (Eesti Tantsuhuvihariduse Liit)

EVS – Estonian Debate Society (Eesti Väitlusselts)

EÕEL – Estonian School Student Councils' Union (Eesti Õpilasesinduste Liit)

EÜL – Federation of Estonian Student Unions (Eesti Üliõpilaskondade Liit)

HTM – Ministry of Education and Research

NPO – Non-profit organisation

NTS – Youth Work Act of Estonia

TE – Technical Efficiency

TEAHU – Estonian STEM Education Union (Eesti Teadushuvihariduse Liit)

TORE – Youth Association TORE (Noorteühing Tugiõpilaste Oma Ring Eestis)

VRS – Variable Returns to Scale

INTRODUCTION

The nature of economic activity in Estonia, as in many other countries, can be defined by 2 types: commercial (or for-profit activity) and non-commercial (or non-profit). For-profit activity implies to the presence of profit (or loss), which is distributed among shareholders and typically, this type of activity describes companies (Duska 1997). In the case of non-profit activities, a similar to for-profit activities concept of profit called “net surplus” (or “net deficit”) may arise, but it cannot be distributed among the members of the non-profit organisation (NPO) and can only be directed towards the future development of the organisation. This statement is also confirmed by § 1 subsections 1 and 2 of the Non-profit Associations Act of Estonia. The same act specifies that NPO are voluntary associations, the purpose of which is not to earn an income from economic activities (MTÜS § 1). In the context of this thesis, the words "organisation" and "association" are used interchangeably, although some may disagree with this wording[1].

The condition of non-distribution of profits deprives NPOs of the natural measurement of efficiency arising from the goals of such organisations, and significantly complicates the analysis of NPO efficiency (Borisova, Polishhuk 2009, 80). In addition, since NPOs typically do not operate in a competitive output market, measures such as net income or ratio analysis do not provide an indication of operational efficiency (Nunamaker 1985, 50).

For the author of this thesis, the topic related to methods of assessing the efficiency of NPOs is of particular interest, since there are difficulties in assessing their efficiency and comparing them with each other. Moreover, measuring performance in NPOs has received relatively little attention compared to assessing the efficiency of commercial organisations (Kim, Lee 2018, 166) and this is one of the first attempts to evaluate how efficient some Estonian NPOs are. Moreover, the author has worked for a similar organisation for several years. Given that the analysis of the entire NPOs’ sector of Estonia is a vast task, which requires tremendous amount of time and resources, the

[1] The author prefers to use the word “organisation” instead of “association”. Some officially established terms include the word “association” and therefore both words appear in the thesis.

author wants to focus on research and application of methods for assessing efficiency in the sector of youth work NPOs.

The aim of the study is to present various methods for assessing the efficiency of NPOs and, based on an output-oriented Data Envelopment Analysis (DEA) model, conduct a comparative analysis of several non-profit youth work organisations and find out which of those are more efficient in using resources. The result obtained can serve as an indicator for funders, showing whether it is worth financially supporting this organisation or for the organisations themselves as an opportunity to understand how efficiently they are working and, in which operational areas they should make changes. The analysis focuses on 16 organisations that meet two criterias: 1) they operate at the national level; 2) they are strategic partners of Estonian Ministry of Education and Research (HTM) and receive an annual grant from this institution. Both criterias automatically determine that the organisation is playing an important role for the field of youth work.

The main research questions for this study are:

1. What kind of difference do we see in terms of efficiency between NPOs that receive large funds and those that receive less?
2. How efficient are national-wide analysed non-profit youth work organisations in Estonia?

Based on the aim and the research questions, the following hypothesis was developed:

- Non-profit youth work organisations are mostly inefficiently using the resources to achieve their main goal of existence.

To analyze the efficiency levels, Data Envelopment Analysis (DEA) method is applied using data from annual financial reports of organisations of the year 2019, as well as from their official websites, Estonian database of articles Digitaalarhiiv (DIGAR) and other informational documents. On the basis of the results obtained, a conclusion is made about the efficiency. The thesis consists of 4 parts. In the first part, the concept of efficiency and methods of efficiency measurements are presented in more detail. The second part focuses on representing the sector of non-profit youth work organisations. In the third part, the author conducts the analysis and, in the forth part results are discussed and limitations of this study are exposed.

1. EFFICIENCY OVERVIEW AND MEASUREMENTS

In this chapter, the author provides a theoretical background of the concept of efficiency, explains the complexity of measuring the efficiency of NPO and presents several techniques for evaluating the performance.

1.1. Efficiency concept

The term "efficiency" comes from the Latin word *efficientia.* In the late 16th century, it meant "power to achieve something" (Harper 2018). Over time, this term has acquired several other meanings, but basically all concepts come down to defining the term as, achieving the expected output with minimal input or no waste of resources (Siimann 2018).

The term "efficiency" may, however, differ. Drucker (1963) in his article distinguishes between effectiveness and efficiency, where effectiveness means doing the right thing, and efficiency means doing things right. The author believes that it is very important to distinguish between efficiency and effectiveness terms, since confusion can often arise in the scientific literature. Palmer and Torgerson (1999) derive from the opposite term "inefficiency", which exists in case when available resources can be reallocated to achieve better results and consequently efficiency is used when resources are used in order to maximize outcomes. Sumanth (1994) uses the concept of the relationship between actual and expected results and, which should thus reflect how well resources are used to achieve a specific result. In general, it can be noted that the authors agree on one thing, that efficiency is the correct allocation or utilization of resources, which can be called as "inputs", in order to achieve the maximum possible result, which is in simple words "outputs".

There are several types of efficiency. Palmer and Torgerson (1999) emphasize technical efficiency, productive efficiency and allocative efficiency. Technical efficiency (TE) is the maximum possible improvement of outcome, which is achieved through the optimal choice of input resources. The concept of productive efficiency (PE) refers to maximizing outcomes using initial inputs or

minimizing costs for a particular outcome. Thus, this means that in a situation with several alternatives that give the same result, the alternative that requires the least cost is preferred. The last concept of allocative efficiency (AE) means that the allocation of resources is maximized for the well-being of a society or community.

Nevertheless, Farell (1957) emphasizes 2 types of efficiency in his work: technical and allocative (or "price") efficiency. Technical efficiency shows how the measured unit can produce outputs with given inputs or produce the required level of outputs using the minimum number of inputs. The first definition reflects the output-oriented model while the second definition, the input-oriented model. The allocative efficiency shows how technically efficient unit can use inputs in a volume that minimizes production costs given the prices of inputs. According to Farrell (1957), adding both measures of efficiency results in economic efficiency (EE) (or "overall efficiency" reffered in Farrell's article), the unit is efficient if both technically and allocatively efficient (Watkins *et al.* 2014).

The efficiency analysis that Farrell (1957) introduced is presented in Figure 1. The next two paragraphs are the summary of the basic principles of an original input-oriented scheme presented in the article by Murillo-Zamorano (2004).

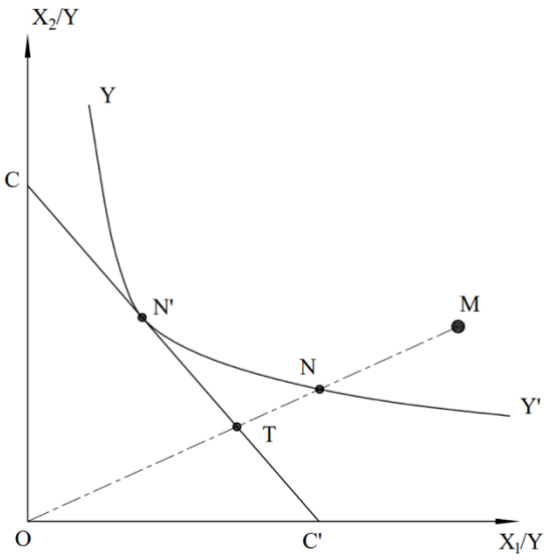

Figure 1. Technical and allocative efficiency measures
Source: Murillo-Zamorano 2004, 34

In his analysis, Farrell (1957) assumes that the technical set is identified by the isoquant called YY'. It minimizes the combined use of inputs, per unit of output. Any combination of inputs that lie on the isoquant is defined as technically efficient while those points to the right or above are not. The point M, for example, indicates that a firm needs a lot of inputs to generate a unit of output. Therefore, the distance NM on the line OM reflects the technical inefficiency, representing the amount by which all inputs can be divided without reducing the amount of output. On the graph, the level of technical inefficiency related to M can be presented as the NM/OM ratio and, therefore, the TE is expressed as 1-NM/OM and can be written as ON/OM (Murillo-Zamorano 2004, 34).

The allocative inefficiency can also identified on the isoquant plotted in Figure 1. The related distance in this case is given by the line segment TN, which is equivalent to the ratio TN/ON in relative terms. The above ratio indicates the cost savings that a studied object would be able to achieve if it switched from a technically but not allocatively efficient input package N to a both technically and allocatively efficient one N' for the least cost combination of inputs provided by point N'. As a result, the ratio OT/ON represents the AE of the studied element at point M (*ibid.*, 34).

The Economic Efficiency can be expressed as follows (*ibid*., 35):

$$EE = TE \cdot AE = \frac{ON}{OM} \cdot \frac{OT}{ON} = \frac{OT}{OM} \quad (1)$$

It is also worth noting that efficiency can be measured using constant returns to scale (CRS), variables returns to scale (VRS) and on the basis of an input-oriented analysis or output-oriented analysis.

