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Efficiency and Fairness in Financing Slovak National Sports Associations

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Abstract:

National sports associations are private-sector sports organisations with an exclusive, monopoly position for a particular type of sport within individual countries. This monopoly position is done by the internal regulations of international sports associations, of which only one entity for a given country can become a member, which its country represents at the international level. The legislation of individual countries also regulates National sports associations. The main aim of this contribution is to assess and benchmark the technical efficiency of 70 sports associations offering their services in Slovakia by a set of Data Envelopment Analysis (DEA) models and to consider fairness in the financing of Slovak national sports associations. It is important to note that all models used have different premises in their modelling, each of them solves optimisation problems of real live under specific conditions. The arguments for evaluating fairness in financing are based on the methodology of the breakdown of financial subsidies for sport and on controlled interviews with experts of the state administration and national sports associations. Based on our analysis, we can state that the system of financing Slovak national sports associations is neither efficient nor fair in the redistribution of public funds from the point of view of meeting the goals of

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public policy in the field of sport. The outcome of the research may be of interest to regulatory institutions, as well as to the management of individual national sports associations.

Keywords:

data envelopment analysis, efficiency, finance, national sports associations, redistribution of public funds

1. Introduction

The obtaining the status of a national sports association is a fundamental prerequisite for obtaining public funds. One of the main tasks in public funding of sport is achieving efficiency of public funds spent. Other objectives of public policy in sports include supporting and developing youth sports, ensuring the preparation and participation of athletes in major competitions, protecting the integrity of sport, promoting a healthy lifestyle, and the like. In our contribution, we focus on assessing the technical efficiency of the Slovak national sports associations.

Act no. 440/2015 on Sport and the Amendment of Certain Acts in Accordance with Later Regulations (from now on, Sports Act) contains rules of conditions for obtaining the status of a national sports association in Slovakia (Act No. 440/2015 on Sport and on the Amendment of Certain Acts in Accordance with Later Regulations, 2015). Figure 1 visualises the criteria for exclusive representation in sports and the criteria for ensuring compliance between internal management acts and processes and the Sports Act.

Figure 1:
Scheme of conditions for obtaining the status of a national sports association in Slovakia

A. Criteria for the exclusive representation in the sport	
	• membership in an international sports organisation with worldwide operations for the sport in question • have exclusive competence to preside over the relevant sport in the territory of the Slovak Republic • have at least five competing sports clubs registered in the register of legal entities in sport and at least 100 active athletes registered in a sports club in the register of natural persons in sport • organise a national competition for adults and young people for at least two consecutive years • preside over the selection and recruitment of athletes to national teams and their participation in international competitions • provide support for talented athletes

B. Criteria for ensuring compliance between internal management acts and processes and the Sports Act	
	• the statutes must be per Sections 19 to 23 of the Sports Act • incorporate into the regulations of the National Sports Association the rules of the World Anti-Doping Programme, measures against manipulation of the course and results of competitions and other rules and measures against negative phenomena in sports resulting from international regulations and decisions • keep records of contracts and agreements under Sections 35, 39, 43, 47 and 48 and their amendments • provide cooperation to the Ministry of Education, Science, Research and Sport of the Slovak Republic (from now on, MESRS), since 2024, the Ministry of Sport and Tourism (from now on, MST) and other public administration bodies in fulfilling tasks in the field of sport • meet the conditions for the eligibility of the recipient of public funds under Section 66 of the Sports Act

Source: processed by the authors using information specified in the Sports Act (2015).

According to the Sports Act (2015), national sports associations are private-sector sports organisations with an exclusive, monopoly position in a particular type of sport. This monopoly position is created on the one hand by the internal regulations of international sports associations, of which only one entity per country can become a member, which it then represents at the international level and by the legislative environment of individual countries. The Sports Act of the Slovak Republic and similar legal acts of other countries allow only one organisation to obtain the status of a national sports association (Kučera & Nemec, 2022).

This paper focuses on the technical efficiency of 70 Slovak national sports associations from 2022 – 2023. A set of Data Envelopment Analysis (DEA) models (CCR, BCC, SBM-C, SBM-V, Super-SBM-C, Super-SBM-V) is used to assess and benchmark their technical efficiency. It is important to note that all used models have different premises in their modelling, therefore it cannot be stated which is better to analyse the efficiency of national sports associations in using the financial and human resources to achieve their goals. Each of them solves optimisation problems of real live under specific conditions.

Public policy and public policy objectives in the field of sport should be based on the paradigm of a rationally acting policy at the regional, national or international level. Vitálišová et al. (2017) perceive several possible definitions of public interest – as the sum of individual interests, the common interest of, for example, municipalities or communities, and the like. The public interest, in which the public does not participate through the instruments of direct democracy, is also a controversial concept from the point of view of its use in professional literature focused on public finances. For the field of sport, we will therefore use the term "public policy in the field of sport" or "public policy objectives in the field of sport", which are mainly formulated by central and local authorities. Fiľa and Juránová (2015) point out that strategic public policy documents often have only a declaratory character and set goals, and their fulfilment is not further

monitored and regularly evaluated. From the point of view of public policy, the strategic White Paper on Sport, which was prepared by the European Commission in 2007, states that the Member States and sports organisations are involved in the governance of sports affairs, with the central role of sports federations for the given sports (European Commission, 2007). The strategic document in question attributes the following social dimension to sport in particular:

- Improving the level of public health
- Anti-doping
- Strengthening the role of sport in education and training
- Promoting volunteering and active citizenship
- Harnessing the potential of sport for social inclusion
- Preventing racism and violence
- Promoting the values of the European Community in the world
- Promoting sustainable development.

The Sports Act in Section 2 (Act No. 440/2015 on Sport and on the Amendment of Certain Acts in Accordance with Later Regulations, 2015), defines the public interest as follows: "The public interest in sport is the support and development of youth sports, ensuring the preparation and participation of the sports team of the Slovak Republic (from now on referred to as the "sports team") in an important competition, the protection of the integrity of sport and the promotion of a healthy way of life of the population". According to the above-mentioned strategic document for the field of sport, the state and sports organisations of the private sector, which is mainly represented by national sports associations (which bring together sports clubs), are to participate in the fulfilment of the social mission of sport and therefore the participation of public funds in the fulfilment of this mission is necessary. Gwartz and Spence (2020) also agree that the issue highlights associations' participation in the fulfilment of the social mission of sport. The reason for the involvement of sports associations in the fulfilment of the social tasks of sport is their know-how for the sport they represent and their monopoly position for the fulfilment of selected tasks related mainly to ensuring the sports representation of the country (the possibility of registering athletes for international sports events) and the development of a specific sport at the international and national levels (e.g. methodological guidelines for the given sport, preparation of sports experts for the given sport, their certification, or the resolution of disciplinary offences and many other tasks). However, Mitchell et al. (2012) draw attention to the relatively sensitive area of the connection between politics and sports concerning the financing of professional sports from public funds.

In the case of sports, it would not be possible to ensure the optimal functioning of organised sports without public funds. As an example of a high share of public subsidies, we can mention the structure of financial resources of national sports associations –

private sector organizations in Slovakia. In the case of the Slovak Association of American Football, public funds make up 74% of the planned budget for 2020; in the case of the Slovak Ice Hockey Association, it is up to 97%. The national sports associations in Slovakia participate in fulfilling public policy goals in the field of sport (and thus also in the provision of collective goods), such as sports representation.

