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Multi-criteria Evaluation of the State of Professional Theatres in the Czech Republic in Terms of Mixed Public Goods Provided to the Citizens

Eva Ardielli, Jiří Bečica¹

Abstract: The provision of public goods is an important aspect of public sector management, and it is a subject of specific conditions. Public Goods should be provided efficiently and in accordance to consumer demand and should meet the provider's political and financial priorities as well as other obligatory commitments. An important role also play the citizens that are increasingly appealing on the provision of high-quality, accessible and cost-effective public goods in line with the principle of “value for money”. The evaluation of the provided public goods is, therefore, a topical issue. A particular case would be the provision of mixed public goods. This article deals with the topic of evaluation of mixed public goods provided in the cultural sector, specifically in the field of theatres. The basis of the economic value of cultural goods (products) and services is their rarity and utility value. Major difficulties are associated with the evaluation of freely available cultural goods or cultural services provided for non-equivalent admissions. Cultural goods often are of a high spiritual value in the eyes of the public, but, at the same time, their financial value is low. The aim of the paper is to evaluate the level of mixed public goods provided by Czech professional theatres from the perspective of technical and financial availability to citizens. For the assessment of the level of provided cultural goods, the multi-criteria evaluation method WSA is used. In terms of technical and financial aspects, the results of the research demonstrate a great variability across organizations associated in the Professional Theatres Association. The organizations are ranked according to the level of provided mixed public goods from best to worst.

Key words: Assessment, public goods, professional theatres, WSA method

JEL Classification: H41, Z11, Z18

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Introduction

Culture does not only represent our history; it also is the present and the future. According to the State Cultural Policy (Ministry of Culture of the Czech Republic), culture is the Czech Republic's "Ticket to the Future" (MKČR, 2015). Culture is one of the collective public goods where the developed state has a great interest in the production and consumption; however, this does not immediately decide the scale and structure of these goods. The main goal of culture is to cultivate and educate. Some of the costs for the acquisition of cultural goods come directly from citizens and consumers and the rest is paid from the budget of state or local self-governing units.

The subject of the article is the evaluation of public goods with collective consumption at the level of professional theatres operating in the Association of Professional Theatres in the Czech Republic, i.e. at the level of the cultural and creative industries (CCIs). Žáková (2017) also includes in the CCIs architecture, design, digital games, film, music, books and print, fashion, monuments, advertising, software, TV and radio, arts and crafts.

The aim of the paper is to evaluate the level of provided mixed public goods (with a link to the financing of these goods) in the theatre field in the Czech Republic. The reason to research the issue of public goods in the field of scenic art lies in the finding (which is a typical common feature of most of the collectively provided public goods) that the market is unable to efficiently ensure the production of these goods without the intervention of the state or territorial self-government.

1. Concept of Public Goods

From theoretical point of view, public goods are products that are difficult to keep from consumption by nonpayers (non-excludability), and of which anyone can consume as much as desired without reducing the amount available for others (non-rival consumption). The sub-categories of public are public service and public good (product). In economic literature, the issue of consumption of public goods was first mentioned in the works of Pareto and Schiavier (1927). The first definition of public goods is attributed to P. A. Samuelson (1954) and is based on the postulate of economic goods divided into private and public. Public goods are then categorized as pure or mixed, arguing with the principle of consumption or the conditions of non-rival consumption and non-excludability from the consumption of a given public good.

The concept of public goods by Samuelson is followed by other authors, especially Musgrave (1959), who extended the issue with the perspective of financing from public budgets. According to this view (with which the authors of this article identify), among public goods (both pure and mixed) can be ranked those public services and public goods (products) which are financed entirely or partially through the allocation function of public budgets (in the Czech Republic it is the budget of the state, region or municipality), regardless on their provider, which may be both private and public. Similarly, this issue is dealt with by Ochraňa et al. (2007).

The issue of public goods (especially public services) is broached by many authors, as can be encountered in works such as Arrow (1963), Pollitt (1993), Samuelson, Nordhaus (2010), Stiglitz and Rosengard (2015). For example, according to Stiglitz

(1997), the imbalances in market provision are the result of private companies failing to pursue their narrow interests, mostly seeking to just maximize profits for their owners that do not benefit the society as a whole.

A view of the institutional nature is tackled by Bénard (1990) in the context of the questions: "how the services are provided to the society" and whether "there is a demand for payment of the market price or if the goods are provided free of charge". The goods are divided into market, semi-market and non-market. Musgrave and Musgraveová (1994) state: "If we say that public goods are secured publicly, we mean that they are covered by the budget and are available free of charge to individual consumers. How they are produced does not play a role." Řežuchová (2010) adds that the provision of public services covers a wider importance in the sense of guaranteeing, organizing, regulating, controlling and financing of a specific public service. In terms of public services, benchmarking is an example of one of the methods for performance evaluation of organizations, which, according to Nenadál et al. (2008), is defined as a continuous process of measuring of products, services, procedures and methods with the largest competitors on the market respectively with those businesses and institutions that have a leading position in the given area.

