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APPLICATION OF PORTFOLIO MATRIX FOR RESOURCE ALLOCATION PURPOSES IN SPORTS: THE CASE OF HUNGARY

ZASTOSOWANIE ANALIZY MACIERZY PORTFELOWEJ W CELU ALOKACJI ŚRODKÓW W SPORCIE: ANALIZA NA PRZYKŁADZIE WĘGIER

Márk Hoffbauer[1(E)], **Pongrác Ács**[1(E)], **Miklós Stocker**[2(E)], **Dávid Paár**[1(E)]

[1]Faculty of Health Sciences, University of Pécs, Hungary
[2]Department of Business Studies, Corvinus University of Budapest, Hungary

Authors' contribution
Wkład autorów:
A. Study design/planning
zaplanowanie badań
B. Data collection/entry
zebranie danych
C. Data analysis/statistics
dane – analiza i statystyki
D. Data interpretation
interpretacja danych
E. Preparation of manuscript
przygotowanie artykułu
F. Literature analysis/search
wyszukiwanie i analiza literatury
G. Funds collection
zebranie funduszy

Summary

Background. Sports can function in a number of contexts in society, therefore government-related financial contribution can be justified. The resource allocation decisions of the contributor are always a relevant topic. The aim of this paper was to create a modified portfolio matrix tool for resource allocation purposes, which can be used at the national, regional, municipal or organizational level.
Material and methods. The study consists of two researches conducted with the use of Google Forms. Two target groups (sports clubs from Baranya County and outstanding sports clubs in Hungary) were taken into consideration.
Results. During the interviews in each group of sports clubs, 40 and 52 sports respectively were evaluated. The 12 most important sports were selected for this study. It can be seen that there is no significant difference between the regional and national rankings of sports. Outstanding sports clubs evaluated the given sports higher overall than regional sports clubs with regard to both categories: "the future vision of sport" and "the current impact".
Conclusions. The sport portfolio matrix can serve as the basis for the resource allocation decisions, but it has to be complemented with other funding schemes as this tool incentivizes mostly present performance, whereas strategic considerations should have another platform.
Keywords: sports portfolio matrix, Hungarian sport system, sports economics, sports evaluation, resource allocation

Streszczenie

Wprowadzenie. Sport może funkcjonować w wielu kontekstach w społeczeństwie, dlatego wkład finansowy pochodzący od organów rządowych może mieć swoje uzasadnienie. Decyzje dotyczące alokacji zasobów przez podmiot wnoszący wkład są zawsze istotną kwestią. Celem niniejszej pracy było stworzenie zmodyfikowanego narzędzia macierzy portfelowej w celu alokacji środków, które może być stosowane na poziomie krajowym, regionalnym, miejskim lub organizacyjnym.
Materiał i metody. Niniejsza praca składa się z dwóch badań, przeprowadzonych z wykorzystaniem Google Forms. Uwzględniono dwie grupy docelowe (kluby sportowe komitatu Baranyi oraz wyróżniające się kluby sportowe na Węgrzech).
Wyniki. W wywiadach w poszczególnych grupach klubów sportowych, oceniono odpowiednio 40 i 52 dyscypliny sportowe. Do celów niniejszej pracy wybrano 12 najważniejszych. Można zauważyć, że nie ma znaczącej różnicy pomiędzy rankingiem sportów na poziomie regionalnym i krajowym. Kluby sportowe o wybitnych osiągnięciach oceniły dane dyscypliny sportowe ogólnie wyżej niż regionalne kluby sportowe w obu kategoriach: „wizja przyszłości sportu" oraz „bieżący wpływ".
Wnioski. Macierz portfelowa w sporcie może służyć jako podstawa do podejmowania decyzji o alokacji środków, ale musi być uzupełniona o inne systemy finansowania, ponieważ narzędzie to opiera się głównie na obecnych wynikach, podczas gdy względy strategiczne powinny wykorzystywać inną platformę.
Słowa kluczowe: macierz portfelowa w sporcie, węgierski system sportowy, ekonomia sportu, ocena sportu, alokacja zasobów

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Address for correspondence / Adres korespondencyjny: Márk Hoffbauer, Faculty of Health Sciences, University of Pécs, Vörösmarty M. str 4, H-7621 Pécs, Hungary, e-mail: hoffbauermark@gmail.com, phone: +36-72/535-980
ORICD: Márk Hoffbauer https://orcid.org/0000-0002-0042-6007, Pongrác Ács https://orcid.org/0000-0002-4999-7345, Miklós Stocker https://orcid.org/0000-0003-2670-6717, Dávid Paár https://orcid.org/0000-0002-4643-933X