According to the KPMG study from 2018 "Concept of Sports Financing in the Slovak Republic 2017" (KPMG, 2018), the dominant part of the total financial resources for sport are public funds provided by the Ministry of Education, Science, Research and Sport of the Slovak Republic (from now on referred to as the "Ministry of Education") with a share of up to 49.8% of the total, followed by the budgets of municipalities – 47.6% and other government institutions (the Ministry of Interior of the Slovak Republic and the Ministry of Defence of the Slovak Republic) with a share of 2.6%.

Table 1:

Structure of allocated financial funds for sports in 2023

Sports	Approved in EUR	Adjusted in EUR
(026 01) Sports for all, school and university sports	1 200 000	1 550 000
(026 02) Recognised sports (regular transfers)	57 399 878	61 570 697
(026 02) Recognised sports (capital transfers)	800 000	1 192 300
(026 03) National sports projects (regular transfers)	13 049 970	14 785 098
(026 03) National sports projects (capital transfers)	0	30 180
(026 04) Sport infrastructure (capital transfers)	0	4 000 000
(026 05) Cross-cutting activities (current transfers)	300 000	34 951
(026 05) Cross-cutting activities (goods and other services)	48 585	107 497
(026 07) Sports Support Fund	20 000 000	20 000 000
(026 08) Contributions for the merits of athletes	1 361 117	1 710 368
Subtotal	94 159 550	104 981 092
Directly managed organisations of the Ministry		
Anti-Doping Agency of the Slovak Republic (026 05)	499 203	499 203
National Sports Centre (026 05)	1 192 452	1 686 316
Anti-Doping Agency of the Slovak Republic (0EK 0F) - expenditures on info	30 220	30 220
National Sports Centre (0EK 0F) – expenditures on info	60 000	101 136
Total Sports (programme 026)	95 941 425	107 297 967

Source: processed by the authors, The Ministry of Education, Science, Research and Sport of the Slovak Republic (from now on, MESRS): <https://www.minedu.sk/financovanie-sportu/>

The most significant source of public funds (and at the same time, the only source intended only for national sports federations representing recognised sports) are the

funds allocated under subclusters 026 02 for current and capital transfers, which are provided in the form of a contribution to a recognised sport – a new form introduced by the Sports Act, which changed the original non-claimable subsidy financing system into a claimable one (Kučera & Nemec, 2022).

The research questions in our contribution are as follows:

1. Are Slovak national sports associations efficient in using human and public financial sources in achieving their sporting success?
2. Is the current model of financing national sports associations in Slovakia fair in redistributing public funds, thus creating a prerequisite for a more efficient use of these funds?

To the best of the authors' knowledge, this paper presents the first empirical study on the technical efficiency of the national sports associations in the Slovak Republic or other Central European countries. Moreover, the paper makes a significant methodological contribution by its application of not only rudimentary radial but also advanced non-radial DEA models to allow multiple assessments of the efficiency of the national sports associations. In addition, the research provides evidence of economies of scale and scope in the national sports associations. The contribution is structured as follows. A brief literature review follows the introduction, a description of the data and model specifications, a report and discussion of the leading research results, and a conclusion.

2. Literature review

As demonstrated in several studies, data envelopment analysis (DEA) is a valuable tool for evaluating and comparing the performance of nations competing in the Olympic Games (Churilov & Flitman, 2004; Li et al., 2007; Li et al., 2015). In their research, Churilov and Flitman (2004) demonstrated that key measures frequently reported in the media lack the necessary descriptive power. Therefore, the Data Envelopment Analysis (DEA) based models were used to produce a new ranking of participating teams that was acceptable and "fair" to most participants. In the paper of Li et al. (2008), assurance regions (ARs) have been used to refine the DEA results further. These AR DEA models assume that ARs apply uniformly across all nations. Such models can have shortcomings in the sense that different nations may impose different ARs, as nations may value gold, silver, and bronze medals differently. Their paper extends previous DEA studies by incorporating multiple sets of nation-specific ARs into the DEA. By doing so, authors establish fair models for measuring and benchmarking the performance of nations at six summer Olympic Games. The study of Li et al. (2015) measures the

performance of participating nations at the Olympics, considering the quest for medals as a two-stage Olympic process. The first stage is characterised as athlete preparation (AP), and the second is athlete competition (AC). They extend the relational model from the constant returns to scale framework to the variable returns to scale version. The efficiency of each participating nation in the entire two-stage Olympic process is calculated as a product of the efficiencies of both stages, and a heuristic search is applied to the extended relational model. The efficiency of each stage can be obtained, and directions for improving the performance of participating nations in the two-stage Olympic process can be identified. An empirical study of the 2012 London Summer Olympic Games reveals that the efficiency of the AP stage is higher than that of the AC stage for most participants. In addition, a plot of the relationship between these three efficiencies shows that the efficiency of the entire two-stage Olympic process is more significantly related to that of the AC stage than that of the AP stage.

Other studies aim to evaluate efficiency in individual sports. The study of Guzmán and Morrow (2007) dealt with measuring the efficiency of clubs in the English Premier League. Information from clubs' financial statements was used to measure corporate performance. The Malmquist non-parametric technique derived from the DEA was used to measure changes in efficiency and productivity. The study concludes that while clubs operate close to efficient levels for the assessed models, there is a limited technological advance in their performance in displacing the technological frontier. Many articles, such as Haas (2003), Haas et al. (2004) and others, are mainly oriented on the efficiency evaluation of teams and not the individual players.

On the contrary, the research of Jablonsky (2021) aims to combine both approaches and investigate the relationship between the individual efficiency of the players and the teams' efficiency. The first step is the evaluation of individual efficiencies, and the second is aggregating the teams' performance within a competition (League). The idea is to evaluate the efficiency of individual players in certain positions and explore how the individual efficiencies contribute to the teams' efficiency. Individual efficiency is measured using traditional radial and slacks-based measure DEA models. Team efficiency is derived in several ways: traditional DEA models with the variables describing the genuine achievements of the teams, parallel DEA models that consider all positions and players, and actual results of the teams in the League, which is the true performance of the team. The study is based on the Canadian-American National Hockey League (NHL) statistics for 2019/2020. The results of the analysis are compared and discussed. They show that the team's actual performance is not always directly dependent on the individual performances of the team members.

A comprehensive review of data envelopment analysis in sports was published by Bhat et al. (2019), which followed up on the seminal paper of Emrouznejad and Yang (2017). They present an extensive study of various models of DEA in the following sports: baseball, basketball, cricket, cycling, football, golf, handball, the Olympics, and

tennis. They proved that DEA identified the sources of inefficiency in different team and individual games by means of benchmarking analysis and provided possible direction for improvement. According to the authors, DEA proved to be an excellent technique for performance assessment in sports. Among the nine sports, football has been scrutinised a lot by operation research. Researchers were more interested in the performance analysis of English football clubs. There are scarce studies of football clubs from other countries. The reason is that English football clubs were first appearing on the stock market. It was also observed from the analysed articles that only the performance of male players in different sports was taken into confidence by different authors. A sample of contributions on the use of DEA in the "sports industry" with heterogeneous inputs and outputs is displayed in Table 2.