2. Problem Descriptions

According to Vrabková et al. (2017) or Varadzin and Bečica (2016), the provision of public goods (products) and services with collective consumption tends to be inefficient. This inefficiency is usually the result of the market overhang on the supply side and an unbalanced (insufficient) number of inquiring on the demand side. In the culture sector, however, this imbalance in the market cannot be simply solved by e.g. reduction of the capacity of the theatre auditoriums, concert halls, exhibition space or exhibited objects and in-store objects. If we want to preserve the historical identity and spatial availability of cultural goods and services for present and future generations, it is necessary to support them through the founder, i.e. a public budget at state level or local government (Musgrave, 1959). According to Potůček et al. (2005), the allocation of funds from public budgets depends on the limited financial resources and the actual political representation, where the goal is the economic, efficient and effective functioning of publicly established institutions that provide public goods and services, including cultural goods and services.

Nonetheless, theatre is a private good, rival and exclusive, which is due to political decision-making subsidized on the basis of ad hoc decision-making by political power holders, usually city councillors, as cities and municipalities are the most frequent founders of theatres in the Czech Republic. Due to the long-term compliance of elected representatives of political power at local, regional and state level in ensuring of the operation of evaluated theatres and their predominant financing from public budgets (due to their lack of financial self-sufficiency, see Vrabková et al. (2017, p. 116), it is, in fact, the provision of publicly provided goods.

Given the above, the professional theatres in the Czech Republic chosen for this article are ranked among the providers of mixed public goods (goods and services) because

their funding is primarily realized through the public budget. The founders of most of the evaluated theatres are the municipalities or the regions (Těšínské divadlo in Český Těšín, Horácké divadlo in Jihlava) or the state (Národní divadlo – the National Theatre in Prague). In this article, the professional theatres are evaluated using a multi-criteria analysis including indicators of both the provided mixed public goods and indicators describing the material and technical costs necessary for the provision of mixed public goods.

3. Specifics of Czech Theatres

In legal terms of theatres' existence in the Czech Republic as economic units, most theatres have the status of the so-called contributory organizations (of the state, regions, municipalities). However, there also are private theatres (civic associations, public service companies) and business theatres. Contributory organizations have been operating in the Czech Republic for about 60 years. Their origins date back to the middle of the 20th century and are associated with the pre-1989 socialist government of the Czechoslovak Socialist Republic. The legislation of the contributory organizations followed the form of formerly traditional public law institutes of public law (Telec, 1998).

Activities carried out in the Czech Republic by contributory organizations of state, regions or municipalities are in other European countries performed by similarly conceived institutions of non-profit nature, also with legal personality and public funding links with the public founder. Such organizations in France, Austria or Germany most often are established as public institutions and operate particularly in the fields of health, education or culture (theatres, museums, galleries, libraries); for more information see Lovětínský and Mylková (2011). Contributory organizations that engage in cultural activities in the Czech Republic are not primarily profit-oriented (as they should not be) but are predominantly determined to the satisfaction of cultural needs and the preservation of cultural identity. The budget of the contributory organization needs to be compiled as balanced and the difference between budgeted revenues and budgeted costs is covered by the funds of the founder (i.e. state, region or municipality) in the form of a contribution to the operation following the founder's defined performances or other criteria.

The paper evaluates professional theatres established by local government in particular. Municipalities and regions set up contributory organizations pursuant to Section 35a of Act No. 128/2000 Coll., On Municipalities and to Section 14 of Act No. 129/2000 Coll., On Regions, in order to meet the needs of the population, which is related to the independent competence of the territorial self-government. This includes, amongst other things, the area of cultural development (Morávek and Prokúpková, 2015). In 2015, theatrical activities in the Czech Republic were performed by 155 theatres, which managed 180 permanent theatre scenes. As for the total number of organizations, theatres established by private and legal persons prevail in the Czech Republic (about 2/3 of the total number). The largest concentration of private theatres is in large cities, especially in and around Prague (NIPOS, 2018). Under evaluated organization (established by the state, regions or municipalities) which are members of the Association of Professional Theatres in the Czech Republic, are only 28 organizations, but they manage 56 permanent scenes and their seat capacity is 45% (18,676 seats) of the total seating capacity

operated by permanent theatre scenes in the Czech Republic. From a geographic perspective, the article lists the 28 theatres according to the country's region they belong in: Prague and the South Moravian Region (each with 4 theatres), the Moravian-Silesian Region (3 theatres each), the Regions of Zlín, Olomouc, Hradec Králové, Liberec, and Plzeň, the Central Bohemian Region and the Region of Vysočina (2 theatres each). The other regions have one theatre each listed.