Introduction

Physical activity has a very important role in health and in economy [1]. The economic burden of physical inactivity is measured in billions (HUF) per year in Hungary [2]. Some researchers focus on consumption models when measuring sport spending [3-5], while others would like to show the values of sports or the economic side [6]. Gulyás and Sterbenz [7] pointed out that in the Hungarian sport financing system, the most important financing comes from the tax relief system (TRS) for five sports and the funding program of the sixteen prioritized Olympic sports. Gősi and Bukta [8] also examined the sixteen prioritized sports funding, and they established that the total revenue of the associations has increased several times and that the assets also show an increase. Gulyás [9] showed the relationship of the competitiveness of the top sports in Hungary and the efficiency of state financing. Other authors likewise explore the linear relationship between public financial resource and Olympic results [10,11].

Financial distribution in sports based on the value of sports has been explored by few researchers. The values in sports can be very broad, however. According to Groll et al. [12], tradition is one of the most important elements of sports. Varmus et al. [13] wrote about the importance of popularity of sports. Nagy and Tobák [14] show the importance and role of sports infrastructure. Ács et al. [1,2,15-17] emphasize the importance of physical activity with the key figure being the number of active sports consumers. Stensaasen [18] writes about the role of the number of passive sports consumers. Dohery [19] draws attention to the importance of human resources in the field of sports.

As there can be several different approaches, and most of them seem to focus on a few important elements, we selected a tool that allows the evaluation of several aspects in a complex way. In corporate strategy of resource allocation, situations are often analyzed with portfolio matrices. According to Udo-Imeh et al. [20], Boston Consulting Group's (BCG) growth-share matrix, General Electric's industry-attractiveness matrix, Shell's directional policy matrix, and Arthur D. Little's strategic condition matrix can serve this purpose. Portfolio matrices can be used in the non-profit sphere as well. Rynca [21] suggests to use BCG matrix to manage a university, while Vignali [22] advises to use the growth-share matrix in sponsorship in sports. Gholipour et al. [23] examined even the needs of the Iranian Premier League fans with the BCG matrix. There is a research gap, though, regarding a complex portfolio-based tool for state financing in sports. Nowadays the state financing system takes into account a lot of different indicators in several sub-systems to provide sports with financial aid, so the sport portfolio matrix could be a complex tool for governmental policy makers.

The aim of the paper is to present how to use a modified portfolio matrix for resource allocation in sports at a national, regional or organizational level, based on the literature. With respect to resource allocation, the study by Dittmore et al. [24] about the importance of Fairness Perceptions of Financial Resource Allocations based on U.S. Olympic sports was taken into consideration. McKinsey's GE matrix [25] provided basis for our analysis, although the dimensions were altered due to the characteristics of sports and sports financing in Hungary. The Hungarian sport governance system was the empirical basis for the study.

Material and methods

For this research, the survey method was selected to obtain primary data with the computer-assisted personal interview technique. The survey respondents were highly positioned experts in their fields. The research consisted of two phases, one regional and one nation-wide.

In the first phase, the research focused on significant sports clubs in Baranya County, Hungary, which involved 8 sports clubs representing more than 10,000 athletes and more than 40 different sports. The spatial scope of the first research was determined based on the primary enrolment area of the University of Pécs (as the base of

the research). Each of the involved sport associations has at least 5 divisions, with a minimum of 250 athletes. The surveys were filled during an interview conducted by a member of the research team, and the interviewed experts had an average of 14.5 years of sport management experience. Forty sports were covered, including: aerobics, archery, athletics, badminton, basketball (men's basketball and women's basketball), boxing, chess, cycling, dance sport, dragon ship, equestrianism, fencing, futsal, golf, gymnastics, handball, ice hockey, judo, karate, kayak-canoe, kick-boxing, modern pentathlon, rowing, scuba diving, skydiving, soccer, sport shooting, surfing, swimming, synchronized swimming, table tennis, taekwondo, tennis, triathlon, volleyball, water polo, weightlifting, and wrestling. The questionnaire had 3 main parts. The first part consisted of the demographic- and experience-related questions regarding the respondents. The second part contained the questions about the future vision of the examined sports in the region, including the questions about tradition, popularity of the sport around the world, popularity in the region, infrastructure, active consumers, passive consumers, human resources, and financial resources. The questions could be answered on a three-level scale (poor/limited, medium, excellent), with the options of "do not know" or "cannot judge". The third part of the questionnaire focused on the current impact of the examined sport, such as the quality of youth athletes, number of youth athletes, quality of senior athletes, and number of senior athletes in the given region. The questions could be answered on a three-level scale.