Table 2:
Sample of papers on the use of DEA in sport

Author	Methodology	Inputs	Outputs
Football			
Haas (2003)	CCR + BCC model	Club ´s total wages and salaries, coach salary and club ´s hometown population	Points awarded during the season and total revenues
Haas, D.J. (2004)	CCR + BCC model	Club ´s total wages and salaries, coach salary and club ´s hometown population	Points awarded during the season, total revenues and average stadium utilisation
Golf			
Fried et al. (2004)	CCR	Driving distance, drives in fairway, greens hit in regulation, number of putts per green, scrambling and sand	Earnings per event
Baseball			
Howard and Miller (1993)	CCR model	Stolen bases, games played, official at-bats, runs scored, hits, doubles, triples, home runs, runs batted in, batting average, putouts, assists, errors fielding average	The total salary of players
Olympics			
Li et al. (2007)	Two stage DEA model	GDP per capita (in US dollars) and population of the country.	Number of gold, silver, and bronze medals won
Li et al. (2015)	BCC model	GDP per capita and population	Numbers of gold, silver, and bronze medals

Source: Based on Bhat et al. (2019)

Several authors addressed the issue of mechanisms for the allocation of public resources in sports, such as Andreff and Szymanski (2006); Andreff (2009); De Carlos et al. (2017); Downward et al. (2009); Downward et al. (2019); Kasale et al. (2018); King (2009); Lowther et al. (2016); Mitchell et al. (2012); Wilson (2011); and Groothuis and Rotthoff (2016). The issue was also addressed by Czech and Slovak authors such as Pavlík and De Vries (2013, 2014); Pavlík (2013); and Novotný et al. (2011).

A literature review reveals no research by DEA models on the technical efficiency of national sports associations in Central Europe. So, we applied an input-oriented version of [i] radial CCR model by Charnes, Cooper and Rhodes (1978) under constant return of scale, [ii] radial BCC model by Banker, Charnes and Cooper (1984) under variable return to scale, [iii] non-radial SBM-C model by Tone (2002) under constant return to scale, [iv] non-radial SBM-V model by Tone (2001) under variable return to scale, [v] non-radial Super-SBM-C model by Tone (2002) under constant return to scale, [vi] non-radial Super-SBM-V model by Tone (2002) under variable return to scale. Studies focusing on economies of scale and scope have considerably influenced our research.

3. Data and model specification

Our paper examined 70 national sports associations allocated in Slovakia in December 2022. Variable selection was based on the empirical studies described above and data availability. Table 3 reveals the description of input and output. Input variables (I) represent the number of active sportspeople (AS) in Slovakia and financial sources provided to recognised national sports associations (F) in EUR in 2022. The outputs (O) of our models are the coefficient of significance of the success in a particular sport in the category for adults (CA) and the coefficient of significance of the success in a particular sport in the category for youths (CY) for the year 2023. Both composite indexes, the coefficient of significance of the success in a particular sport in the category for adults and the coefficient of significance of the success in a particular sport in the category for youths, are also methodologically described in Kučera and Nemec (2022).

Table 3:

Description of input and output variables

Input (I)/ Output (O)	Notation	Description
I	AS	Active sportspeople, in number
I	F	Finance provided to recognised sports, in EURO
O	CA	Coefficient of significance of the success in a particular sport in the category for adults.
O	CY	Coefficient of significance of the success in a particular sport in the category for youths.

Source: Authors' own, 2024

Table 1 in the appendix contains input and output variables that were revealed on the website of the Ministry of Education, Science, Research and Sport of the Slovak Republic (from now on, MESRS). It includes input variables, that are the number of

active sportspeople (AS) in Slovakia, financial sources provided to recognised national sports associations (in EUR) in 2022, and the output variables that consist of the coefficients of the significance of the success in a particular sport in the category for adults and the coefficients of the significance of the success in a particular sport in the category for youths in 2023.

The coefficient of significance of the success in a particular sport in the category for adults (CA) and the coefficient of significance of the success in a particular sport in the category for youths (CY) are derived from the formula for calculating the contribution to a recognised sport, the provider of which is currently the Ministry of Tourism and Sport of the Slovak Republic (until 1.2.2024 the Ministry of Education, Science, Research and Sport of the Slovak Republic) and which forms the primary source of funding for national sports associations. The calculation formula is as follows:

$$P = (A \times CA + A \times CY) \times (B \times ID + C \times IA) + (1 - 2 \times A) \times Y23$$

where

- P proportion of the finance for the recognised sport concerned,
- A the weight of the achieved sports success in percentage,
- B the weight of interest in sports on a national level in percentage,
- C the weight of interest in sport on an international level in percentage,
- CA coefficient of the significance of the success in a particular sport in the category for adults,
- CY coefficient of the significance of the success in a particular sport in the category for youths,
- ID interest in the recognised sport in question on the national level,
- IA interest in the relevant recognised sport on the international level calculated based on audience surveys in the media abroad,
- Y23 average number of active athletes in a recognised sport under 23.

The share of recognised sports represents the output of production, while the higher the value of a given output, the more public funds a national sports association can obtain. This is a figure that should theoretically express the % share of the total amount of allocated public funds. An exception is the share of two national sports associations, which is fixed for the Slovak Football Association at 17% share and 13% share for the Slovak Ice Hockey Association. The coefficient of the significance of the success in a particular sport in the category for adults (CA) and the coefficient of the significance of the success in a particular sport in the category for youths (CY) can be considered composed indicators as they include information on the weight of the achieved sports success in percentage, the weight of interest in sports on a national level in percentage, the weight of interest in the sport on an international level in percentage, interest in the recognised sport in question on the national level, interest in the relevant

recognised sport on the international level calculated based on audience surveys in the media abroad and average number of active athletes in a recognised sport under 23.

Table 4 presents the descriptive statistics of the Slovak national sports associations' variables for 2022. The average number of active sportspeople in national sports associations reached approximately 1,964 individuals. As the median number of active sportsmen is considerably lower, the national sports associations are highly unequal in size of their members. There are considerable differences in the minimum and maximum values for the number of active sportspeople and financial sources allocated to the national sports associations.

Table 4:

Descriptive statistics of variables

	AS	F	CA	CY
Mean	1964	846359	5.81	5.47
Median	171	162818	3.07	2.24
Standard Deviation	8481	2064055	6.99	8.52
Minimum	5	31785	0.19	0.19
Maximum	70020	12909778	46.29	51.83
Count	70	70	70	70

Source: Authors' own, 2024

The coefficients of the significance of success in a particular sport in the category for adults and the coefficients of the significance of success in a particular sport in the category for youths are both composite indicators of success. Their sum is 100, so the standard deviation is considerably lower than in the case of input variables.