4. Assessment of Public Goods and Public Services

The evaluation and measurement of organizations providing comparable public goods and public services to the population is relatively common. Ochrana et al. (2007) states that the provision of public services is often associated with externalities and inefficiency in the spending of public funds. This inefficiency then leads to a lack of resources and a reduction of the services provided (Hampl, 2001). The organizations providing public goods and public services in Finland were evaluated by, for example, Jämskeläinen (2010). Within the Czech Republic, similar assessments were undertaken, for example, in the transport enterprises of selected cities (Klieštík, 2009) or in the evaluation of hospitals, schools (Vrabková et al., 2017), libraries (Stejskal et al., 2013; Richter, 2015) or the ZOO (Bečica, 2016). Mitwallyová (2014) says that the main feature of the contributory organizations that most often provide public services in the Czech Republic is non-profitability and the difference between own revenues and total costs is subsidized by the founder. In this respect, the differences in the legal form of the established organizations are considered and it suggests that the legal form is not important and that most of the funds needed for the provision of public goods and services are provided from public budgets (state, regions or municipalities). The viability of organizations in the cultural sector in the Czech Republic has been analysed by Dostál and Kislíngerová (2012). The foreign authors engaged in the field of scenic arts, theatre, culture and traditions are e.g. Meineck (2010) in the USA or Julien (2017), who deals with the functioning of theatres in Canada. Similarly in Romania, Corboş and Popescu (2013) study the role of the theatres in improving of Bucharest competitiveness. In their work, it can be observed that the theatre can become a unique cultural centre that contributes to a strategic development of the territory.

5. Usage of MCDM Methods in Public Sector Assessment

Several methods are used for the evaluation in public sector. For the evaluation of public organizations in selected public sectors, data envelopment analysis (DEA) (Wang, et al., 2016) or Balanced Scorecard (Badia and Borin, 2012; Kaplan and Northon, 2001) are used. Other methods such as economic-size and structural analysis, cluster analysis or cultural satellite accounts (UNESCO, 2009) are also applied. Following the study of Shaout and Yousif (2014), mostly multi-criteria decision-making methods (MCDM) are used for the evaluations of the selected sectors of national economies. For example, TOPSIS, WSA, VIKOR, AHP are used to evaluate the performance in health system (Karadayi and Karsak, 2014) or public transportation services (Keyvan-Ekbatani and Cats, 2015). TOPSIS and WSA are used to assess electronic services in public administration, as seen e.g. in Ardielli (2015) or Ardielli and Halásková (2015). WSA is also

applied for the evaluation of the level of public goods provided by Czech professional theatres in the presented paper.

6. Material and Methods

The article focuses on the evaluation of the level of provided mixed public goods (with a link to the financial ensuring of these goods) in the theatre field in the Czech Republic. This objective is accomplished using a model of multi-criterial analysis of variants, where the output is the achievement of the complete arrangement of the set of variants (individual theatres) according to the monitored criteria (the level of provided public goods). The results describe the availability of cultural goods of monitored theatres to the citizens in sense of technical and financial aspects and the success rate of individual theatres providing cultural goods and services with regard to technical equipment and the financial aspect of the operation. Due to the limits of the applied statistical method, the results of the paper are not generalized and no concrete individual conclusions could hence be drawn.

6.1 Material and Data

The vast majority of the data used has been obtained from the annual reports of these theatres for the years 2010 and 2015 and from the specialized information portal of the Ministry of Finance of the Czech Republic – IISSP – Monitor (MFČR, 2017). Some data have also been obtained through primary research, especially from the survey inquiry realized at selected theatres. To obtain comparable data for theatres is not a simple task. The authors have faced a number of data deficiencies.

Within the evaluated data set of individual professional theatres, there are partial differences between the comparative years 2010 and 2015 which are based on the different data that were for the purposes of the article primarily obtained from the relevant annual reports and the profit and loss statements. Occasionally, the information provided on the website of a given theatre (such as the number of seats offered for sale) can slightly differ with the information provided in the official annual report (e.g. CED Brno).