In Siimann's (2018) opinion, when using inputs to create output, it is also important to take into account external factors, which, as a rule, do not depend on the management of a particular unit. Factors can be both supportive and limiting. Examples include a complex or favorable legal framework, political environment, the level of economic development, the average level of education of people, and others. The complete efficiency construct is presented in Figure 2 and reflects how the external environment affects the use of various tangible and intangible inputs to

create outputs and where economic efficiency reflects how well the resources are used to achieve the desired result.

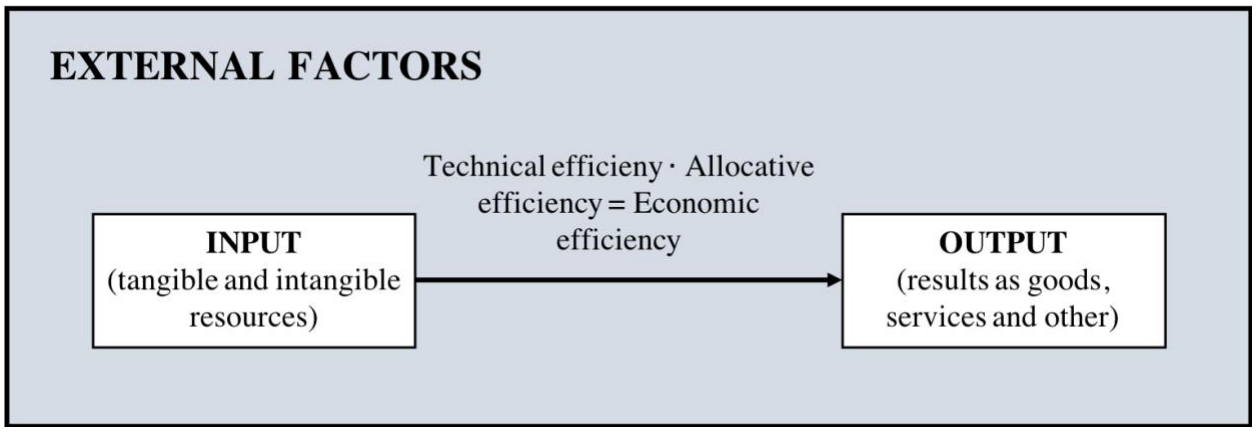

Figure 2. Efficiency construct
Source: Siimann (2018, 12)

1.2. Efficiency measurement techniques of non-profit organisations

To assess the performance of a non-profit organisation, it is possible to proceed from the efficiency and effectiveness point of view and use both financial and non-financial assessment tools. Epstein and McFarlan (2011) propose, for measuring both financial and non-financial performance, to group the activities of an organisation into five clusters: input, activity, output, results and impact.

Efficiency measurement can be done from an economic and benchmarking point of view. Economic evaluation techniques include cost minismisation analysis, cost-effectiveness analysis, cost-utility analysis and cost-benefit analysis. These metods are mostly used to measure allocative efficiency. To measure technical efficiency, benchmarking approaches such as simple ratio analysis, unit cost analysis, stochastic frontier analysis (SFA) and data envelopment analysis (DEA) are in use (Peacock 2001, 4-6). Each method has its own advantages and disadvantages. After analyzing all of the above methods, the author decided to more vividly present the method of financial ratios and DEA.

1.2.1. Efficiency measurement using financial ratios approach

Ritchie and Kolodinsky (2003) reviewed the performance assessment from a financial point of view using data from the Internal Revenue Service (IRS) Form 990 and interviewing the organisation's the most important informers. Form 990 is US IRS form that inform the public about

financial performance of NPO (About .... 2020). Based on these two sources, they managed to bring out such parameters as public support, fundraising efficiency and fiscal performance (Ritchie and Kolodinsky, 2003). Public support shows how dependent an organisation is on direct public support (Siciliano 1996, Lee 2010). Fundraising efficiency shows how much money support was earned for the organisation for each unit of currency spent (Greenlee and Bukovinsky, 1998). Fiscal performance shows how the organisation is financially managed in terms of total revenues to total expenses (Siciliano 1996, Lee 2010).

Based on the work of Lee (2010) and Sicialino (1996), the formulas of indicated parameters can be calculated as follows:

$$Fiscal\ performance = \frac{Total\ Revenue + Accumulated\ Reserves}{Total\ expenses} \quad (2)$$

$$Fundraising\ efficiency = \frac{Fundraising\ Expenses}{Total\ Contribution\ (gifts, grants, and\ other\ contribution)} \quad (3)$$

$$Public\ support = \frac{Total\ Contribution\ (gifts, grants, and\ other\ contribution)}{Total\ Revenue} \quad (4)$$

The difficulty in applying these formulas in Estonian realities lies in the correct interpretation of the variables. For this, it is necessary to proceed from the way in which NPOs operating in Estonia present their financial results in the annual financial reports. According to the § 34 subsection 4 of the Accounting Act (RPS), the minister responsible for the area shall establish the guideline of the Standards Board (ASBG) by a regulation (RPS § 34). Regulation of the Ministry of Finance on the "Establishment of the Guidelines of the Accounting Standards Board" Note 14 (ASBG 14) presents the requiered reporting entries in the main statements (Balance Sheet, Income Statement, Cash Flow Statement, Statement of Changes in Net Assets) (Regulation ... 2018). In the Income Statement entries description, the section of the Income includes (*ibid.*):

1. fees collected from members (both membership and intended for specific purpose);
2. donations and grants, which could be targeted or for specif purpose (usually for financing a specific project) and without a targeted focus;
3. net proceeds from financial instruments;
4. business income;
5. other (irregular) income.

Nevertheless, the main problem lies in figuring out which entries should be included in the total contribution. The author believes that, in this case, it is necessary to add up all member fees, grants and donations and not take into account business income and other income.

This is followed by expenses, which are of the following types (*ibid.*):

1. direct expenses of specific financed project;
2. allocated (or distributed) donations and grants (to other natural or legal persons);
3. other operating expenses;
4. labour expenses, which include employee wages and salaries and social security tax;
5. depreciation and impairment of non-current assets;
6. miscellaneous expenses

Adding up all these expenses, the total expenses entry associated with direct operating activity is obtained. Then, other costs/incomes are subtracted/added from/to this, and finally the net surplus or net deficit for financial year is obtained. The difficulty arises from to the fact that there is no separate column for fundraising expenses, therefore, in the case of each individual organisation, fundraising costs must be calculated differently. Typically they include labour, other operating and miscellaneous expenses. Sometimes labour costs associated with projects are shown separately in labour cost entry, so labour costs may sometimes be inadequately represented.

Another ratio is the so-called overhead ratio, information for which is taken from the IRS Form 990. This ratio can signal about the health of the organisation, but the use of this method is not always considered to be reasonable. Organisations can purposefully change some metrics in a way that makes it appear to stakeholders that the organisation is using resources effeciently (Coupet and Berett, 2019, 301-302, 308). The formula for calculating this ratio is presented below:

$$0verhead\ ratio = \frac{General\ and\ management\ expenses + fundraising\ expenses}{Total\ expenses} \quad (5)$$

Advantages of ratios analysis:

- They are quite easy to use and do not require any raw data changes. Information can be taken directly from the report forms;
- Allows to get a quick result that can be easily interpreted;
- May indicate good or poor outcome, but do not provide an explanation about causes;
- Allows to analyze different companies based on the same parameters.

Disadvantages of ratios analysis:

- The results are not sufficiently accurate, because the parameters specified in the report forms may be presented inadequately or incorrectly;
- Reporting forms are not standardized and some assessment parameters may be missing;
- They do not give a clear idea of the efficiency of particular unit but, in general, relevant comparison of the obtained results can be done;
- The methodology and formulas for measuring some ratios are not standardized.

1.2.2. Data Envelopment Analysis

The Data Envelopment Analysis (DEA) is a linear programming tool for determining the efficiency of various units (Data … 1997, 13). Each unit is evaluated in comparison to other units within the same structure. This method of evaluation was firstly introduced by Charnes *et al.* (1978) and the concept was originally based on relative efficiency, proposed by Farrell in 1957 (Nunamaker 1985, 51) and mainly used to assess technical efficiency (Data ... 1997, 13). The concept of DEA is based on the theory of Pareto[2] efficiency.

The DMU (Decision Making Unit) is a part of the DEA system and it designates the various categories of entities that will be assessed. Firms, governmental institutions, bank branches and also NPO are examples of DMUs. Every DMU has input and output parameters that are the main analysis instruments (Charnes *et al.* 1978, 1-3).

The DEA analysis supports two models: input-oriented (minimization of inputs) and output-oriented (maximization of output). The analysis can be performed using constant returns to scale (CRS) developed in 1978 by Charnes, Cooper and Rhodes (CCR) or variable returns to scale (VRS) suggested by Banker, Charnesand Cooper (BCC) in 1984 (Huguenin 2012, 52). The first model (CCR) suggests that a difference in cost amount results in a relative change in outcome. The second (BCC), more recent model suggests that the cost-dependence of outcomes can be declining or rising. It is proposed to discern the scale efficiency (SE) index, which is the ratio of the constant scale efficiency index to the variable scale efficiency index within the context of this method (Uri 2001, 172-173).

$$SE = \frac{CRS}{VRS} \tag{6}$$

[2] Pareto efficiency states that no indicators can be improved without degrading any other indicator (Kaldaru 2006, 171)

For this thesis, the BCC approach (based on VRS assumption) will be used. A more detailed explanation of why this particular model is used in this study is presented in Chapter 3.2.