A set of input-oriented Data Envelopment Analysis (DEA) models (CCR-I, BCC-I, SBM-C, SBM-V, Super-SBM-C, Super-SBM-V) are applied to answer the first research question. Based on Thanassoulis (2001) and Zimková (2016), let us assume a set of homogeneous production units $DMU_1, DMU_2, \dots, DMU_n$. Each of these units DMU_o , $o = 1, \dots, n$, produces m inputs and a vector of inputs is $\bar{x}_o$ and s outputs and a vector of outputs is $\bar{y}_o$. Assume that $\mathbf{X}_{m \times n}$ is a matrix of all m inputs of n production units and $\mathbf{Y}_{s \times n}$ is a matrix of all their s outputs. For a given decision-making problem, a Production Possibility Set (PPS) exists, given the production process technology, comprising permissible combinations of all inputs and outputs. Assuming a constant return to scale, the production possibility set is as follows:

$$PPS_{CRTS} = \{ (\bar{x}, \bar{y}) \mid \bar{x} \geq \mathbf{X}\bar{\lambda}, \bar{y} \leq \mathbf{Y}\bar{\lambda}, \bar{\lambda} \geq \bar{0} \},$$

assuming variable return to scale:

$$PPS_{VRTS} = \{ (\bar{x}, \bar{y}) \mid \bar{x} \geq \mathbf{X}\bar{\lambda}, \bar{y} \leq \mathbf{Y}\bar{\lambda}, \bar{\lambda} \geq \bar{0}, \bar{e}'\bar{\lambda} = 1 \},$$

while the symbol $\bar{e}'$ denotes the corresponding unit vector in the form of $\bar{e}' = (1, \dots, 1)'$ and symbol $\bar{\lambda}$ represents the corresponding vector of weights in the form of $\bar{\lambda} = (\lambda_1, \dots, \lambda_n)'$. Technically the most efficient decision-making units determine the efficient frontier called the Production Possibility Frontier (PPF). A problem of mathematical programming is solved for each DMU_o , $o = 1, \dots, n$ while looking for such a combination of inputs and outputs, so to keep the DMU_o within the production possibility set and make it technically efficient.

To answer our research questions, we use input-oriented models under a constant and variable return to scale. We start with the input-oriented Charnes, Cooper and Rhodes (CCR-I) model, which performs under constant return to scale (Charnes et al., 1978). Then, we continue with the radial input-oriented Banker Charnes Cooper model (BCC-I model) that works under a variable return to scale (Banker et al., 1984). The non-radial model under constant return to scale Super-Slacked Based Measure model (Super-SBM-I-C model) by Kaoru Tone (2002) was applied to detect outliers. Finally, a non-radial model under a variable return to scale Super-Slacked Based Measure model (Super-SBM-I-V model) by Kaoru Tone (2002) was applied. Jablonský (2012) and Jablonský and Dlouhý (2015) have alternative options for calculating super efficiency.

4. Results, discussion, and recommendations

DEA is currently one of the most popular techniques for analysing the efficiency of economic units, which contain the same inputs and outputs. The aim is to identify the most efficient organisations and indicate the actions that inefficient ones must take to become efficient. The advantages of DEA include the following:

- It can work with inputs and outputs at different measurement scales.
- It can analyse each DMU individually, compare it with other DMUs, and optimise all DMUs in the sample.
- It takes into consideration return to scale (constant or variable).
- It can identify inefficient DMUs, indicating benchmarks.

The relationship of the inputs and outputs is illustrated by the correlations of the variables, which are shown in Table 5. According to Pearson's correlation coefficient, a strong positive correlation exists between the number of active sportspeople and the contribution amount provided. This is a logical assumption – more significant and, therefore, more numerous associations have a higher volume of public funds. A very low level of positive dependence was identified between the number of active sportspeople and the coefficients of significance of youth and adult outcomes. Therefore, in the context of achieving sporting success, it is not the number of active sportspeople within the associations that is important, but rather the qualitative characteristics of the preparation of sportspeople who participate in sports competitions.

Table 5:
Pearson's correlation coefficients

	AS	F	CA	CY
AS	1			
F	0.81	1		
CA	0.25	0.50	1	
CY	0.12	0.44	0.83	1

Source: Authors' own, 2024

As public funds are the dominant component of the budgets of national sports associations, these funds must be used economically, effectively and efficiently, as the funding system is intended to create the conditions that can be applied in practice. Public funds, not only in Slovakia, should be used to meet public policy objectives in the field of sport, which are clearly expressed in the form of measurable indicators/benchmarks. At the same time, such a system should allow adjustment of allocation and use of public funds that could make meeting these objectives more effective, transparent and fair for everybody (Kučera & Nemec, 2022).

The first research question on the technical efficiency in the use of human and financial sources by the Slovak national sports associations is revealed by the coefficients of technical efficiency. The Slovak national sports associations that reached the technical efficiency score on level 1 are technically efficient, which means they use human and public finance sources to achieve their successes efficiently. The concrete answers to the first research question are concentrated in Appendix 3, including the best and worst Slovak national sports associations according to six DEA models. The most inefficient Slovak national sports associations (as indicated by several DEA models) are the football, baseball, and volleyball associations. Special attention was paid to the

economy of scale and scope. Under constant return to scale (CCR-I, SBM-I), the technical efficiency was reached by four Slovak sports associations: the Korfball Association, Lacrosse Association, Curling Association, and Sports Fishing Technique Association, which use human and public financial sources to reach their aims efficiently. Models working under variable return to scale revealed (by definition) more technically efficient national sports associations. According to radial BCC-I, the technical efficiency was reached by ten national sports associations: the Association of American Football, the Association of the Chinese Wushu, the Association of Bodybuilding and Fitness, the Frisbee Association, the Korfball Association, the Baseball Association, the Petanque Association, the Canoe Association, the Lacrosse Association, and the Muay-Thai Association. The non-radial SBM model working under variable return to scale also revealed ten technically efficient national sports associations: the Association of Bodybuilding and Fitness, the Frisbee Association, the Korfball Association, the Canoe Association, the Lacrosse Association, the Muay-Thai Association, the Squash Association, the Curling Association, the Sports Fishing Technique Association, and the Weightlifting Association. Football, Baseball, and Volleyball are the most inefficient Slovak national sports associations.

The super-efficiency score is a tool to measure outliers when the technical efficiency score is more than 3.5. In our sample, the statistical outlier is the Slovak Canoe Association. This sports association can gain outstanding performance from its sportspeople and public financial sources. The sample of the efficient and inefficient Slovak national sports associations is disclosed in Appendix 4. It includes the actual data, projection, and differences in the efficient Slovak Korfball Association; for example, there is no difference between reality and optimised projection. The rest of the revealed associations in Appendix 4 are highly inefficient: Slovak Gymnastics Association at 97 %, Slovak Basketball Association, Slovak Athletics Association, Slovak Volleyball Association, Slovak Baseball Association at 98 %, and Slovak Football Association at 99%. High inefficiency expressed as differences between the actual situation in the number of sportspeople and optimised numbers of sportspeople, as well as differences between accurate financial sources given to national sports associations and optimised financial sources given to the national sports associations, prove high inefficiency of human and financial resources management in the majority of national sports associations.

Sports associations can improve the efficiency of used resources by implementing innovative approaches and computing systems in input management, such as DEA analysis. Fila (2017) states that innovations bring progress at the macro and micro levels of the economy. At the same time, Fila and Juránová (2015) claimed that if the entity wants to survive, it must keep up with technical developments and adapt to constant changes. Kučera et al. (2008) considered innovative computing systems as a key element that can determine success from the beginning of each planned investment.