The number of seats for individual theatres was acquired from the available data (usually annual reports) from 2015. Looking into the annual reports and information on the theatre's website, the ticket sales system and various promotional materials, the data on the number of seats often do not correspond and it is difficult to judge which piece of information to take as final. In some cases, these differences can be caused by the fact that for some performances of given institution the number of seats is slightly different as the number given in the annual report e.g. in case of selected titles the number of seats for a performance is temporarily reduced. An example would be the play "The Little Prince" presented on the New Stage of the National Theatre in Prague. In case of this performance the specified part of the auditorium (specified number of seats) was changed as a part of the stage.

The economic aspect of the operation of theatres is also influenced, to a certain extent, by the state of publication of information according to legal form. For instance, there could be a difference in reporting in the profit and loss statements for contributory organizations and business companies or public service companies. A practical example

would be the change of legal form at “Severočeské divadlo opery a baletu” in Ústí nad Labem, which was a contributory organization of the statutory city in 2010 and in 2015 was a business company. The founder of the contributory organization was until 2012 the Statutory City of Ústí nad Labem, and since 2013 the founder of the theatre is Statutory City of Ústí nad Labem (50 %) and the Ústí nad Labem Region (50 %). The reason for the change in the legal form of the theatre was the fact that the theatre had been in a long-term loss - the income of the theatre was incapable to even cover the operating costs and the actors’ fees. As a result, the Statutory City puts the property (theatre building) at the value of CZK 80 million as a share capital in the newly-built business company, and the Region puts in the cash amount of CZK 20 000, creating a basic capital of CZK 80 020 000. Due to the change in legal form, the new reporting of economic information on the theatre's economy has also been included in the profit and loss statement and annual reports. “Severočeské divadlo opery a baletu, s. r. o.” unfortunately is not the only theatre that has changed its legal form over the course of time, and which makes the multi-criteria comparison of professional theatres more complicated than might seem at first glance.

In spite of all these deficiencies, the authors of the article have attempted to select those indicators that allow multi-criteria comparison of evaluated theatres (available for all evaluated institutions) and to use this for the evaluation of the provision of mixed public goods in the field of scenic art to the ordinary population as their consumer.

6.2 Model and Input Data

Multi-criteria decision models show decision-making issues where the consequences of decisions are assessed based on multiple criteria. This “multi-criteriality” characterizes almost every decision-making situation. In these models of multi-criterial analysis of variants, a final set of variants m is given, determined by n criteria. The purpose of the models is to either find the best variant, to exclude ineffective variants or to establish a set of variants (Šubrt et al., 2015).

In the modelling process specific conditions of theatre operation as the provider of mixed public goods have been taken into account, such as organization ensuring, providing and financing the cultural outputs. The evaluation of goods and services provision by professional theatres was derived from the utility function. With regard to this, relevant technical and financial indicators have been chosen. The indicators evaluate the availability of mixed public goods to citizens (technical indicators such as the number of places or genres; financial indicators such as the average cost of a ticket) as well as the performance of the organization (input indicators such as total revenues, total costs, wage costs or energy costs; output indicators such as the number of titles or visitors). A specific case is transfers (it is necessary to consider that they go from the citizens’ own wallets), and they are therefore processed as minimization criterion – the smaller the subsidy the better the rating.

The elements of the model of multi-criteria analysis of variants:

- variants of decisions $a_i, i=1, \dots, m$ (professional theatres in the Czech Republic)
- criteria $f_j, j=1, \dots, n$ used to evaluate the variants (16 indicators)

- evaluation (preference) of variants according to individual criteria y_{ij} , $i=1, \dots, m$, $j=1, \dots, n$
- preference of criteria v_j , $j=1, \dots, n$, expressing their importance

The weight of criteria is determined with the scoring method. The methods identifying criteria weights from the cardinal information about their preferences assume that the evaluator is able to determine the order of importance of the criteria and the ratio of the importance between all pairs of criteria. The most commonly used method is the scoring method, which transforms the point assessment of the importance of the criteria into the form of the weighting vector. The criteria were evaluated by two experts. The selected criteria and their weights are summarized in Table 1, and the rationale behind the inclusion of individual criteria in the model is described below the table.