To apply the BCC model, it is requiered to move away from the CRS assumption. In the primar equation, a calculation of return to scale for entity f is used (or the convexity constraint in the dual equations). A measure of return to scale for firm f is added in the primal equation (or the convexity constraint $\sum_{j=1}^{n} \lambda_j = 1$ in the dual equations) (*ibid.*, 52).

The VRS-solved linear programming problem requires a calculation of returns to scale on the variables axis, c_f, for the entity f (*ibid.*, 56).

VRS output-oriented model – primal equation

Minimize $\sum_{i=1}^{m} v_i x_{if} - c_f$ (7)

Subject to

$\sum_{i=1}^{m} v_i x_{ij} - \sum_{r=1}^{s} u_r y_{rj} - c_f \geq 0 \quad \text{and} \quad j = 1, \dots, n$

$\sum_{r=1}^{s} u_r y_{rf} = 1$

$u_r, v_i > 0$ and $\forall r = 1, \dots, s, i = 1, \dots, m$

where

y_{rf} is the amount of output r generated by entity f;

x_{if} is the amount of input i consumed by entity f;

u_r is the weight of output r;

v_i is the weight of input i;

s is the number of outputs;

m is the number of inputs.

It is regularly desirable to solve the calculation utilizing the envelopment structure since it contains just $s + m$ requirements instead of $n + 1$ limitations in the multiplier structure. The dual linear programming model is presented below (*ibid.*, 50, 56).

VRS output-oriented model Dual equation

Maximize ϕ_f (8)

Subject to

$\phi_f y_{rf} - \sum_{j=1}^{n} \lambda_j y_{rj} \leq 0$ where $r = 1, \ldots, s$

$x_{if} - \sum_{j=1}^{n} \lambda_j x_{ij} \geq 0$ where $i = 1, \ldots, m$

$\sum_{j=1}^{n} \lambda_j = 1$

$\lambda_j \geq 0$ and $\forall j = 1, \ldots, n$

Where

$\frac{1}{\phi_f}$ and θ_f shows the technical efficiency of entity f

λ_j shows the associated weighting of outputs and inputs of entity j

A graphical representation of the BCC output-oriented model is shown on Figure 3. Units A, B, C, D, and E are on the curve and are efficient, points F and G represent inefficient DMUs and, the distance between the current position and the desired on the curve in order to become efficient.

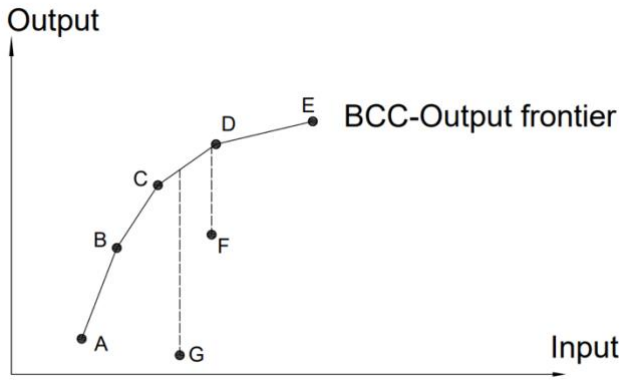

Figure 3. Envelopment projection of BCC-output frontier
Source: Sowlati (2001, 51)

Advantages of DEA (Data ... 1997, 21-22):

- DEA can address various inputs and outputs;
- It does not demand concrete type of inputs to outputs;
- It can be extended and used to both for-profit and non-profit organisations;
- It assigns goals to inefficient DMUs in order to make them efficient;
- It also detects slacks in inputs and outputs;
- It calculates a single efficiency score, determines input and output slacks, and offers metrics to track the success of inefficient units.

Disadvantages of DEA (Data ... 1997, 22-23):

- It is a non-parametric methodology and checking the mathematical hypothesis is complicated;
- DEA produces results that will contain measurement errors;
- The calculated efficiency is very subjective, because the comparisons is completed using the same set of DMUs;
- It is affected by the input-output variables used and the number of units examined. The size of sample affects the results. When the sample size is very small, the model's discretionary control is reduced;
- The calculations carried out in the framework of DEA analysis are very voluminous, however, the available software made it possible to simplify the process of obtaining efficiency results.

There are several factors to consider when performing a DEA analysis (Sarkis 2007):

1. The investigated DMUs must belong to the same field of activity and the data selected for research must be accurate;
2. For the results obtained to be reliable, the sample size must be no less than specified by the rule of thumb;
3. The choice of input and output variables is the most important task in DEA models. Regression analysis can be used to find the most optimal variables. Values equal to zero, negative, or missing should not be considered. The number of variables should be as small as possible;
4. Data must be scaled before using DEA to ensure that input or output variables would not have overly large values;
5. Post-DEA analysis can be performed to analyze how the environment or context affects the efficiency score.

1.3. Efficiency measurement problems of non-proft organisatsions

Forbes (1998) notes that assessing the performance of non-profits is particularly challenging because there are several factors that make it difficult to do the analysis. First of all, their special legal and financial status makes it difficult to use the most common indicators for assessing commercial efficiency. Most often, these are the profitability or stock market indicators. Secondly, as noted by Newman and Wallender (1978), even developing artificial quantitative indicators of

performance makes it difficult to measure, because NPO often have vague goals of existence and the range of services they offer is intangible. Third, Kanter and Summers (1987) note that the work of NPO is often based on social values that are not agreed upon.

Another problem that Kim and Lee (2018) underline is that NPOs are focused on a specific mission and this mission itself is very abstract and often the focus of the organisation is aimed at solving a social problem and providing services to society. The difficulty is that it is not clear how to correctly assess how well an organisation achieves it. Anderson (2005) also draws the attention to the problem of the theory of change, which reflects the causal relationship between the program of action and the intended results. Kim *et al.* (2017) adds that many stakeholders regularly influence causal relationships that are not considered by the theory of change, but their activities affect the outcome of achieving the goals of the existence of NPOs. Due to the fact that the theory of change is complex and there are often a lot of stakeholders, it becomes problematic to assess the results of the activities of NPOs. In addition, some NPO leaders believe that the efficient use of resources is not as important as effectiveness, which shows how well the organisation's mission has been achieved. Lastly, the problem is that the effeciency of NPO has not yet been studied as closely as the efficiency of for-profit organisations (Kim, Lee 2018, 166).

2. NON-PROFIT YOUTH WORK ORGANISATIONS

In this chapter, the author focuses on the legal framework and characteristics of youth work non-profit organisations. First, a general idea of the non-profit type of activity and youth work organisations is given, then the author explains in more detail which organisations are the objects of this study and why the choice was made in their favor.

2.1. Legal framework of non-profit youth work organisations in Estonia

Since this thesis is focused on non-profit youth organisations, the author wants to enlighten readers why the youth work sector is important in Estonia and, on the basis of which criterias the organisations for this study were chosen.

The subject of youth work in Estonia is a young person and § 3 clause 1 of the Youth Work Act defines that a young person is a natural person between 7 and 26 years of age (NTS § 3). As of 2019, there were 275,879 young people living in Estonia, which is 21% of the total population of Estonia (Noortevaldkonna ... 2020, 4). As can be seen from the statistics, this is one fifth of the population, and since young people are considered to be a vulnerable group, the state creates many forms of supporting for them. The aim of youth work in Estonia is to introduce the values of participation and democracy, to prevent social exclusion and marginalization (Bonn 2007, 22). Youth work has an important role to play in creating better conditions for young people to unleash their potential and make decisions about their lives, and to support their active participation in society and their ability to cope in the labour market. Youth work is one of the ways in which young people's participation in society can be supported, thus reducing, among other things, their risk of exclusion (Espenberg *et al.* 2018, 6).

One of the important determinants of youth work is the agents who directly or indirectly interact with youth. For these agents, the Youth Work Act has several definitions. The word "agent" in this

chapter refers to organisations and various institutions. In the same law in § 3, definitions of various youth associations and agencies are presented (NTS § 3):

- A youth work agency is a state agency administered by a ministry, a rural municipality or city administrative agency or an institution administered by a rural municipality or city administrative agency, a legal person in private law, or an undertaking of a legal person in private law the main activity of which is the organisation of youth work. Such an agency is, for example, the Youth and Education Board;
- A youth work association is a non-profit association, an union of non-profit associations or a foundation the objective of which is the integration of youth workers, youth work agencies or other exercisers and organisers of youth work and representation of their interests. A good example of such an organisation is The Estonian Association of Youth Workers;
- A youth association is a non-profit association at least two thirds of the members of which are young people and the objective of which is the organisation and performance of youth work. A good example of this type of organisatsion is Estonian Scout Association;
- A union of youth associations is a non-profit association the members of which are youth associations There are few such organisations in Estonia, and one of the most famous of them is Estonian National Youth Council.

In addition to this list, there is also such a concept as a youth council, which in the context of this study cannot be considered, since these organisations operate under the rural or city council supervision (NTS § 3 and § 9).

The main task of youth organisations or associations is to organize and conduct youth work. Thanks to such organisations, young people have the opportunity to supplement the knowledge gained at school or at home in an non-formal environment or learn something new for themselves, acquire new skills (Liimets *et. al* 2013, 235). In addition, organisations offer self-development opportunities for youth. Umbrella organisations (or referred as union of youth associations), in turn, bring together youth organisations to represent the interests of a large audience of young people at different levels and to offer to the experts and leaders of the organisation, as well as sometimes members, opportunities for individual development, which can then be applied in youth work. Youth work associations also have a crucial role to play as they act as a unified organisation

for youth work experts and professionals is legally representing their interests at national and international level and can even be consideres as a labour union for these professionals.