In the second phase, outstanding sports clubs were surveyed (the Hungarian government appointed 7 sports clubs from Budapest and 17 from other cities into its outstanding sports clubs program). The reason for selecting the outstanding sports clubs was that most of the examined sports are present in these associations, and their leaders have wide knowledge of the domestic sports scene. The survey had to be adjusted slightly due to national coverage, which meant minor category changes and the inclusion of 12 new sports (American football, biathlon, bowling, curling, darts, figure skating, orienteering, parasport, pétanque, rugby, ski sports (alpine skiing, ski jumping, cross country skiing) and speed skating. The representatives of 14 out of 24 outstanding sports clubs filled in the questionnaire.

To construct the portfolio matrix, we created two dimensions from the answers to the questionnaire: the answers related to the future vision of sports formed the vertical axis, and the answers related the current impact of sports formed the horizontal axis. The questions related to the future vision dimension were weighted. Aspects such as tradition, recognition in the world, recognition in the region, and infrastructure had a weight of *0.1; active and passive sports consumers, and human and financial resources had a weight of *0.15. The current impact dimension was weighted as well, in such a way that the quantity, and youth and senior athletes had a weight of *0.2, the quality of youth athletes had a weight of *0.25, and the quality of adult athletes had a weight of *0.35.

Results

The results of the expert interviews from the two phases are compared with each other in Table 1. During the interviews, there were 40 and 52 sports respectively evaluated. Because many sports had same results in the surveys, the 12 most important sports (that were evaluated in both phases) were selected for the analysis: archery, athletics, cycling, boxing, fencing, futsal, handball, judo, modern pentathlon, soccer, surfing and table tennis.

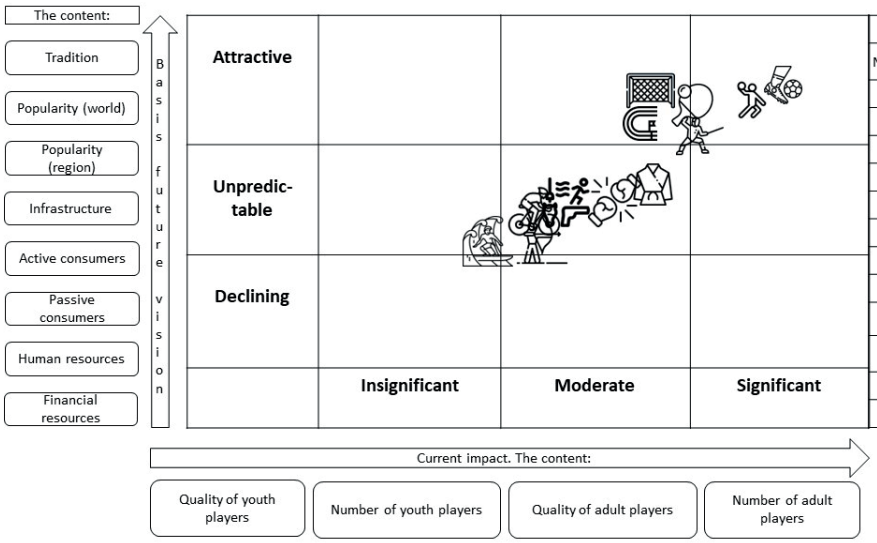
Table 1. Future vision and current impact of the selected sports