Table 1. Selected criteria and their weights

No.	Criteria	Weight	Importance
I ₁	Number of seats	0.0875	Weights for a total area of 0.5.
I ₂	Number of scenes	0.0875	
I ₃	The number of ensembles	0.0875	
I ₄	Drama	0.0175	
I ₅	Opera	0.0175	
I ₆	Operetta, Musical	0.0175	
I ₇	Ballet	0.0175	
I ₈	Other genres	0.0175	
I ₉	Number of titles	0.12	
I ₁₀	Theatre attendance	0,03	
I ₁₁	Total revenues	0.0833	Weights for a total area of 0.5.
I ₁₂	Total costs	0.0833	
I ₁₃	Average ticket	0.0833	
I ₁₄	Founder's per capita contribution	0.0833	
I ₁₅	Wage costs	0.0833	
I ₁₆	Energy consumption	0.0833	
	Total	1.0000	

Source: MFČR, 2017, Annual reports from 2010-2015, authors' own processing

The authors of the paper are aware that weighting evaluation is always very problematic; therefore, after all circumstances were discussed and considered, the same weight was assigned to the criteria of first group of indicators (I₁ - I₁₀) – 0,5 and second group of indicators (I₁₁ - I₁₆) – 0,5. The first set of indicators has an impact on the size and diversity of the public good provided:

- $I_1 - I_3$: Selected indicators are important in terms of assessing the technical ensuring of the cultural goods and services (numbers of seats, scenes, artistic ensembles) and testify the availability of goods and services for citizens.
- $I_4 - I_9$: The indicator describes the real availability of cultural mixed public goods of interpretative art of selected organizations (production of live theatre performances, concerts, opera or dance performances, group activities, orchestras or bands, activities of individual artists such as actors, dancers or musicians). Indicators $I_4 - I_8$ do not only take into account the total number, but also the number of individual genres – it is hence divided into more indicators.
- I_{10} : The indicator of total theatre attendance illustrates the popularity of the theatre, respectively the provided mixed public goods.

The second group of indicators then shows the financial complexity of the mixed public goods provided:

- $I_{11} - I_{14}$: The indicators describe the financial ensuring of the availability of the public goods and services of the interpretative art of selected organizations. Total revenues (including operating subsidies) demonstrate viability and management of the organization, total costs of securing the production of public goods and services per capita (the total costs are based on the official values stated in the information system of the Ministry of Finance of the Czech Republic – IISPP – Monitor and they are the result of the sum of item A of the Profit and Loss Account for the main activity and economic activity), average cost of a ticket (showing the approach of management or a public founder to price setting, which, in accordance with the Cultural Policy of the Czech Republic, should in the area of scenic arts be widely available to public - the final consumer), founder's per capita contribution (showing the willingness of the founder to contribute to the ensuring of the institution's operation, taking into account the actual number of visitors).
- I_{15} : The indicator of total wage costs is the sum of the items of the Profit and Loss Account for the main activity: labour costs, statutory social insurance and statutory social costs. Neither the actual nor the recalculated number of employees according to time job is published in the official statistics.
- I_{16} : Energy costs of individual theatres per year

All indicators are given in the same units for each theatre. Using the WSA method, the input data are converted to percentage expressions to disturb the effects of different units and scales. The indicators $I_1 - I_{11}$ have been chosen with a maximizing character, while the indicators $I_{12} - I_{16}$ were minimizing.

6.3 Methods

The multi-criteria decision model was carried out using the WSA method. The WSA method (Weighted Sum Approach) requires cardinal information, cardinal matrix Y and vector of criteria weights v . The output of WSA is the overall rating for each variant and can be used to organize variants from best to worst. The WSA method is based on linear utility function, following the principle of utility maximization. If the variant a_i reaches the certain value y_{ij} according to criterion j , it gives the user the utility that can be ex-

pressed using a linear function of utility. The total utility of the variant is expressed by the weighted sum of the values of the partial utility functions; see formula (1):

$$u(a_i) = \sum_{j=1}^m v_j \cdot u_j(y_{ij}) \quad (1)$$

where u_j are partial functions of utility of individual criteria and v_j is criteria weights. The algorithm of the WSA method consists of three steps. First, ideal variant H with the evaluation $(h_1, \dots, h_n)$ and basal variant D with the evaluation $(d_1, \dots, d_n)$ are obtained. Next, a standardized criterial matrix R is acquired, the elements of which are calculated with the formula (2):

$$r_{ij} = \frac{y_{ij} - d_j}{h_j - d_j} \quad (2)$$

The matrix R is already the value matrix of utility function of the i -th variant of the j -th criterion as the elements of this matrix are transformed criterial values, such as $r_{ij} \in \langle 0; 1 \rangle$. Then the basal variant corresponds to the value of 0 and the ideal variant to the value of 1. Finally, the aggregate utility function is calculated for each variant, see formula (3):

$$u(a_i) = \sum_{j=1}^n v_j r_{ij} \quad (3)$$

Lastly, the variants are sorted in a descending order according to their $u(a_i)$ value.

7. Results and Interpretations

For the research, a definite list of variants (28 professional theatres) and criteria (16 technical and financial indicators) was selected. The level of mixed public goods provided by Czech professional theatres was evaluated using the WSA method. The evaluation was performed for the year 2010 and 2015. In this section of the article, the results the WSA method application are presented. The input data from 2010 are summarized in Table 2 and Table 3.