The second research question focuses on the fairness of the current model of financing national sports associations in Slovakia regarding the redistribution of public funds. The proportion of the finance for the recognised sport concerned (P) should be the % share of the total public funds allocated. The exception is the share of two national sports associations from the contribution to a recognised sport, which has been fixed since 1 January 2017 for the Slovak Football Association (17%) and the Slovak Ice Hockey Association (13%), but which is reduced by the contribution to the national sports project. There is no motivation for better sports results for these two sports associations. However, the share of recognised sport (P) does not represent a % share of the total amount of allocated public funds due to the fixation of a stable amount of the annual contribution for associations in the form of so-called financial brakes. The maximum year-on-year decrease in the income of a particular sports association is 90%. The maximum year-on-year increase in financial revenues of a particular sports association is 120%. In addition, the Slovak Ice Hockey Association has a fixed contribution of 13%, and the Slovak Football Association has 17% of the total volume of allocated contribution funds for the given year, regardless of the achieved share coefficient. The financial brake system, particularly the fixed contributions for the two largest national sports associations, significantly distorts the volume of public funds provided. Based on our analysis, in 2020, the Slovak Ice Hockey Association received 62% more public funds from the contribution of a recognised sport, and vice versa, the Slovak Basketball Association received 22% less funds than they should have received in terms of the calculated share of recognised sport without a system of brakes and fixations. According to the results, the Slovak Floorball Association received up to 53% less funds than it had.

The fairness of the current model of financing national sports associations in Slovakia regarding the redistribution of public funds was the central issue of the controlled interviews with three highly posited experts of the state administration and three representatives of national sports associations. The interview consisted of 10 questions, the aim of which was to summarise the opinions of experts in the field of sports financing on the new and previous systems and methodology of financing national sports associations in Slovakia. Appendix 5 summarises the outputs from controlled interviews. According to the individual answers, a different view of the new financing methodology of national sports associations by experts from the state administration and national sports associations is evident. The sports associations clearly perceived the increase in the volume of public funds as positive, and they appreciated the opportunity to meet public policy goals in sports better. From the point of view of state administration representatives, the performance improvement has only been partial. At the same time, goals such as sports success or the share of the sporting population have stagnated or deteriorated, respectively. The sports associations perceive the new method of financing as motivational, mainly due to a significant increase in the volume of public funds.

On the contrary, on the part of representatives of the state administration, it is more demotivating due to the "financial brakes" system and the influence of global/domestic interest in specific sports. Moreover, a fixation on the amount has been introduced for Slovakia's two most significant sports associations, which represent football and ice hockey. Representatives of the sports associations would welcome the liberalisation of the conditions for using the contribution to the legislative changes to the financing system. Representatives of the state administration would welcome a more fundamental change in the financing of sport, which would reflect the so-called "value for money in sport", the fulfilment of benchmark indicators of public policy objectives in the field of sport and the improvement of conditions for mutual competition between associations in obtaining public funds.

5. Conclusion

Based on our analysis, we can state that the system of financing Slovak national sports associations is neither efficient nor fair in the redistribution of public funds from the point of view of meeting the goals of public policy in the field of sport. The first aim of this contribution was to assess and benchmark the technical efficiency of 70 national sports associations offering their services in Slovakia over the period 2022 – 2023 by a set of rudimentary and advanced Data Envelopment Analysis (DEA) models (CCR, BCC, SBM-C, SBM-V, Super-SBM-C, Super-SBM-V). The economy of scale and scope was taken into consideration. Under constant return to scale (CCR-I, SBM-I), the technical efficiency was reached by four Slovak sports associations: the Korfball Association, Lacrosse Association, Curling Association, and Sports Fishing Technique Association. Models working under variable return to scale revealed (by definition) more technically efficient national sports associations. According to radial BCC-I, the technical efficiency was achieved by ten national sports associations: the Association of American Football, the Association of the Chinese Wushu, the Association of Bodybuilding and Fitness, the Frisbee Association, the Korfball Association, the Baseball Association, the Association of Petanque, the Canoe Association, the Lacrosse Association, and the Muay-Thai Association. The non-radial SBM model working under variable return to scale also revealed ten technically efficient national sports associations: The Association of Bodybuilding and Fitness, the Frisbee Association, the Korfball Association, the Canoe Association, the Lacrosse Association, the Muay-Thai Association, the Squash Association, the Curling Association, Sports Fishing Technique Association, and the Weightlifting Association. Football, Baseball, and Volleyball are the most inefficient Slovak national sports associations. The best performer is the Slovak Canoe Association, which can gain outstanding performance from its sportspeople and public financial sources. The super-efficiency model reflected the outlier position of the

Canoe Association compared to the rest of the national sports association. The results distinguish the varying levels of technical efficiency among national sports associations.

Differences between the actual situation in the number of sportspeople and optimised numbers of sportspeople, as well as differences between accurate financial sources given to national sports associations and optimised financial sources given to the national sports associations, prove the high inefficiency of human and financial resources management in the majority of national sports associations. Therefore, the goal of public policy in the field of sports, ensuring sports representation and achieving sports success, cannot be reached by the currently valid system of financing national sports associations, as most do not use public funds as well as the potential of the membership bases effectively.

According to our analyses, the volume of public funds that are used inefficiently by associations is at the level of approximately 51.2 – 56.5 million EUR, which is more than 1/2 of the total volume of public funds allocated in the sport – programme 026 intended to finance the field of sports per annum. The funds could be reallocated for other purposes, or it is necessary to adjust the system of financing national sports associations in such a way that it creates pressure for more effective fulfilment of public policy objectives in the field of sport – specifically, achieving sporting success. At the same time, we can state that the system of financing associations is neither fair nor effective in the redistribution of public funds from the point of view of meeting the goals of public policy in the field of sport, which was confirmed by the outputs of the analytical part, but also by guided interviews (especially by the addressed experts from the ranks of the state administration). From the point of view of a fair distribution of public funds, the system of financial brakes and the fixation on the amount of public funds provided seem to be problematic. This system significantly reduces the competitiveness of associations in obtaining public funds and, at the same time, does not create pressure for more effective fulfilment of public policy objectives (the so-called "value for money") in achieving sports success and increasing sports activity of the population (in the case of associations, an indicator of the number of active athletes up to 23 years of age).

To the best of the authors' knowledge, this study is the first to analyse the technical efficiency of Slovak and other Central European national sports associations using DEA models, making a significant contribution to the literature.

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Appendix

Appendix 1: Input and output (O) variables of DEA models

National Sports Associations	(I)AS	(I)F	(O)CA	(O)CY
Slovak Association of American Football	66	31 785	0.28	0.20
Slovak Association of Boccia Sports	87	66 872	2.03	3.75
Slovak Association of The Chinese Wushu	129	31 785	0.27	0.22
Slovak Association of Bodybuilding and Fitness	722	729 789	10.71	28.36
Slovak Frisbee Association	40	38 726	5.27	0.21
Slovak Korfball Association	120	31 785	9.24	9.24
Slovak Automobile Association	536	284 333	6.56	0.51
Slovak Arm-wrestling Association	151	31 785	3.91	3.61
Slovak Association of Taekwondo	141	99 928	1.91	1.80
Slovak Baseball Association	519	180 585	3.64	3.64
Slovak Basketball Association	3959	1 505 552	7.00	2.23
Slovak Boxing Association	205	157 243	2.00	3.55
Slovak Association of Petangue	21	31 785	1.05	0.26
Slovak Golf Association	280	353 662	6.46	21.21
Slovak Gymnastics Association	2615	1 441 755	5.60	5.60
Slovak Equestrian Association	486	143 998	1.81	1.32
Slovak Canoe Association	727	2 252 365	46.29	51.83
Slovak Lacrosse Association	18	31 785	2.21	2.21
Slovak Motorcycling Association	278	168 393	2.36	1.10
Slovak Muay-Thai Association	5	31 785	0.33	0.20
Slovak Association of Swimming Sports	3147	3 380 841	12.50	19.43
Slovak Rugby Association	108	31 785	0.78	0.20
Slovak Ski Mountaineering Association	18	31 785	1.27	0.40
Slovak Softball Association	271	56 980	1.97	0.20
Slovak Squash Association	8	31 785	0.96	0.29
Slovak Triathlon Association	335	366 278	12.05	7.39
Slovak Volleyball Association	8775	2 163 668	2.88	7.05
Slovak Athletics Association	9811	3 093 849	13.72	9.17
Slovak Association of Billiard Sports	66	35 087	0.51	0.73
Slovak Bowling Association	41	31 785	0.78	1.62