Sports clubs in Baranya County				Outstanding Sports Clubs			
Position	**Sport**	**Future vision**	**Current impact**	**Position**	**Sport**	**Future vision**	**Current impact**
1.	Soccer	2.538	2.406	1.	Soccer	2.779	2.708
2.	Handball	2.441	2.369	2.	Handball	2.550	2.451
3.	Table tennis	2.031	2.356	3.	Athletics	2.532	2.479
4.	Fencing	2.005	2.136	4.	Futsal	2.435	1.804
5.	Futsal	1.927	1.506	5.	Table tennis	2.108	2.052
6.	Athletics	1.895	2.171	6.	Fencing	2.105	2.327
7.	Judo	1.732	1.575	7.	Judo	2.087	2.138
8.	Boxing	1.682	1.529	8.	Boxing	1.903	1.735
9.	Modern pentathlon	1.531	1.240	9.	Cycling	1.866	1.696
10.	Cycling	1.458	1.232	10.	Modern pentathlon	1.761	1.757
11.	Archery	1.379	1.129	11.	Archery	1.438	1.480
12.	Surfing	1.253	1.000	12.	Surfing	1.138	1.000

It can be seen that there is no significant difference in the rankings at the regional and national level. Outstanding sports clubs evaluated the given sports higher overall than regional sports clubs with regard to both, the future vision of sport and the current impact.

The selected sports were included in the research because of their importance in Hungary. Among the sports presented in the sample, according to the government schedule, 3 team sports (soccer, handball, futsal) and 7 individual sports belong to the priority category, while surfing and archery belong to the catch-up category. Soccer is the most-watched and popular sport in Hungary as well as in almost the entire world. In terms of handball, the top teams in Hungary are among the best in the world (both men's and women's). Futsal is a sport that is constantly developing and is an important part of mass sports. Among the seven highlighted individual sports, athletics was chosen because of its popularity in the world, while fencing was included in the sample because of its 38 Olympic gold medals for Hungary. The previous outstanding results of table tennis, modern pentathlon, and boxing made them also included in the research. Judo and cycling came into focus as up-and-coming sports with increasing popularity and better results. Archery and surfing, although less popular in Hungary, were included in the research because they are Olympic sports as well.

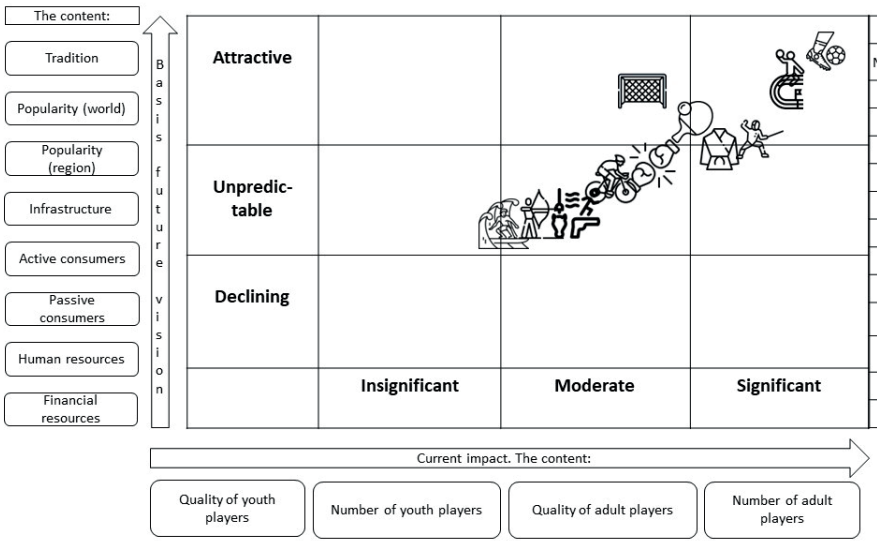
According to these results, the different sports can be included in the sports portfolio matrix, which can be seen in Figure 1 and Figure 2.



Research of Sport clubs in Baranya County

Number	Sport	Basis future vision	Current impact
1.	Soccer	2.538	2.406
2.	Handball	2.441	2.369
3.	Table tennis	2.031	2.356
4.	Fencing	2.005	2.136
5.	Futsal	1.927	1.506
6.	Athletic	1.895	2.171
7.	Judo	1.732	1.575
8.	Box	1.682	1.529
9.	Penthatlon	1.531	1.240
10.	Bicylce	1.458	1.232
11.	Archery	1.379	1.129
12.	Surf	1.253	1.000

Figure 1. Sports portfolio matrix of Baranya County, Hungary



Research of Outstanding Sport Clubs

Number	Sport	Basis future vision	Current impact
1.	Soccer	2.779	2.708
2.	Handball	2.550	2.451
3.	Athletics	2.532	2.479
4.	Futsal	2.435	1.804
5.	Table tennis	2.108	2.052
6.	Fencing	2.105	2.327
7.	Judo	2.087	2.138
8.	Boxing	1.903	1.735
9.	Cycling	1.866	1.696
10.	Modern pentathlon	1.761	1.757
11.	Archery	1.438	1.480
12.	Surfing	1.138	1