The application of WSA was processed based on the calculation of the total utility $u(a_i)$ of each variant. Next, the variants were arranged according to their values of total utility from highest to lowest, ranging between 1 and 0. The ranking of Czech professional theatres in 2010 is shown in Table 4.

Table 2. Input data (2010), indicators $I_1 - I_9$

Theatre	I_1	I_2	I_3	I_4	I_5	I_6	I_7	I_8	I_9
CED Brno	720	4	3	423	17	14	0	35	82
Divadlo ALFA Plzeň	230	1	1	0	0	0	0	271	20
Divadlo F.X. Šaldy v Liberci	862	2	3	169	45	50	25	7	56
Divadlo J.K. Tyla Plzeň, p.o.	1055	3	4	191	120	162	78	0	53
Divadlo Na zábradlí Praha	195	2	1	223	0	0	0	11	21
Divadlo Příbram (Antonína Dvořáka)	750	2	1	208	0	3	0	13	21
Horácké divadlo Jihlava	416	2	1	119	0	64	0	0	13
Jihočeské divadlo České Budějovice	992	4	4	195	64	33	35	226	74
Loutkové divadlo Radost Brno	347	3	1	0	0	0	0	374	28
Městská divadla pražská	760	3	1	529	0	0	0	0	39
Městské divadlo Brno	1045	2	3	223	0	231	0	0	48
Městské divadlo Zlín	771	2	1	233	0	38	0	30	32
Moravské divadlo Olomouc	398	1	3	143	50	58	21	22	37
Naivní divadlo Liberec	262	1	1	0	0	0	0	327	22
Národní divadlo Brno	1888	3	3	347	95	19	70	22	93
Národní divadlo moravskoslezské Ostrava, p.o.	1130	2	4	192	112	122	63	0	73
Národní divadlo Praha	3137	4	4	415	196	0	139	137	98
Slezské divadlo Opava	357	1	2	131	20	37	14	18	41
Slovácké divadlo Uherské Hradiště	387	1	1	238	0	36	0	0	19
Těšínské divadlo Český Těšín	377	1	3	149	0	101	0	138	32
Východočeské divadlo Pardubice	452	1	1	237	0	69	0	15	29
Západočeské divadlo Cheb	300	2	1	197	0	0	0	20	29
Dejvické divadlo o.p.s.	153	1	1	211	0	0	0	0	14
Divadlo Drak Hradec Králové	240	2	1	0	0	0	0	259	16
Klicperovo divadlo Hradec Králové	620	3	1	307	0	23	0	0	22
Severočeské divadlo opery a baletu	486	1	2	0	33	20	19	35	32
Městské divadlo Kladno	256	2	2	139	0	22	0	246	44
Divadlo Šumperk s.r.o.	315	1	1	167	0	0	0	0	17

Source: MFČR, 2017, Annual reports from 2010-2015, authors' own processing.

Table 3. Input data (2010), indicators $I_{10} - I_{16}$

Theatre	I_{10}	I_{11}	I_{12}	I_{13}	I_{14}	I_{15}	I_{16}
CED Brno	54655	46786	46716	190	666	31369	2302
Divadlo ALFA Plzeň	35368	31507	26631	243	648	14392	848
Divadlo F.X. Šaldy v Liberci	87695	96100	96070	179	917	66950	4871
Divadlo J.K. Tyla Plzeň, p.o.	172517	189145	188812	211	886	128574	7240
Divadlo Na zábradlí Praha	34548	28953	28863	226	612	18297	818
Divadlo Příbram (Antonína Dvořáka)	62662	42344	41997	333	343	19614	2469
Horácké divadlo Jihlava	51955	38101	37933	188	546	23778	2434
Jihočeské divadlo České Budějovice	145795	134009	135785	325	594	80445	4756
Loutkové divadlo Radost Brno	63954	24445	24431	77	305	14589	1084
Městská divadla pražská	155425	91809	91364	231	359	42692	2199
Městské divadlo Brno	210366	257487	257483	436	788	120149	5505
Městské divadlo Zlín	86134	62133	61580	198	524	35189	2430
Moravské divadlo Olomouc	94551	122101	120795	225	1067	81869	3483
Naivní divadlo Liberec	50785	16891	16789	73	259	10121	792
Národní divadlo Brno	228145	377137	377134	348	1305	202608	15052
Národní divadlo moravskoslezské Ostrava, p.o.	165830	231528	244892	224	1172	171518	8205
Národní divadlo Praha	406873	758094	752430	681	1182	419491	34850
Slezské divadlo Opava	69007	72264	72254	109	938	56143	1577
Slovácké divadlo Uherské Hradiště	86765	38516	38268	152	291	23946	1981
Těšínské divadlo Český Těšín	85345	54403	54402	116	522	29765	1804
Východočeské divadlo Pardubice	103380	63267	63230	240	372	39265	1383
Západočeské divadlo Cheb	100000	36040	36045	150	303	18274	3020
Dejvické divadlo o.p.s.	35816	26078	26078	383	345	15154	617
Divadlo Drak Hradec Králové	55909	23805	22916	88	338	13468	774
Klicperovo divadlo Hradec Králové	74959	55791	55627	281	464	33074	2309
Severočeské divadlo opery a baletu	31955	69362	75781	537	1633	52182	2180
Městské divadlo Kladno	82893	49230	48730	117	471	31363	4012
Divadlo Šumperk s.r.o.	36350	17494	17957	135	346	8259	3000