Slovak Bridge Association	48	31 785	2.36	0.87
Slovak Curling Association	22	53 330	3.88	0.20
Slovak Football Association	70020	12 909 778	16.8	9.4
Slovak Climbing and Mountaineering Association	1210	108 405	2.87	4.65
Slovak Skating Association	273	279 332	1.00	1.21
Slovak Archery Association	148	92 209	7.67	3.36
Slovak Air Sports Association	100	195 084	4.20	1.16
Slovak Speed-Skating Association	282	154 973	3.44	1.97
Slovak Table Tennis Association	1913	1 879 581	9.41	10.97
Slovak Shooting Sports Association	519	1 255 835	9.18	6.72
Slovak Chess Association	585	235 068	9.78	3.45
Slovak Fencing Association	150	193 821	0.66	5.88
Slovak Tennis Association	2909	4 603 877	18.57	16.22
Slovak Rowing Association	91	173 096	0.65	1.00
Slovak Wrestling Association	421	457 535	12.00	3.70
Slovak Badminton ssociation	575	294 802	2.69	1.66
Slovak Biathlon Association	333	590 585	6.80	7.92
Slovak Bobsleigh and Skeleton Association	61	117 892	0.41	2.40
Slovak Cycling Association	849	2 406 560	9.17	2.32
Slovak Minigolf Association	17	45 479	1.94	1.29
Slovak Floorball Association	3893	742 055	13.68	10.14
Slovak Handball Association	5525	2 490 972	5.36	4.34
Slovak Yachting Association	119	121 260	2.79	1.82
Slovak Judo Association	813	307 643	2.18	1.68
Slovak Karate Association	2481	816 176	4.01	9.28
Slovak Kickboxing Association	143	204 929	0.20	8.04
Slovak Ice-Hockey Association	7062	9 872 183	20.2	31
Slovak Association of Modern Pentathlon	92	146 524	0.60	2.43
Slovak Orienteering Sports Association	171	71 830	2.17	1.22
Slovak Hockey Association	134	201 727	1.36	0.20
Slovak Association of Sleddog Sports	65	51 634	2.26	0.20
Slovak Association of Fishing Technique	84	76 239	14.62	1.22
Slovak Luge Association	102	174 312	7.98	7.94

Slovak Sports Fishing Association	171	31 785	5.42	0.55
Slovak DanceSport Association	1847	476 173	3.26	1.36
Slovak Waterski and Wakeboard Association	79	80 351	6.99	4.06
Slovak Motonautique Association	44	31 785	2.39	2.26
Slovak Weightlifting Association	188	224 556	17.03	19.46
Slovak Darts Association	133	46 783	1.64	0.2
Slovak Underwater Sports Association	126	127 616	2.58	1.84

Source: The Ministry of Education, Science, Research and Sport of the Slovak Republic (from now on, MESRS): <https://www.minedu.sk/financovanie-sportu/>

Appendix 2: DEA models and their conditions used in the contribution

Input-oriented Charnes Cooper a Rhodes model (CCR-I model) that performs under constant return to scale (Charnes et al., 1978).

Let have optimisation problem of CCR- I model, the first phase of optimization task is:

$$\min_{\theta, \vec{\lambda}} = \theta_o$$

under conditions:

$$\theta \vec{x}_o \geq X \vec{\lambda}$$

$$Y \vec{\lambda} \geq \vec{y}_o$$

$$\vec{\lambda} \geq \vec{0}_{nx1}.$$

Then the second phase of optimization task is:

$$\max_{\vec{\lambda}, \vec{s}^-, \vec{s}^+} = \vec{e}' \vec{s}^- + \vec{e}' \vec{s}^+$$

under conditions:

$$\vec{s}^- = \vec{x}_o - \sum_{i=1}^n \lambda_i \vec{x}_i \geq \vec{0}_{mx1}$$

$$\vec{s}^+ = \sum_{i=1}^n \lambda_i \vec{y}_i - \vec{y}_o \geq \vec{0}_{sx1}$$

$$\vec{\lambda} \geq \vec{0}_{nx1}$$

Input-oriented Banker Charnes Cooper model (BCC-I model) that works under variable return to scale (Banker et al., 1984).

Its first phase of optimization task is:

$$\min_{\theta, \vec{\lambda}} = \theta_o$$

under conditions:

$$\theta \vec{x}_o \geq X \vec{\lambda}$$

$$Y \vec{\lambda} \geq \vec{y}_o$$

$$\vec{e}' \vec{\lambda} = 1, \vec{\lambda} \geq \vec{0}_{nx1}.$$

Then the second phase of optimisation task is:

$$\max_{\vec{\lambda}, \vec{s}^-, \vec{s}^+} = \vec{e}'\vec{s}^- + \vec{e}'\vec{s}^+$$

under conditions:

$$\vec{s}^- = \vec{x}_o - \sum_{i=1}^n \lambda_i \vec{x}_i \geq \vec{0}_{m \times 1}$$

$$\vec{s}^+ = \sum_{i=1}^n \lambda_i \vec{y}_i - \vec{y}_o \geq \vec{0}_{s \times 1}$$

$$\vec{e}'\vec{\lambda} = 1, \vec{\lambda} \geq \vec{0}_{n \times 1}.$$

Non-radial model under constant return to scale Slacked Based Measure model (SBM-I-C model) by Kaoru Tone (2001):

$$\min_{\vec{\lambda}, \vec{s}^-} \rho_o = 1 - \frac{1}{m} \sum_{i=1}^m \frac{s_i^-}{x_{io}}$$

under conditions:

$$\vec{s}^- = \vec{x}_o - \sum_{i=1}^n \lambda_i \vec{x}_i \geq \vec{0}_{m \times 1}$$

$$\vec{s}^+ = \sum_{i=1}^n \lambda_i \vec{y}_i - \vec{y}_o \geq \vec{0}_{s \times 1}$$

$$\vec{\lambda} \geq \vec{0}_{n \times 1}.$$

Non-radial model under constant return to scale Super- Slacked Based Measure model (Super-SBM-I-C model) to measure outliers by Kaoru Tone (2002) was applied:

$$\min_{\vec{\lambda}, \vec{s}^-} \rho_o = 1 - \frac{1}{m} \sum_{i=1}^m \frac{s_i^-}{x_{io}}$$

under conditions:

$$\vec{s}^- = \vec{x}_o - \sum_{i=1, i \neq o}^n \lambda_i \vec{x}_i \geq \vec{0}_{m \times 1}$$