Figure 2. Sports portfolio matrix in Hungary from the viewpoint of outstanding sports clubs

According to Figure 1, it can be seen that soccer is the most valuable sport (among the 12 included in the study). This sport scored the highest in terms of the future vision and its current impact. If we compare this result with the current position of Baranya County's place on the Hungarian soccer map, we have to notice that this is a very positive evaluation. The County does not have a first-league club, but it has 3 teams in the second league. The high values of handball are also a very positive scenario, because the County has only one first-league club. Pécs, which is the biggest city in the region, has only male teams in the third league. Table tennis, fencing, and judo have also good international results. The position of these sports is parallel with their results in the interviews. If we take a look at the sports holding the last positions in the ranking, it can be assumed that the position of cycling is weak; however, it has a lot of potential, because 3 new clubs have been established in Baranya County in recent years. Unfortunately, archery is becoming less and less popular, and it is increasingly being taken over by equestrian archery (mounted archery), primarily for the purpose of preserving tradition. The low values of surfing are mainly due to the fact that there are very few water surfaces in Baranya Country suitable to surf.

According to Figure 2, it can be concluded that soccer is the most valuable sport (among the 12 sports included in the study). This sport scored the highest in terms of the future vision and its current impact. The contributory factors to this value are the traditions of soccer in Hungary, the tax relief system (TRS), and the recent results (Ferencváros soccer club, and the National Team). Handball, the second in the ranking, has also very good club results, and national youth team results. The most important difference between the research in Baranya County and the outstanding sports clubs is the place of athletics. While the value for the future vison is less than 2 in Baranya County, this number is higher than 2.5 in the research of outstanding sports clubs. Presumably, this is due to the fact that there are few athletes in Baranya County, in few clubs, with a medium level of infrastructure, while there has been greater development at the national level. It is also similar in case of the future vision of futsal. It is considered equally important by both groups, both view its current position to be low, which can be explained by the few players and the nature of the sport as a mass sport. The evaluation of other sports is similar in both groups.

Determining the value of different sports is an important stage of the research, but it is not the end point. In our opinion, this research offers many possibilities for application in different fields, such as the economic and distribution possibilities, which we would like to present in detail, through examples. The presented examples can be applied at the governmental, municipal, and regional level.

Discussion

With the help of the matrix, the regional/national evaluation of each sport is possible, which in turn can be the basis for the resource allocation decisions. It is worth noting that supporting only the upper right segment would be a serious mistake. The sport portfolio matrix serves as a performance measurement tool. Strong-performing sports have to be prioritized in funding decisions, but sports with actual low values can be selected strategically and funded to enable them to become significant in the future. Therefore, this tool should only be used in the resource allocation of competitive sports, and other resource allocation mechanisms should be applied to developmental and health-related sports, etc.

To demonstrate the use of the sports portfolio matrix, the example of Hungarian government's resource allocation will be shown. As presented in Figure 3, the Hungarian government is going to spend around 141 million EUR on competitive sports in 2022 [26]. Table 2 shows how resource allocation can be determined using the sports portfolio matrix.

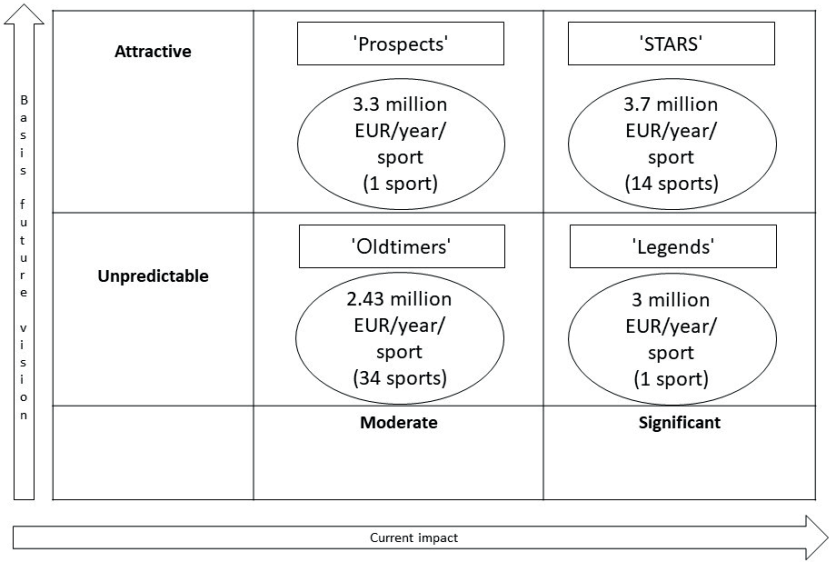


Figure 3. Sport financial resource allocation by sports portfolio matrix

Table 2. Example 2 for sport financial resource allocation by sport portfolio matrix (data for outstanding sports clubs)