Source: MFČR, 2017, Annual reports from 2010-2015, authors' own processing.

Table 4. Level of provided mixed public goods in Czech professional theatres (2010)

Order	Variant	Utility	Order	Variant	Utility
1	Jihočeské divadlo České Budějovice	0.66130	15	Městské divadlo Zlín	0.46409
2	CED Brno	0.64703	16	Divadlo Drak Hradec Králové	0.45847
3	Divadlo J.K. Tyla Plzeň, příspěvková organizace	0.59833	17	Naivní divadlo Liberec	0.44850
4	Národní divadlo Praha	0.57839	18	Slezské divadlo Opava	0.44758
5	Národní divadlo Brno	0.56818	19	Moravské divadlo Olomouc	0.44670
6	Národní divadlo moravskoslezské Ostrava, příspěvková organizace	0.56159	20	Divadlo Příbram (Antonína Dvořáka)	0.43730
7	Divadlo F.X. Šaldy v Liberci	0.53030	21	Východočeské divadlo Pardubice	0.42957
8	Městská divadla pražská	0.51825	22	Slovácké divadlo Uherské Hradiště	0.42761
9	Loutkové divadlo Radost Brno	0.51612	23	Horácké divadlo Jihlava	0.42324
10	Městské divadlo Kladno	0.51186	24	Divadlo Na zábradlí Praha	0.42151
11	Těšínské divadlo Český Těšín	0.50262	25	Divadlo Šumperk s.r.o.	0.41326
12	Městské divadlo Brno	0.50223	26	Divadlo ALFA Plzeň	0.39359
13	Klicperovo divadlo Hradec Králové	0.46667	27	Dejvické divadlo o.p.s.	0.37617
14	Západočeské divadlo Cheb	0.46449	28	Severočeské divadlo opery a baletu	0.33040

Source: MFČR, 2017, Annual reports from 2010-2015, authors' own processing.

The WSA method evaluating the level of mixed public goods provided by Czech professional theatres in 2010 has ranked “Jihočeské divadlo České Budějovice” on the 1. position, “CED Brno” on the (2. position) and “Divadlo J.K. Tyla Plzeň, příspěvková organizace” on the 3. position. It means that the best level of cultural public goods is provided in these theatres. In contrast, the level of cultural public goods provided is apparently worst in “Divadlo ALFA Plzeň”, “Dejvické divadlo o.p.s” and “Severočeské divadlo opery a baletu”. The ranking of Czech professional theatres in 2015 is presented in Table 5.

Table 5. Level of provided mixed public goods in Czech professional theatres (2015)

Order	Variant	Utility	Order	Variant	Utility
1	Divadlo J.K. Tyla Plzeň, příspěvková organizace	0.59017	15	Divadlo Drak Hradec Králové	0.44558
2	Jihočeské divadlo České Budějovice	0.58457	16	Divadlo Příbram (Antonína Dvořáka)	0.43528
3	CED Brno	0.56046	17	Naivní divadlo Liberec	0.43461
4	Národní divadlo Praha	0.54284	18	Západočeské divadlo Cheb	0.42673
5	Loutkové divadlo Radost Brno	0.51468	19	Východočeské divadlo Pardubice	0.42531
6	Divadlo F.X. Šaldy v Liberci	0.50356	20	Horácké divadlo Jihlava	0.42390
7	Národní divadlo Brno	0.49805	21	Moravské divadlo Olomouc	0.42344
8	Národní divadlo moravskoslezské Ostrava, příspěvková organizace	0.49512	22	Severočeské divadlo opery a baletu	0.42055
9	Městská divadla pražská	0.49397	23	Slovácké divadlo Uherské Hradiště	0.41759
10	Městské divadlo Brno	0.49086	24	Divadlo Na zábradlí Praha	0.40948
11	Těšínské divadlo Český Těšín	0.47978	25	Slezské divadlo Opava	0.40258
12	Klicperovo divadlo Hradec Králové	0.46444	26	Divadlo Šumperk s.r.o.	0.39517
13	Městské divadlo Kladno	0.45649	27	Divadlo ALFA Plzeň	0.39461
14	Městské divadlo Zlín	0.44833	28	Dejvické divadlo o.p.s.	0.36127

Source: MFČR, 2017, Annual reports from 2010-2015, authors' own processing.