In total, in 2019, over 81,000 young people took part in hobby activities in Estonia, 146,000 young people studied in 780 hobby schools, 281 youth centers offered activities for 80,000 young people, in 18 nationwide youth organisations 12,200 members, and another 56 organisations unite more than 25,000 young people (Noortevaldkonna ... 2020, 6). This statistics emphasizes the value of youth work and the importance of accurately assessing the performance of such a significant field, because both organisations and donors will have a better understanding of the status of the area of operation using efficiency analysis and will be able to take some additional measures to improve the performance.

2.1.1. Selection of the organisations for the study

When choosing youth work organisations for this study, the author proceeded from two principles: 1) the organisation should operate at the national level and 2) it should be a strategic partner of the Ministry of Education and Research (HTM) and receive an annual monetary grant from the ministry. Both conditions should emphasize that such organisations are of national importance and are reliable and proven partners. In addition, it also allows for a more accurate and detailed analysis, since the selected organisations have been active for a long enough time.

As of 1 January 2019, the Gambling Tax Act and Cultural Endowment of Estonia Act was amended and the Council of the Gambling Tax disappeared, which also supported projects in the fields of interest of the HTM (Hasartmängumaksu … 2019). Starting from the same year, the ministry switched to a new system of financing strategic partners (Strateegiliste … 2019).

Strategic partner is (*ibid.*):

- An organisation that has been active for at least 3 years (or less in justified cases) and contributes to the development of policy, development of legislation and strategies in the fields of interest (education, research, youth and language) of the HTM, including participation in steering group committees or
- An umbrella organisation that brings together organisations in one of the HTM areas of interest and contributes to the implementation of the strategic objectives of the area or

- An organisation dedicated to the implementation of strategic goals in the fields of education, research, youth and language.

According to Note 1 to the Education and Science Minister's Directive No. 1.1 2/19/59 of 04 March 2019, 70 organisations became strategic partners of the ministry (Haridus ... 2019). Of this number, only 17 organisations can be considered as organisations that are engaged in youth work and their full list is presented in the Estonia's Youth Field Development Plan 2021-2035 (Noortevaldkonna … 2020, 30). Due to the fact that one of the organisations did not submit its financial report for 2019 to the register by the specified date and the author does not have a possibility to retrieve it or receive from other sources, the study will focus on the following 16 organisations the detailed description of which is presented in Appendix 1 (*ibid.*):

1. Association of Estonian Open Youth Centers (ANK) or "Eesti Avatud Noortekeskuste Ühendus" in Estonian;
2. Estonian Art Schools Union (EKKL) or "Eesti Kunstikoolide Liit" in Estonian;
3. Estonian Association of Youth Workers (ENK) or "Eesti Noorsootöötajate Kogu" in Estonian;
4. Estonian Dance Hobby Education Union (ETHL) or "Eesti Tantsuhuvihariduse Liit" in Estonian;
5. Estonian Debate Society (EVS) or "Eesti Väitlusselts" in Estonian;
6. Estonian Guides Association (EGL) or "Eesti Gaidide Liit" in Estonian;
7. Estonian Hobby Schools Union or (EHKL) or "Eesti Huvikoolide Liit" in Estonian;
8. Estonian Music School Union (EML) or "Eesti Muusikakoolide Liit" in Estonian;
9. Estonian National Youth Council (ENL) or "Eesti Noorteühenduste Liit" in Estonian;
10. Estonian STEM Education Union (TEAHU) or "Eesti Teadushuvihariduse Liit" in Estonian;
11. Estonian School Sport Union (EKSL) or "Eesti Koolispordi Liit" in Estonian;
12. Estonian School Student Councils' Union (EÕEL) or "Eesti Õpilasesinduste Liit" in Estonian;
13. Estonian Scout Association (ESÜ) or "Eesti Skautide Ühing" in Estonian;
14. Federation of Estonian Student Unions (EÜL) or "Eesti Üliõpilaskondade Liit" in Estonian;
15. Youth Association Estonia 4H (4H) or "Noorteühing 4H" in Estonian;

16. Youth Association TORE (TORE) or “Noorteühing Tugiõpilaste Oma Ring Eestis” in Estonian.

As already mentioned above, the organisation called Youth Association ELO (ELO) or “Noorteühendus ELO” in Estonian is not considered in this study, since the author does not have data for conducting an appropriate comparative analysis.

Given the fact that the data required for the analysis were available only for 2019, the author restricts the analysis only on this particular period of time. More details on the choice of parameters for research and explanation are presented in the third chapter.

3. DATA ENVELOPMENT ANALYSIS (DEA)

In this chapter, the author will justify the choice of the analysis model, explain which inputs and outputs were selected and will carry out the analysis. Then, the obtained results will be interpreted.

3.1. Main assumptions about the analysis

To conduct a DEA analysis, several conditions must first be met. There is a rule of thumb that the number of selected DMUs should be three times larger than the sum of the number of inputs and outputs (Bowlin 1998). Golany and Roll (1989) believe that the number of DMUs should be twice the sum of inputs and outputs and Dyson *et. al* (2001) finds that number of DMUs should be twice the production of outputs and inputs. As it was indicated earlier, 16 organisations are analyzed in this study, therefore, based on the rule of thumb, there can be the following combinations of inputs and outputs: 2 inputs and 2 outputs, 2 inputs or outputs and 3 inputs or outputs and other combinations, if the results of addition or multiplications do not exceed 16. For this study, the author chose 2 inputs and 3 outputs and explains his choice in more detail in the next subchapter.

The DEA model used in this study does not allow to conduct an analysis if the value of any input or output is negative or equal to zero. This is called the DEA's "positivity" requirement (Sarkis 2007, 310). That is why, in this study, the values of inputs and outputs are strictly positive.

The 16 selected organisations meet two conditions: each of which operates at the national level and receives an annual grant from the HTM. The year 2019 was taken as the base year for this study because this is the earliest year data for which, at the time of the study, is available to the author. In addition, in year 2019 a new system of financing strategic partners was introduced and therefore, comparisons with previous years may be irrelevant. The data taken for this study from the financial reports of organisations are presented in Appendix 2. In addition to this, the author notes that even if data for 2020 were available, then given the coronavirus crisis that erupted early

last year, some indicators would be inadequately reflected (since for a long time the work of many organisations was disrupted and the provision of services was interrupted).

3.2. Choice of inputs, outputs and model

The results obtained during the DEA analysis should be comparable with each other, therefore, the selection of the inputs and outputs that will be used throughout the analysis is a crucial task.

There are three basic ways to select inputs and outputs:

- Consider previous similar studies on the same topic and select the same variables;
- Discuss with experts which set of inputs and outputs is most suitable;
- Combine both options and select previously used inputs and choose one own, taking into account the specifics of organisations.

In a study of Turkish Non-Governmental Organisations, Özbek (2015) used "total revenues" and "total expenses" as inputs, and as outputs "total expense for goals and services" and "surplus income". The author draws attention to the fact that using the "total income" as an input is only possible when the organisations, in general, have a similar income in absolute numbers and a similar budget structure. In this case, organisations have different incomes ranging from tens of thousands to millions. In addition, in terms of structure, the revenues of organisations are very different: some have very high donation levels, others finance their core activities through member fees, targeted project funding or business income. Consequently, the use of "total expenses" will not give the desired result either. Outputs such as "total expense for goals and services" and "surplus income" cannot be considered in this study, since the reporting form does not allow to accurately determine the indicated expenses, and surplus itself is not always reflected correctly, since organisations may mistakenly indicate in the reporting the unused money during the financial year for targeted projects or annual grant as surplus. However, it is their liability because the financier may request them back.

Kim and Lee (2018), in a study of humanitarian assistance organisations in South Korea, took the number of employees, labour costs, the sum of all donations, grants and gifts, and management and fundraising expense as inputs. "The purposed program expenditure" and the number of beneficiaries were taken as outputs. The author of study presented in this thesis believes that the

number of employees is a good indicator that can be taken as a one input in this study, since the main resource of youth work organisations is their employees, specialists and experts. Youth work is mainly done personally and without human participation, the organisation will not be able to provide its services. Labour costs are also an adequate measure of assessment, since the quality of the services provided depends on it. However, in order to apply this parameter, it must be slightly modified and take into account also other operational costs that are inevitable for each employee. This category includes expenses for office, telephone, travel and so on. Without these expenses, the provision of services would be difficult. In addition, since organisations have different budgets in absolute terms, the author believes that labour and other operating expenses can be expressed as a percentage of total income, excluding grants and donations, which the organisation is obliged to distribute to its members or third parties.

Fundraising expenses, in this particular case, are very difficult to calculate and the complexities of this approach have already been mentioned earlier. The reporting form does not make it possible to present these costs and organisations themselves often do not keep separate records of these expenses. In addition, it is not simple to accurately calculate the proportion of how much labour costs were spent on raising finance and how much on maintaining service delivery. The number of final beneficiaries can theoretically be calculated, but there are several difficulties that must first be overcome in order to use this parameter. First of all, there is a need to find out the degree of involvement such as the number of active and passive beneficiaries. The first are those who take part in the activity, use the services. The latter are those aware of the activities of the organisation and occasionally can use the services. Second, in organisations where the members are legal persons, it is necessary to find out how many members from these organisations have benefited from the studied organisations. To collect this kind of data, there is a need to complete a separate research. Thus, the size of the final group of beneficiaries can be difficult to measure, and considering the members of organisations is not always the right approach, because members can be both legal and natural persons.