Sport	Future vision	Current impact	Average	%	Suggested aid (million EUR)
Soccer	2.779	2.708	2.743	3.02%	4,270
Handball	2.550	2.451	2.501	2.75%	3,892
Athletics	2.532	2.479	2.505	2.76%	3,900
Table tennis	2.779	2.708	2.743	3.02%	4,270
Fencing	2.105	2.327	2.216	2.44%	3,449
Boxing	1.903	1.735	1.819	2.00%	2,831
Cycling	1.866	1.696	1.781	1.96%	2,772
Modern Pentathlon	1.761	1.757	1.759	1.94%	2,738
Archery	1.438	1.480	1.459	1.61%	2,271
Surfing	1.138	1.000	1.069	1.18%	1,664

Figure 3 presents one of the possible distribution methods of the 2022 competitive sports subsidy based on the 50 sports included in the research (the data come from the research of outstanding sports clubs). The distribution example divides sports into four categories based on their sports portfolio matrix value. The "STARS" category contains soccer, basketball, athletics, handball, etc. We can conclude that these sports have a lot of supporters (S), they have traditions (T), they are also available for people (A), they have a lot of results (R), and most of them are symbols, or the sportsmen are symbols (S). We named this section "STARS". Only gymnastics is in the significant and unpredictable future category in our research, and some sports are near to this (table tennis, fencing, karate, judo). What these sports have in common is that they are individual sports, their income-generating capacity is very low, and their traditions go back a long time. Our suggested name for this category is: "Legends". The biggest category is the mix of moderate current impact and unpredictable future, with 34 sports. These sports' future vision and current impact is medium or low. Most sports build on past results in this category and need a renewal, so our suggestion for the name of this category is: "Oldtimers". The last category is the mix of moderate current impact and attractive future vision. In our research, only futsal goes in this category. Our suggestion for the category's name is: "Prospects".

According to Table 2, it can be seen how the 141 million Euro is divided between the competitive sports. The table contains only the chosen 10 sports, but the calculation includes all 52 sports participating in the research. The methodology is based on averaging the value of the future vision and the current impact. After averaging, the combined value of each sport is given as a percentage. The total competitive sports subsidy amount is projected onto the percentage value. Using percentage-based differentiation, categorization can be avoided. A significant advantage of this method compared to the division presented in the previous figure is that it does not average the individual sports, but rewards them based on their own value. Compared to what is shown in Figure 3, we can conclude that soccer would receive more than half a million Euros in support, while surfing would receive 0.8 million Euros less. The examples clearly illustrate that the methodology can provide multiple distribution proposals. These suggestions may be added to the national, regional and municipal sports strategies. Thanks to the pre-cleared distribution methodology, it will be clear for the sports at the national and local level how much support they can expect. Based on a clear distribution methodology, individual sports can also develop their own medium and long-term strategy.

Conclusions

The sports portfolio matrix can be used as a performance measurement tool which makes it possible to evaluate sports even at the national level. The use of the sports portfolio matrix may serve as the basis for the resource allocation decisions, but it has to be complemented with other funding schemes, as this tool is

incentivizing mostly present performance, and strategic considerations should have another platform. We recommend the application of the sports portfolio matrix in practice for decision makers and from their feedback we plan to come up with refinements at both levels of analysis. Due to the experience and corrections gained in this way, the matrix can fulfil its original purpose and become part of the national sports financing methodology.

The limitation of the study is that it is focused only on Hungary. In the future, comparative analysis could be done with other countries to develop the robustness of the method.

Future research directions can be the refinement of the results, including national sport associations and those outstanding sports clubs which missed the survey deadline. A new future research direction may be resource allocation at the city level, using the tool with the sports clubs of the given city and its competitive related sport budget.

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