$$\vec{s}^+ = \sum_{i=1}^n \lambda_i \vec{y}_i - \vec{y}_o \geq \vec{0}_{s \times 1}$$

$$\vec{\lambda} \geq \vec{0}_{n \times 1}.$$

In the case of non-radial model under variable return to scale Slacked Based Measure model (SBM-I-V model) was applied:

$$\min_{\vec{\lambda}, \vec{s}^-} \rho_o = 1 - \frac{1}{m} \sum_{i=1}^m \frac{s_i^-}{x_{io}}$$

under conditions:

$$\vec{s}^- = \vec{x}_o - \sum_{i=1}^n \lambda_i \vec{x}_i \geq \vec{0}_{m \times 1}$$

$$\vec{s}^+ = \sum_{i=1}^n \lambda_i \vec{y}_i - \vec{y}_o \geq \vec{0}_{sx1}$$

$$\vec{e}' \vec{\lambda} = 1, \vec{\lambda} \geq \vec{0}_{nx1}.$$

Non-radial model under variable return to scale Super-Slacked Based Measure model (Super-SBM-I-V model) by Kaoru Tone (2002) was applied to detect outliers:

$$\min_{\vec{\lambda}, \vec{s}^-} \rho_o = 1 - \frac{1}{m} \sum_{i=1}^m \frac{s_i^-}{x_{io}}$$

under conditions:

$$\vec{s}^- = \vec{x}_o - \sum_{i=1, i \neq o}^n \lambda_i \vec{x}_i \geq \vec{0}_{m \times 1}$$

$$\vec{s}^+ = \sum_{i=1}^n \lambda_i \vec{y}_i - \vec{y}_o \geq \vec{0}_{sx1}$$

$$\vec{e}' \vec{\lambda} = 1, \vec{\lambda} \geq \vec{0}_{nx1}.$$

Because for DMU_o when using a model of super efficiency, the assumption of convexity does not hold, the optimal solution for the super-efficient SBM model is $\rho_o^* \geq 1$.

Appendix 3: Technical efficiency of the Slovak national sports association – input-oriented DEA models

CR-I		BCC-I		SBM-C		SBM-V		SUPER SBM-C		SUPER SBM-V	
Slovak Korfball Association	1	Slovak Association of American Football	1	Slovak Korfball Association	1	Slovak Association of Bodybuilding and Fitness	1	Slovak Korfball Association	2.2143	Slovak Canoe Association	7.04853
Slovak Lacrosse Association	1	Slovak Association of The Chinese Wushu	1	Slovak Lacrosse Association	1	Slovak Frisbee Association	1	Slovak Sports Fishing Technique	1.37016	Slovak Korfball Association	2.23571
Slovak Curling Association	1	Slovak Association of Bodybuilding and Fitness	1	Slovak Curling Association	1	Slovak Korfball Association	1	Slovak Lacrosse Association	1.13598	Slovak Sports Fishing Technique	2.07596
Slovak Sports Fishing Technique	1	Slovak Frisbee Association	1	Slovak Sports Fishing Technique	1	Slovak Canoe Association	1	Slovak Curling Association	1.07669	Slovak Weightlifting Associations	1.90529
Slovak Weightlifting Associations	0.98168	Slovak Korfball Association	1	Slovak Weightlifting Associations	0.97359	Slovak Lacrosse Association	1	Slovak Weightlifting Associations	0.97359	Slovak Lacrosse Association	1.35168
Slovak Minigolf Association	0.82729	Slovak Baseball Association	1	Slovak Frisbee Association	0.73289	Slovak Muay-Thai Association	1	Slovak Frisbee Association	0.73289	Slovak Muay-Thai Association	1.3
Slovak Frisbee Association	0.75615	Slovak Association of Petangue	1	Slovak Minigolf Association	0.64859	Slovak Squash Association	1	Slovak Minigolf Association	0.64859	Slovak Curling Association	1.11274
Slovak Squash Association	0.75543	Slovak Canoe Association	1	Slovak Waterski and Wakeboard Association	0.61336	Slovak Curling Association	1	Slovak Waterski and Wakeboard Association	0.61336	Slovak Association of Bodybuilding and Fitness	1.08617
Slovak Waterski and Wakeboard Association	0.70521	Slovak Lacrosse Association	1	Slovak Golf Association	0.59531	Slovak Sports Fishing Technique	1	Slovak Golf Association	0.59531	Slovak Squash Association	1.06269
Slovak Golf Association	0.70454	Slovak Muay-Thai Association	1	Slovak Luge Association	0.5875	Slovak Weightlifting Association	1	Slovak Luge Association	0.5875	Slovak Frisbee Association	1.02274
Slovak Association of The Chinese Wushu	0.02956	Slovak Association of Swimming Sports	0.06623	Slovak Judo Association	0.02869	Slovak Cycling Association	0.04705	Slovak Judo Association	0.02869	Slovak Cycling Association	0.04705
Slovak Judo Association	0.02956	Slovak Table Tennis Association	0.05876	Slovak Association of The Chinese Wushu	0.02852	Slovak Karate Association	0.04417	Slovak Association of The Chinese Wushu	0.02852	Slovak Karate Association	0.04417
Slovak Gymnastics Association	0.02497	Slovak Karate Association	0.04743	Slovak DanceSport Association	0.02307	Slovak DanceSport Association	0.04238	Slovak DanceSport Association	0.02307	Slovak DanceSport Association	0.04238
Slovak DanceSport Association	0.02359	Slovak Athletics Association	0.03482	Slovak Gymnastics Association	0.02059	Slovak Gymnastics Association	0.02386	Slovak Gymnastics Association	0.02059	Slovak Gymnastics Association	0.02386
Slovak Basketball Association	0.01873	Slovak Gymnastics Association	0.02513	Slovak Basketball Association	0.01779	Slovak Athletics Association	0.02385	Slovak Basketball Association	0.01779	Slovak Athletics Association	0.02385
Slovak Athletics Association	0.01653	Slovak Basketball Association	0.02156	Slovak Athletics Association	0.0163	Slovak Basketball Association	0.02129	Slovak Athletics Association	0.0163	Slovak Basketball Association	0.02129
Slovak Volleyball Association	0.01122	Slovak Football Association	0.01631	Slovak Volleyball Association	0.01083	Slovak Volleyball Association	0.01238	Slovak Volleyball Association	0.01083	Slovak Volleyball Association	0.01238
Slovak Baseball Association	0.01065	Slovak Volleyball Association	0.01469	Slovak Baseball Association	0.00966	Slovak Baseball Association	0.01201	Slovak Baseball Association	0.00966	Slovak Baseball Association	0.01201
Slovak Football Association	0.00448	Slovak Baseball Association	0.01276	Slovak Football Association	0.0038	Slovak Football Association	0.00943	Slovak Football Association	0.0038	Slovak Football Association	0.00943

Note: The whole range of results can be obtained from the authors upon request.