In a study by Barahona *et al.* (2009), the number of employees hired, the number of years of operation, and the amount of income were used as inputs. There was only one output i.e.the total number of projects both which have received funding and implemented, as well as those which are under preparation and waiting for funding decision. As mentioned above, the number of employees is a very good indicator of the resource measurements and is also used in the analysis of this thesis. However, the number of years in operation is not a good indicator, as it does not correlate with the

funding received from ministry (see the Appendix 3 for reference). The volume of income in absolute terms is different for each organisation and therefore, this indicator cannot adequately measure performance. According to the author of this study, the number of projects is a fairly good output to measure, but since projects have different durations, audience size, and funding, this indicator can be slightly modified and combined with the indicator of final beneficiaries in Kim's and Lee's (2018) study.

The author believes that it possible to measure the volume of an organisation's influence using the number of publications in the Estonian print media and internet portals where the name of the organisation is mentioned. This shows how actively the organisation works with the audience, how often events and projects are organized, since, as a rule, there is a press release before an important event, and after that usually organisations write an article about the achieved results. In addition, the number of publications also reflects the degree of importance of the main activity of the organisation, since if the object of informing the public is not an event or program that is important for society, then the print media do not mention this. The level of audience engagement in social networks is not relevant in this case, since in this case the organisation independently decides what, in their opinion, is important for society topic, project or event and can do targeted advertising.

The Estonian portal DIGAR was used to obtain information on the number of articles and mentions in the media for the period from January 1, 2019 to December 31, 2019. The portal allows users to search for articles which contains the text entered in the address bar. All articles in this database are digitized (DIGAR … 2021). For an accurate search, the author enclosed the unchangeable part of the organisation's name in brackets ("..."), then added the "AND" operator (without brackets) and finally added some letters to the last word excluding the ending which was substituted with "*" sign. For example, in order to find information on the request of the Estonian National Youth Council (Eesti Noorteühenduste Liit), there is a need to enter the request in the following format: "Eesti Noorteühenduste" AND Lii*. The resulting links were then checked for valid information and then entered into a summary table 2 as outp_3 parameter.

As another input, in addition to the average number of employees, the author believes that the percentage of labour and other operating expenses out of the total income, excluding donations and grants distributed to third parties or member orgnisations, can be used. This reflects how much of each euro of financing raised is used to pay labour and operating costs such as renting premises,

mobile phone expenses, travel and so on. The less this indicator is, the more direct expenses are spent on implementing projects and direct targeted activities.

As another output, the percentage of fees received from members, donations and grants excluding the annual grant from HTM and business income out of total income without donations and grants to be distributed to third parties or member orgnisations. This indicator reflects how much the organisation's budget depends on funding from the ministry. The higher this indicator, the more other funding makes up of total income. That is, these organisations have a higher level to continue their existence, if at one point the funding from the ministry stops. If the indicator is very low, then the organisation should think about how to find additional sources of funding for its activities.

The third output shows how much business income is in the total income. The development of entrepreneurial activity is very important for the sustainability of the organisation, since it reflects how well the organisation will be able to exist if the operating grant from the ministry and project financing cease to flow and the organisation will have to carry out its activities using independently earned funds. The higher the number, the better.

Based on the abovementioned information, the author has chosen the following input and output parameters, the values of which are presented in Table 1.

Inputs:

- average number of employees (referred as inp_1);
- % of labour and other operating expenses out of total income wihout donations and grants distributed to third parties or member orgnisations (referred as inp_2)

Outputs:

- % of fees received from members, business income, donations and grants excluding the annual grant from HTM out of total income without donations and grants to be distributed to third parties or member orgnisations (referred as outp_1)
- % of business income out of total income without donations and grants to be distributed to third parties or member orgnisations (referred as outp_2)
- number of exact mentions in print media and on nationwide internet portals for a given year (referred as outp_3)

These values for inputs and outputs were calculated based on the information provided in Appendix 2 and using the following formulas:

$$inp_2 = \frac{Labour\ and\ other\ operating\ expenses}{Total\ income - donations\ and\ grants\ distrubuted} \cdot 100 \quad (9)$$

$$outp_1 = \frac{Fees\ received + don.and\ grants\ without\ used\ annual\ grant\ from\ HTM, and\ distributed\ don.and\ grants + business\ income}{Total\ income - donations\ and\ grants\ distrubuted} \cdot 100 \quad (10)$$

$$outp_2 = \frac{Business\ income}{Total\ income - donations\ and\ grants\ distrubuted} \cdot 100 \quad (11)$$

Table 1. Input and output values

№	Name of the organisation	Inputs		Outputs		
		inp_1	inp_2	outp_1	outp_2	outp_3
1	ANK	8	25.25%	91.55%	0.15%	55
2	EKKL	2	24.85%	16.56%	15.38%	36
3	ENK	3	43.09%	41.02%	28.43%	19
4	ETHL	6	84.88%	6.34%	2.36%	4
5	EVS	3	29.09%	42.84%	1.70%	12
6	EGL	1	21.26%	24.60%	1.13%	10
7	EHKL	1	99.54%	11.25%	8.81%	1
8	EML	4	38.28%	76.56%	2.94%	70
9	ENL	9	58.45%	50.55%	2.19%	90
10	TEAHU	2	99.80%	19.93%	2.13%	8
11	EKSL	5	21.69%	36.54%	0.00%	111
12	EÕEL	2	29.41%	43.80%	2.74%	53
13	ESÜ	4	33.25%	45.46%	1.95%	29
14	EÜL	5	43.52%	84.46%	81.38%	31
15	4H	2	56.43%	16.62%	0.20%	22
16	TORE	2	33.40%	9.09%	8.85%	6

Source: Author's calculations based on data from Appendix 2

The VRS output-oriented model was chosen for this study, for two reasons. Since the first input is the average number of employees and in some organisations the number of employees is low (one or two employees), then if these DMUs turn out to be inefficient, it may turn out that they will have cease their activities due to lack of employees. The second input includes labour and other operating expenses. Due to the fact that in the area where these organisations operate, the level of salaries, according to the data of the Statistics Estonia in 2019, was between 1,000 and 1,200 euros, which is significantly lower than the average for all areas for the same period (1,407 euros per

month). In the case of an inefficient DMU, it may be necessary to reduce these costs, which is not possible because, consequently, it will be not easy to recruit skilled workers for a lower salary (Statistics Estonia, table PA001). Based on this, an output-oriented method was chosen and it means that, in this case, outputs are maximized at a set level of inputs. The BCC model (with VRS assumption) was preferable to the CCR model (with CRS assumption) because when the inputs are increased, the outputs may not grow in the same proportion.

3.3. Conduction of DEA analysis

There are many possibilities for DEA analysis, but the author chose to use the Data Envelopment Analysis (Computer) Program (DEAP), which was created by Tim Coelli (Coelli 1996). There is also python-based software, various solvers and macros for Excel (Paradi et al. 2018, 357).

Since this is a DOS program, two .txt files are required to use the program. The first file, which has the name EG1-dta.txt, records the data of outputs and inputs in matrix format. There are three rows of outputs and two rows of inputs. Only numbers are entered into files, no other text is allowed. Data for each organisation is entered under each other. Instructions are entered into the second file, which is named Eg1-ins.txt and presented in Appendix 4 (Coelli 1996). The first line specifies the file where the data is taken from (EG1-dta.txt), then below the file where the results will be entered (eg1-out.txt). Then, number of studied DMUs and the number of periods are entered. For this thesis, there are 16 organisations and one period, year 2019. The analysis includes 3 outputs and 2 inputs and an output-oriented 1-stage VRS analysis should be performed.

In this case, the author uses the one-stage DEA method. Multi-stage or two-stage is used when the parameters of inputs and outputs change over a certain period of time. Cost-DEA requires the indication of weight or price of inputs, and Malmquist is used when the same inputs and outputs for the same DMU have been researched for several years (Coelli 1996).

The final results obtained are presented in the next chapter.

3.4. Results of DEA analysis and their interpretation

The results of the analysis, presented in Table 2 and taken from Appendix 5, show that only 8 out of 16 organisations are efficient and their performance indicator is 1 (marked with rank number 1 and green color). The lowest performance indicator was recorded for ETHL (0.076). VRS analysis also shows whether there are diminishing returns to scales (DRS), which means than if a change in values of inputs is occurred, the output decreases less than proportionally to the rise in inputs, or increasing returns to scales (IRS), which indicates than if an increase in inputs in indicated, the output increases in a greater proportion. IRS is present at EVS, EHKL, ESÜ and TORE and DRS at ENK, ETHL, ENL and TEAHU. The average VRS efficiency is 0.782.

Table 2. VRS efficiency score and rank in output-oriented DEA analysis

Rank	Name of the organisation	Efficiency score	IRS or DRS
1	ANK	1.000	-
1	EKKL	1.000	-
1	EGL	1.000	-
1	EHKL	1.000	IRS
1	EML	1.000	-
1	EKSL	1.000	-
1	EÕEL	1.000	-
1	EÜL	1.000	-
2	ENL	0.958	DRS
3	EVS	0.795	IRS
4	ENK	0.743	DRS
5	ESÜ	0.660	IRS
6	TEAHU	0.460	DRS
7	4H	0.415	-
8	TORE	0.407	IRS
9	ETHL	0.076	DRS
	Mean	0.782	

Source: Appendix 5

This is followed by information about peers, which shows for each DMU which other DMUs were used to determine its efficiency. For the purposes of the DEA, efficient DMUs are the basis for evaluating other DMUs and thus, as a kind of peer for them. Thus, for efficient DMUs, the only peer is the DMU itself. The most commonly used peer was EÜL, which was used as 7 inefficient DMU peer. The least used peers were ENK, ETHL, EVS, ENL, TEAHU, ESÜ, 4H and TORE, which were not used as any other DMU peers. In the case of peers, their sequence is also important,

and the first mostly used peer was EÜL (4 times) and EML (3 times). In addition, for peers, their weights are also important and summary of peers and their weights is presented in Table 3.

Table 3. Peers and their weights

Organisations	Peers and their weights			
ANK	ANK (1.000)			
EKKL	EKKL (1.000)			
ENK	EÜL (0.460)	EÕEL (0.162)	EGL (0.379)	
ETHL	ANK (0.232)	EÜL (0.364)	EML (0.404)	
EVS	EML (0.432)	ANK (0.098)	EGL (0.466)	EÜL (0.004)
EGL	EGL (1.000)			
EHKL	EHKL (1.000)			
EML	EML (1.000)			
ENL	EKSL (0.597)	EÜL (0.014)	EML (0.389)	
TEAHU	EÜL (0.026)	EÕEL (0.897)	EGL (0.077)	
EKSL	EKSL (1.000)			
EÕEL	EÕEL (1.000)			
ESÜ	EML (0.659)	EÜL (0.010)	ANK (0.141)	EGL (0.191)
EÜL	EÜL (1.000)			
4H	EÕEL (1.000)			
TORE	EÜL (0.247)	EKKL (0.013)	EHKL (0.084)	EGL (0.656)

Source: Appendix 5

The DEAP output file also contains information about the so-called targets, which show the values of the inputs and outputs for each DMU that would need to be achieved for efficiency.

For example, ENK should increase the proportion of income excluding HTM grant to more than 55% of total income in order to be less dependent on funding from the ministry, the share of business income should be increased from 28.43% to 38.30% and, at least 8 additional publications per year must be published. For the most inefficient organisation ETHL, the level of other income should be at least 82.90% out of all income (instead of 6.34%, which is now), and business income should be more than 30% out of all income (instead of 2.36%). The number of publications in the media should be more than 13 times greater. EVS should also pay attention to the proportion of its income without a grant and it should be almost 54% in the budget, but business income should only be slightly increased to 2.1%. There should be approximately 3.4 times more publications in the media. For ENL, everything is pretty good, despite the fact that the grant from the ministry accounts for almost 50% of all income. This organisation only needs to increase other revenues by 2%, and business income can remain at almost the same level. The number of publications should

only increase by 4.4%. TEAHU should also revise its income lines, as now 80% of their annual income comes from a grant from the ministry, and to be efficient, the grant should not be no more than 56% of revenue. Business income should be doubled, although now it is just over 2%. The number of publications in the media should be more than 6 times greater. For ESÜ, the volume of other income should be increased by 50% compared to the current figure and reach a level of almost 69%. Business income should be at least 3% instead of 2%, and the number of publications should be doubled to 56. 4H's income, excluding the grant, now accounts for just over 16.6% of all income, but should be at 43.8%, business income at 2.7% and publications in the media should be 53 instead of 22. TORE should quadruple the proportion of income without accounting for HTM grant up to 38% and 2.46 times increase the proportion of business income out of total income and produce at least 15 publications in the media per year (instead of 6).

Based on the above analysis result, it is possible to answer the research questions. First of all, relying on the data from Appendix 3, namely the correlation coefficient, which is almost equal to 0, the funding allocated by the ministry does not, in any way, depend on the results of the technical efficiency of organisations. This means that the efficiency of the organisation is not directly related to the receipt of funding from the ministry and its volume. Other factors affect overall performance. In addition, it was possible to find out that only half of the national-wide organisations are efficient, the rest are no less efficient in comparison with others, and there are quite inefficient ones, which are more than two times inefficient than the most efficient organisations. From this statement, it is possible to conclude that the hypothesis is partially confirmed, since exactly half of the organisations are inefficient.

4. RESULTS AND LIMITATIONS OF THIS STUDY

Based on the results of the study, it turned out that only half of the studied organisations are efficient and their efficiency score is in no way related to the funding received. Actually, the Youth Field Development Plan 2021-2035 draws attention to the fact that the provision of youth work services should be cost-effective, which is directly related to the funding allocated by the ministry, since taxpayers' money is used (Noortevaldkonna … 2020, 21). At the moment, for the author this is not clear on which factors the ministry determines the specific amount one or another organisation will receive. It is very important to develop an appropriate mechanism that will allow more justified decision-making on funding. One of the possible performance analysis methods could be DEA which is presented in this paper or another similar method can be used (order-m, for example).

Nevertheless, the author draws attention to the fact that the analysis carried out in this thesis does not claim to be the most correct approach, since there are several aspects that affect the results obtained. Firstly, for a better analysis it is required to use several methods, since one method cannot correctly reflect the real situation in the field of youth work organisations. It is possible to combine several methods and then compare the results obtained, and in this case, the conclusion about the efficiency will be more accurate. Secondly, in this study, only technical efficiency was measured and allocative efficiency was not the focus of the study, therefore, to obtain a more accurate picture of the overall efficiency results, additional analyzes should be carried out. Thirdly, the data used in this study may contain inaccuracies and errors. For example, the author noted that organisations report unused funding for specif purpose differently in their reports. Some organisations believe that if not all allocated funds have been used, then this can be reflected as surplus, but this is actually a liability, since the financier may demand these funds back until the final financial report about used funds is confirmed. In addition, when receiving data on mentions in the media, articles written on Internet portals or releases made in little-known media portals and social networks were not taken into account. In addition to this, it is worth considering that some organisations may prove to be more efficient due to the fact that the number of officially registered employees is very low, but the organisation uses the help of volunteers, which in the end may not be as efficient and

effective as it seems. In addition, the non-profit organisations have many tax-exemptions and incentives and the organisation can reward its employees in other ways than just salary.

Fourth, the data in this study is based on year 2019 and may no longer be relevant, as organisations may have become more efficient in 2020. However, the author draws attention to the fact that since the coronavirus pandemic began in the first half of 2020, the provision of youth work services has been disrupted and therefore the performance results based on data from 2020 may be worse than in 2019. For future similar studies, the data for 2020 and 2021 must be interpreted very carefully, as they may not reflect the real situation in the sector under normal conditions (without official restrictions imposed by state).

Fifth, for better presentation of results, it would be useful to track the performance trend for each organisation over a certain period of time, rather than based on the results of one year. This will allow us to draw better conclusions about the efficiency, since, perhaps, the organisation is in the process of development and their efficiency results from year to year are getting better and better, but currently this trend cannot be traced.

CONCLUSION

The theory of assessing the efficiency of enterprises began to form at the beginning of the 20th century, but only in the middle and second half of the last century, scientists managed to create clearer and more detailed models and methods, as well as structure various methods. While research on evaluating the performance of the commercial sector is not unique, the non-profit sector does not receive as much research attention.

The purpose of this thesis was to present some methods for evaluating non-profit organisations, and use DEA approach for evaluating the efficiency of 16 youth work non-profit organisations that operate at the national level and receive funding from the Estonian Ministry of Education and Research.

The main research questions for this study were:

1. What kind of difference do we see in terms of efficiency between NPOs that receive large funds and those that receive less?
2. How efficient are national-wide analysed non-profit youth work organisations in Estonia?

And also a hypothesis that non-profit youth work organisations are mostly ineffeciently using the resources allocated to them to achieve their main goal of existence was put forward.

The study employed the output oriented BCC model (which implies VRS) DEA analysis with 2 inputs and 3 outputs. The data for the analysis were taken from the annual financial reports of organisations for 2019 and the Estonian database of articles DIGAR. Based on these data and the formulas derived by the author, the results of the analysis were obtained, which revealed that the efficinecy score does not play any role in terms of the amount of the received grant from the HTM and 8 out 16 studied non-profit youth work organisations are inefficient which partly confirms the hypothesis about inefficient use of resource.

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APPENDICES

Appendix 1. Type, description of studied organisation and funding received for 2019

Name of the organisation	Type (according to NTS § 3)	Description	Years in operation	Total Grant Received in 2019 (in euros)
ANK	youth work association	a nationwide umbrella organisation that unites 219 youth centers and 76 members all over Estonia and represents their interests	19	78,000
EKKL	youth work association	a non-profit organisation that unites 25 schools offering hobby education in the field of art and represents their interests	18	83,000
ENK	youth work association	a non-profit organisation that brings together more than 150 youth workers of different levels and represents their interests	21	67,000
ETHL	youth work association	a non-profit association that represents and supports 52 dance schools, studios and hobby groups which offer hobby education and activities in the field of dance	3	125,000
EVS	youth association	a non-profit organisation that brings together more than 1,000 young people to develop debate and integrate debate culture into secondary, higher and adult education	22	131,060
EGL	youth association	voluntary apolitical youth organisation, which aims to help girls develop their potential to become active citizens of the world and unites 700 members	23	75,000
EHKL	youth work association	a non-profit organisation uniting representatives of 35 hobby schools	22	73,000
EML	youth work association	a non-profit organisation that unites 90 music and art schools and is engaged in the preparation and	23	160,000

Name of the organisation	Type (according to NTS § 3)	Description	Years in operation	Total Grant Received in 2019 (in euros)
		production of textbooks and other study materials, training and student competitions		
ENL	union of youth associations	an umbrella non-profit organisation that unites 61 youth associations and participatory councils (incl. youth councils) operating in Estonia in 74 rural and city municipalities and offers guardianship to its members and represents the interests of young people both in Estonia and abroad	18	160,000
TEAHU	youth work association	an umbrella non-proft organisation that brings together more than 120 legal and natural persons involved in the development of non-formal science, technology, engineering and mathematics (STEM) learning	5	140,000
EKSL	youth work association	a non-profit organisation that unites sports clubs of secondary education schools through 20 sports associations or sports federations and that deals with the development of school sports in Estonia	21	437,000
EÕEL	union of youth associations	an informal scholars unions umbrella organisation which aims to represent the interests and opinions of Estonian students and almost 200 scholars councils	20	105,000
ESÜ	youth association	a nationwide youth organisation providing non-formal education to more than 1200 young scouts	22	130,000
EÜL	union of youth associations	a student umbrella organisation which stands for students' rights, needs and interests at national level and support 13 student unions in their work	22	60,000
4H	youth association	an organisation that values rural life and unites more than 1100 young people, the main task of which is to support the diverse development of children and young people. 4H name is formed from English words head, heart, hands, health.	21	110,000
TORE	youth association	a non-profit organisations with more than 600 members which developes and supportes the	20	125,000

Name of the organisation	Type (according to NTS § 3)	Description	Years in operation	Total Grant Received in 2019 (in euros)
		movement of peer (student) supportes.		