Source: Authors' own, 2024

Appendix 4: A sample of the efficient and inefficient Slovak national sports associations

DEA model	Indicator	Slovak Korfball Association	Slovak Gymnastics Association	Slovak Basketball Association	Slovak Athletics Association	Slovak Volleyball Association	Slovak Baseball Association	Slovak Football Association
CCR-I	Data (I)AS	120	2615	3959	9811	8775	5525	70020
	Projection (I)AS	120	65	74	162	91	58	218
	Diff. (%) (I)AS	0	-97	-98	-98	-98	-98	-99
	Data (I)F	31785	1441755	1505552	3093849	2163668	2490972	12909778
	Projection (I)F	31785	35995	28205	51145	24267	26518	57805
	Diff. (%) (I)F	0	-97	-98	-98	-98	-98	-99
BCC-I	Data (I)AS	120	2615	3959	9811	8775	5525	70020
	Projection (I)AS	120	65	85	126	88	63	178
	Diff. (%) (I)AS	0	-97	-97	-98	-98	-98	-99
	Data (I)F	31785	1441755	1505552	3093849	2163668	2490972	12909778
	Projection (I)F	31785	36225	32462	107720	31785	31785	210571
	Diff. (%) (I)F	0	-97	-97	-96	-98	-98	-98
SBM-C	Data (I)AS	120	2615	3959	9811	8775	5525	70020
	Projection (I)AS	120	72	53	142	91	61	218
	Diff. (%) (I)AS	0	-97	-98	-98	-98	-98	-99
	Data (I)F	31785	1441755	1505552	3093849	2163668	2490972	12909778
	Projection (I)F	31785	19263	33334	56026	24267	20400	57805
	Diff. (%) (I)F	0	-98	-97	-98	-98	-99	-99
SBM-V	Data (I)AS	120	2615	3959	9811	8775	5525	70020
	Projection (I)AS	120	67	61	126	88	59	178
	Diff. (%) (I)AS	0	-97	-98	-98	-98	-98	-99
	Data (I)F	31785	1441755	1505552	3093849	2163668	2490972	12909778
	Projection (I)F	31785	31785	40821	107720	31785	33182	210571
	Diff. (%) (I)F	0	-97	-97	-96	-98	-98	-98

Source: Authors' own, 2024

Appendix 5: Summary of the outputs of interviews with experts

	Question	Summary of answers
1.	In the Slovak Republic, a new Act No. 440/2015 Coll. on Sport and Amendments to Certain Acts in Accordance with Later Regulations came into force on 1 January 2016 – what do you consider to be the most significant changes in the field of financing of national sports associations that this Act and other related legislative regulations have brought?	<i>Experts from the state administration</i> Guarantee of the amount of funding based on the fulfilment of parameters, mandatory publication of data by associations, and greater transparency of financing. <i>Experts from the sports associations</i> Increase in the volume of public funds and their claim ability and guarantee of the amount of funding, greater transparency in financing, transition to a more systematic management of sport in Slovakia
2.	In your opinion, the changes in question in the financing of associations have contributed to the improvement or deterioration of the fulfilment of public policy objectives in the field of sport and public interest in sport, and if so, in what specifically?	<i>Experts from the state administration</i> Overall, achieving public policy objectives in the field of sport has deteriorated, but the link with the new funding rules has not been demonstrated. <i>Experts from the sports associations</i> More public funds have improved the achievement of the objectives and allowed more activities to be developed, but the bureaucratic burden has increased.
3.	For which objectives has there been improvement, and for which has there been a deterioration?	<i>Experts from the state administration</i> Improvement: number of active sportspeople, medal awards Deterioration/stagnation: The population's sports activity. <i>Experts from the sports associations</i> Improvements: the number of members, the possibility of participating in several competitions, increasing the potential of medal awards, and implementing a larger number of association projects. There was no deterioration.
4.	In your opinion, are the new conditions for obtaining and drawing public funds more administratively demanding for national sports associations, and if so, in what specifically?	<i>Experts from the state administration</i> Yes, especially regarding reporting and meeting the conditions for the provision and use of public funds. <i>Experts from the sports associations</i> Yes, bureaucratic complexity has increased, and the state has yet to finalise many processes and systems (e.g. the Sports Information System) have still not been finalised by the state.
5.	Do you consider the new method and setting of the redistribution of funds in the form of a contribution to a recognised sport to be fair from the point of view of achieving the goals of public policy in the field of sport by individual national sports associations?	<i>Experts from the state administration</i> Partially, distortions in redistribution are caused by the system of financial brakes and the lack of "value for money" in sports; however, largely subjective criteria in the redistribution of public funds have been eliminated. <i>Experts from the sports associations</i> In general, the new system of financing sports can be considered fair, but to increase fairness, it would be advisable to automate the system more and depoliticise it as much as possible.
6.	Do you consider the new method and setting of the redistribution of funds in the form of a contribution to recognised sport to be fairer from the point of view of achieving the goals of public policy in the field of sport by individual national sports associations compared to the previous system?	<i>Experts from the state administration</i> No improvement - the formula for redistributing the amount of the contribution does not differ from the original formula in principle; the financial brakes and some input data for averaging sports achievements have been adjusted. However, the formula, as such, contains the same parameters – the number of sportspeople, interest in sports, and the like; the brake system made it worse – they are set very loosely and provide an excessive advantage to associations without results. Fixation for Football and Ice Hockey is also problematic. <i>Experts from the sports associations</i> In principle, it is fairer – without further specification.
7.	In what ways do you think the new system is fairer, or in what ways is it less fair?	<i>Experts from the state administration</i> It is fairer in that it guarantees a certain allocated amount for recognised sports; it is less fair in the system of brakes and fixations of the contribution by the two most significant associations. Overall, however, it cannot be described as fairer than the original system. <i>Experts from the sports associations</i> It is fairer mainly due to claim ability, financing guarantees and a lower degree of subjective intervention.
8.	Do you consider the new method and setting of the redistribution of funds in the form of a contribution to recognised sport for national	<i>Experts from the state administration</i> It is fairer in that it guarantees a certain allocated amount for recognised sports; it is less fair in the system of brakes and fixations

	sports associations to be motivating or demotivating for associations, and in what specific way?	of the contribution by the two most significant associations. Overall, however, it cannot be described as fairer than the original system. <i>Experts from the sports associations</i> It is fairer mainly due to claim ability, financing guarantees and a lower degree of subjective intervention.
9.	Do you consider the new method and setting of the redistribution of funds in the form of a contribution to a recognised sport for national sports associations to be more motivating compared to the originally valid system valid until the adoption of the new Sports Act – if so, or not, in what precisely?	<i>Experts from the state administration</i> No, the brakes in the original system could drop earlier, counting the placement, and there was no fixation for Football and Ice Hockey. <i>Experts from the sports associations</i> It is impossible to clearly describe the new system as more motivating, as it has retained many characteristics of the original redistribution of funds; the volume of funds provided has increased, but the administrative complexity has also increased.
10.	In your opinion, to improve the fulfilment of public policy objectives in the field of sport, is it necessary to legislate in financing national sports associations and, if so, in what specific ways and which factors/specifcs/instruments could potentially contribute to improving the fulfilment of the public interest in sport?	<i>Experts from the state administration</i> It would be appropriate to adjust the system to increase motivation and competition between individual associations. Introduce a system of benchmarks and identification of the benefits of individual sports for the public, the achievement of which would be directly linked to the financing of associations. It would also be appropriate to adjust the entire sports programme financing so that the system and resource allocation would reflect the state's most important goals. <i>Experts from the sports associations</i> It would be appropriate to liberalise the possibilities of using the contribution of recognised sports further and focus more on the needs of sport as such and the results achieved.

Source: authors’ own, 2024