Source: ANK … 2021; Eesti Kunstikoolide … 2021; Eesti Noorsootöötajate … 2021; Eesti Tantsuhuvihariduse … 2021; Eesti Väitlusselts … 2021; Eesti Gaidide … 2021; Eesti Huvikoolide … 2021; Eesti Muusikakoolide … 2021; ENL … 2021; Eesti Teadushuvihariduse … 2021; Eesti Koolispordi … 2021; Mis on … 2021; Eesti Skautide … 2021; Millega … 2021; Ajalugu … 2021; Kes me … 2021; Põhikiri … 2021

Appendix 2. Data for DEA analysis from year 2019 annual financial reports

Name of the organisation	Average number of employees	Labour (or staff) costs (€)	Other operating expenses (€)	Total income (€)	Donations and grants distributed (€)	Total income (without donations and grants distrubuted) (€)	Fees received from members (€)	Donations and grants without used annual grant from HTM, and distributed donations and grants (€)	Business income (€)
ANK	8	198,203	34,868	923,138	0	923,138	18,230	825,543	1,365
EKKL	2	17,106	6,129	93,483	0	93,483	1,100	0	14,380
ENK	3	41,612	7,342	113,601	0	113,601	2,090	12,215	32,296
ETHL	6	30,594	50,402	131,050	35,625	95,425	0	3,800	2,250
EVS	3	50,262	16,437	229,284	0	229,284	0	94,328	3,896
EGL	1	21,480	0	101,019	0	101,019	12,311	11,398	1,144
EHKL	1	26,480	40,854	67,642	0	67,642	1,650	0	5,961
EML	4	42,696	12,272	270,608	127,006	143,602	41,228	64,500	4,220
ENL	9	151,703	36,957	422,975	100,212	322,763	0	156,095	7,069
TEAHU	2	35,922	80,674	163,287	46,461	116,826	2,583	18,217	2,487
EKSL	5	126,904	22,475	1,004,206	315,545	688,661	640	251,021	0
EÕEL	2	32,627	1,433	115,823	0	115,823	0	47,549	3,179
ESÜ	4	52,626	26,624	238,352	0	238,352	48,392	55,303	4,657
EÜL	5	148,927	21,117	390,729	0	390,729	0	12,027	317,969
4H	2	35,340	34,605	123,949	0	123,949	18,750	1,600	250
TORE	2	37,615	8,944	139,411	0	139,411	338	0	12,340

Source: Year 2019 annual financial reports of organisations, author's calculations

Appendix 3. Pearson correlation matrix of general information, efficiency score, inputs and outputs for organisations

	Years in operation	Grant from HTM in 2019	Efficiency score	# of workers (inp_1)	inp_2	outp_1	outp_2	outp_3
Years in operation	1							
Grant from HTM in 2019	-0.01	1						
Efficiency score	0.67	0.06	1					
# of workers (inp_1)	-0.17	0.23	0.07	1				
inp_2	-0.63	-0.17	-0.46	-0.07	1			
outp_1	0.38	-0.04	0.56	0.57	-0.41	1		
outp_2	0.18	-0.31	0.20	0.04	-0.03	0.37	1	
outp_3	0.25	0.68	0.52	0.58	-0.40	0.50	-0.12	1

Source: author's calculations

Appendix 4. Instruction file for DEA analysis

eg1-dta.txt DATA FILE NAME

eg1-out.txt OUTPUT FILE NAME

16 NUMBER OF FIRMS

1 NUMBER OF TIME PERIODS

3 NUMBER OF OUTPUTS

2 NUMBER OF INPUTS

1 0=INPUT AND 1=OUTPUT ORIENTATED

1 0=CRS AND 1=VRS

3 0=DEA(MULTI-STAGE), 1=COST-DEA, 2=MALMQUIST-DEA, 3=DEA(1-STAGE), 4=DEA(2-STAGE)

Appendix 5. Output file

Output orientated DEA

Scale assumption: VRS

Single-stage DEA - residual slacks presented

EFFICIENCY SUMMARY:

firm	crste	vrste	scale	
ANK	1.000	1.000	1.000	-
EKKL	1.000	1.000	1.000	-
ENK	0.741	0.743	0.998	drs
ETHL	0.051	0.076	0.672	drs
EVS	0.743	0.795	0.935	irs
EGL	1.000	1.000	1.000	-
EHKL	0.625	1.000	0.625	irs
EML	1.000	1.000	1.000	-
ENL	0.480	0.958	0.501	drs
TEAHU	0.417	0.460	0.908	drs
EKSL	1.000	1.000	1.000	-
EÕEL	1.000	1.000	1.000	-
ESÜ	0.645	0.660	0.977	irs
EÜL	1.000	1.000	1.000	-
4H	0.415	0.415	1.000	-
TORE	0.318	0.407	0.782	irs
mean	0.715	0.782	0.900	

Note: crste = technical efficiency from CRS DEA

vrste = technical efficiency from VRS DEA

scale = scale efficiency = crste/vrste

Note also that all subsequent tables refer to VRS results

SUMMARY OF OUTPUT SLACKS:

firm output:	1	2	3
ANK	0.000	0.000	0.000
EKKL	0.000	0.000	0.000
ENK	0.000	0.000	1.035
ETHL	0.000	0.000	0.000
EVS	0.000	0.000	25.329
EGL	0.000	0.000	0.000
EHKL	0.000	0.000	0.000
EML	0.000	0.000	0.000
ENL	0.000	0.000	0.000
TEAHU	0.000	0.000	31.717
EKSL	0.000	0.000	0.000
EÕEL	0.000	0.000	0.000
ESÜ	0.000	0.000	12.161
EÜL	0.000	0.000	0.000
4H	0.038	0.023	0.000
TORE	0.158	0.000	0.000
mean	0.012	0.001	4.390

SUMMARY OF INPUT SLACKS:

Firm input:	1	2
ANK	0.000	0.000
EKKL	0.000	0.000
ENK	0.000	0.103
ETHL	0.707	0.477
EVS	0.000	0.000
EGL	0.000	0.000
EHKL	0.000	0.000
EML	0.000	0.000

ENL	4.389	0.300
TEAHU	0.000	0.707
EKSL	0.000	0.000
EÕEL	0.000	0.000
ESÜ	0.000	0.000
EÜL	0.000	0.000
4H	0.000	0.270
TORE	0.000	0.000
mean	0.319	0.116

SUMMARY OF PEERS:

firm	peers:			
ANK	ANK			
EKKL	EKKL			
ENK	EÜL	EÕEL	EGL	
ETHL	ANK	EÜL	EML	
EVS	EML	ANK	EGL	EÜL
EGL	EGL			
EHKL	EHKL			
EML	EML			
ENL	EKSL	EÜL	EML	
TEAHU	EÜL	EÕEL	EGL	
EKSL	EKSL			
EÕEL	EÕEL			
ESÜ	EML	EÜL	ANK	EGL
EÜL	EÜL			
4H	EÕEL			
TORE	EÜL	EKKL	EHKL	EGL

SUMMARY OF PEER WEIGHTS:

(in same order as above)

firm	peer weights:			
ANK	1.000			
EKKL	1.000			
ENK	0.460	0.162	0.379	
ETHL	0.232	0.364	0.404	
EVS	0.432	0.098	0.466	0.004
EGL	1.000			
EHKL	1.000			
EML	1.000			
ENL	0.597	0.014	0.389	
TEAHU	0.026	0.897	0.077	
EKSL	1.000			
EÕEL	1.000			
ESÜ	0.659	0.010	0.141	0.191
EÜL	1.000			
4H	1.000			
TORE	0.247	0.013	0.084	0.656

PEER COUNT SUMMARY:

(i.e., no. times each firm is a peer for another)

firm	peer count:
ANK	3
EKKL	1
ENK	0
ETHL	0
EVS	0
EGL	5
EHKL	1
EML	4
ENL	0
TEAHU	0
EKSL	1
EÕEL	3

ESÜ	0
EÜL	7
4H	0
TORE	0

SUMMARY OF OUTPUT TARGETS:

firm	output:	1	2	3
ANK		0.915	0.001	55.000
EKKL		0.166	0.154	36.000
ENK		0.552	0.383	26.610
ETHL		0.829	0.309	52.313
EVS		0.539	0.021	40.416
EGL		0.246	0.011	10.000
EHKL		0.113	0.088	1.000
EML		0.766	0.029	70.000
ENL		0.528	0.023	93.943
TEAHU		0.434	0.046	49.124
EKSL		0.365	0.000	111.000
EÕEL		0.438	0.027	53.000
ESÜ		0.688	0.030	56.070
EÜL		0.845	0.814	31.000
4H		0.438	0.027	53.000
TORE		0.381	0.218	14.756

SUMMARY OF INPUT TARGETS:

firm	input:	1	2
ANK		8.000	0.253
EKKL		2.000	0.248
ENK		3.000	0.328
ETHL		5.293	0.372
EVS		3.000	0.291
EGL		1.000	0.213

EHKL	1.000	0.995
EML	4.000	0.383
ENL	4.611	0.284
TEAHU	2.000	0.291
EKSL	5.000	0.217
EÕEL	2.000	0.294
ESÜ	4.000	0.333
EÜL	5.000	0.435
4H	2.000	0.294
TORE	2.000	0.334

FIRM BY FIRM RESULTS:

Results for firm: ANK

Technical efficiency = 1.000

Scale efficiency = 1.000 (crs)

PROJECTION SUMMARY:

variable	original value	radial movement	slack movement	projected value
output 1	0.915	0.000	0.000	0.915
output 2	0.002	0.000	0.000	0.001
output 3	55.000	0.000	0.000	55.000
input 1	8.000	0.000	0.000	8.000
input 2	0.253	0.000	0.000	0.253

LISTING OF PEERS:

peer	lambda weight
ANK	1.000

Results for firm: EKKL

Technical efficiency = 1.000

Scale efficiency = 1.000 (crs)

PROJECTION SUMMARY:

variable	original value	radial movement	slack movement	projected value

output 1	0.166	0.000	0.000	0.166
output 2	0.154	0.000	0.000	0.154
output 3	36.000	0.000	0.000	36.000
input 1	2.000	0.000	0.000	2.000
input 2	0.248	0.000	0.000	0.248

LISTING OF PEERS:

peer	lambda weight
EKKL	1.000

Results for firm: ENK

Technical efficiency = 0.743

Scale efficiency = 0.998 (drs)

PROJECTION SUMMARY:

variable	original value	radial movement	slack movement	projected value
output 1	0.410	0.142	0.000	0.552
output 2	0.284	0.098	0.000	0.383
output 3	19.000	6.575	1.035	26.610
input 1	3.000	0.000	0.000	3.000
input 2	0.431	0.000	-0.103	0.328

LISTING OF PEERS:

peer	lambda weight
EÜL	0.460
EÕEL	0.162
EGL	0.379

Results for firm: ETHL

Technical efficiency = 0.076

Scale efficiency = 0.672 (drs)

PROJECTION SUMMARY:

variable	original value	radial movement	slack movement	projected value
output 1	0.063	0.766	0.000	0.829
output 2	0.024	0.285	0.000	0.309

output 3	4.000	48.313	0.000	52.313
input 1	6.000	0.000	-0.707	5.293
input 2	0.849	0.000	-0.477	0.372

LISTING OF PEERS:

peer	lambda weight
ANK	0.232
EÜL	0.364
EML	0.404

Results for firm: EVS

Technical efficiency = 0.795

Scale efficiency = 0.935 (irs)

PROJECTION SUMMARY:

variable	original value	radial movement	slack movement	projected value
output 1	0.428	0.110	0.000	0.539
output 2	0.017	0.004	0.000	0.021
output 3	12.000	3.087	25.329	40.416
input 1	3.000	0.000	0.000	3.000
input 2	0.291	0.000	0.000	0.291

LISTING OF PEERS:

peer	lambda weight
EML	0.432
ANK	0.098
EGL	0.466
EÜL	0.004

Results for firm: EGL

Technical efficiency = 1.000

Scale efficiency = 1.000 (crs)

PROJECTION SUMMARY:

variable	original value	radial movement	slack movement	projected value
output 1	0.246	0.000	0.000	0.246

output 2	0.011	0.000	0.000	0.011
output 3	10.000	0.000	0.000	10.000
input 1	1.000	0.000	0.000	1.000
input 2	0.213	0.000	0.000	0.213

LISTING OF PEERS:

peer	lambda weight
EGL	1.000

Results for firm: EHKL

Technical efficiency = 1.000

Scale efficiency = 0.625 (irs)

PROJECTION SUMMARY:

variable	original value	radial movement	slack movement	projected value
output 1	0.113	0.000	0.000	0.113
output 2	0.088	0.000	0.000	0.088
output 3	1.000	0.000	0.000	1.000
input 1	1.000	0.000	0.000	1.000
input 2	0.995	0.000	0.000	0.995

LISTING OF PEERS:

peer	lambda weight
EHKL	1.000

Results for firm: EML

Technical efficiency = 1.000

Scale efficiency = 1.000 (crs)

PROJECTION SUMMARY:

variable	original value	radial movement	slack movement	projected value
output 1	0.766	0.000	0.000	0.766
output 2	0.029	0.000	0.000	0.029
output 3	70.000	0.000	0.000	70.000
input 1	4.000	0.000	0.000	4.000
input 2	0.383	0.000	0.000	0.383

LISTING OF PEERS:

peer	lambda weight
EML	1.000

Results for firm: ENL

Technical efficiency = 0.958

Scale efficiency = 0.501 (drs)

PROJECTION SUMMARY:

variable	original value	radial movement	slack movement	projected value
output 1	0.505	0.022	0.000	0.528
output 2	0.022	0.001	0.000	0.023
output 3	90.000	3.943	0.000	93.943
input 1	9.000	0.000	-4.389	4.611
input 2	0.585	0.000	-0.300	0.284

LISTING OF PEERS:

peer	lambda weight
EKSL	0.597
EÜL	0.014
EML	0.389

Results for firm: TEAHU

Technical efficiency = 0.460

Scale efficiency = 0.908 (drs)

PROJECTION SUMMARY:

variable	original value	radial movement	slack movement	projected value
output 1	0.199	0.234	0.000	0.434
output 2	0.021	0.025	0.000	0.046
output 3	8.000	9.407	31.717	49.124
input 1	2.000	0.000	0.000	2.000
input 2	0.998	0.000	-0.707	0.291

LISTING OF PEERS:

peer	lambda weight

EÜL	0.026
EÕEL	0.897
EGL	0.077

Results for firm: EKSL

Technical efficiency = 1.000

Scale efficiency = 1.000 (crs)

PROJECTION SUMMARY:

variable	original value	radial movement	slack movement	projected value
output 1	0.365	0.000	0.000	0.365
output 2	0.000	0.000	0.000	0.000
output 3	111.000	0.000	0.000	111.000
input 1	5.000	0.000	0.000	5.000
input 2	0.217	0.000	0.000	0.217

LISTING OF PEERS:

peer	lambda weight
EKSL	1.000

Results for firm: EÕEL

Technical efficiency = 1.000

Scale efficiency = 1.000 (crs)

PROJECTION SUMMARY:

variable	original value	radial movement	slack movement	projected value
output 1	0.438	0.000	0.000	0.438
output 2	0.027	0.000	0.000	0.027
output 3	53.000	0.000	0.000	53.000
input 1	2.000	0.000	0.000	2.000
input 2	0.294	0.000	0.000	0.294

LISTING OF PEERS:

peer	lambda weight
EÕEL	1.000

Results for firm: ESÜ

Technical efficiency = 0.660

Scale efficiency = 0.977 (irs)

PROJECTION SUMMARY:

variable	original value	radial movement	slack movement	projected value
output 1	0.455	0.234	0.000	0.688
output 2	0.01	0.010	0.000	0.030
output 3	29.000	14.909	12.161	56.070
input 1	4.000	0.000	0.000	4.000
input 2	0.333	0.000	0.000	0.333

LISTING OF PEERS:

peer	lambda weight
EML	0.659
EÜL	0.010
ANK	0.141
EGL	0.191

Results for firm: EÜL

Technical efficiency = 1.000

Scale efficiency = 1.000 (crs)

PROJECTION SUMMARY:

variable	original value	radial movement	slack movement	projected value
output 1	0.845	0.000	0.000	0.845
output 2	0.814	0.000	0.000	0.814
output 3	31.000	0.000	0.000	31.000
input 1	5.000	0.000	0.000	5.000
input 2	0.435	0.000	0.000	0.435

LISTING OF PEERS:

peer	lambda weight
EÜL	1.000

Results for firm: 4H

Technical efficiency = 0.415

Scale efficiency = 1.000 (crs)

PROJECTION SUMMARY:

variable	original value	radial movement	slack movement	projected value
output 1	0.166	0.234	0.038	0.438
output 2	0.002	0.003	0.023	0.027
output 3	22.000	31.000	0.000	53.000
input 1	2.000	0.000	0.000	2.000
input 2	0.564	0.000	-0.270	0.294

LISTING OF PEERS:

peer	lambda weight
EÕEL	1.000

Results for firm: TORE

Technical efficiency = 0.407

Scale efficiency = 0.782 (irs)

PROJECTION SUMMARY:

variable	original value	radial movement	slack movement	projected value
output 1	0.091	0.133	0.158	0.381
output 2	0.088	0.129	0.000	0.218
output 3	6.000	8.756	0.000	14.756
input 1	2.000	0.000	0.000	2.000
input 2	0.334	0.000	0.000	0.334

LISTING OF PEERS:

peer	lambda weight
EÜL	0.247
EKKL	0.013
EHKL	0.084
EGL	0.656

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