It can be observed in Table 5 that in 2015 the best level of mixed public goods provided can be found in “Divadlo J.K. Tyla Plzeň, p.o.” (1. position), “Jihočeské divadlo České Budějovice” (2. position) and “CED Brno” (3. position). In contrast “Divadlo Šumperk s.r.o.”, “Divadlo ALFA Plzeň” and “Dejvické divadlo o.p.s.” were found to provide the worst level of mixed public goods.

The Czech professional theatres were divided into 4 categories (clusters) based on their values of total utility $u(a_i)$, see the results for 2010 in Table 6. The hierarchical clustering was performed using the Ward's method in the IBM SPSS software. The purpose of the clustering was to compare the groups of theatres in 2010 and 2015 individually and find out if there were any significant changes in the assessment in long term.

Table 6. Categories of professional theatres by provided mixed public goods (2010)

CATEGORY 1	CATEGORY 2	CATEGORY 3	CATEGORY 4
Jihočeské divadlo České Budějovice, CED Brno, Divadlo J.K. Tyla Plzeň, příspěvková organizace, Národní divadlo Praha.	Národní divadlo Brno, Národní divadlo moravskoslezské Ostrava, příspěvková organizace, Divadlo F.X. Šaldy v Liberci, Městská divadla pražská, Loutkové divadlo Radost Brno, Městské divadlo Kladno, Těšínské divadlo Český Těšín, Městské divadlo Brno.	Klicperovo divadlo Hradec Králové, Západočeské divadlo Cheb, Městské divadlo Zlín, Divadlo Drak Hradec Králové, Naivní divadlo Liberec, Slezské divadlo Opava, Moravské divadlo Olomouc, Divadlo Příbram (Antonína Dvořáka),	Východočeské divadlo Pardubice, Slovácké divadlo Uherské Hradiště, Horácké divadlo Jihlava, Divadlo Na zábradlí Praha, Divadlo Šumperk s.r.o., Divadlo ALFA Plzeň, Dejvické divadlo o.p.s., Severočeské divadlo opery a baletu.

Source: MFČR, 2017, Annual reports from 2010-2015, authors' own processing.

In Table 6 there are 4 categories of theatres according to the similarity of the results achieved. In category 1 are theatres that have performed the best in the indicator evaluation. These are the theatres that provide the best level of mixed public goods. Category 2 contains theatres that have achieved worse results, but still providing an agreeable level of mixed public goods. The theatres listed in category 3 provide a below-average level of mixed public goods. Category 4 lists theatres with the worst level of mixed public goods provision. The results of the hierarchical clustering for 2015 are summarized in Table 7.

Table 7. Categories of professional theatres grouped by provided mixed public goods (2015)

CATEGORY 1	CATEGORY 2	CATEGORY 3	CATEGORY 4
Divadlo J.K. Tyla Plzeň, příspěvková organizace, Jihočeské divadlo České Budějovice, CED Brno, Národní divadlo Praha.	Loutkové divadlo Radost Brno, Divadlo F.X. Šaldy v Liberci, Národní divadlo Brno, Národní divadlo moravskoslezské Ostrava, příspěvková organizace, Městská divadla pražská, Městské divadlo Brno, Těšínské divadlo Český Těšín, Klicperovo divadlo Hradec Králové.	Městské divadlo Kladno, Městské divadlo Zlín, Divadlo Drak Hradec Králové, Divadlo Příbram (Antonína Dvořáka), Naivní divadlo Liberec, Západočeské divadlo Cheb, Východočeské divadlo Pardubice, Horácké divadlo Jihlava.	Moravské divadlo Olomouc, Severočeské divadlo opery a baletu, Slovácké divadlo Uherské Hradiště, Divadlo Na zábradlí Praha, Slezské divadlo Opava, Divadlo Šumperk s.r.o., Divadlo ALFA Plzeň, Dejvické divadlo o.p.s.

Source: MFČR, 2017, Annual reports from 2010-2015, authors' own processing.

From Table 6 and 7 it is evident that the same four theatres are included in the first category for both 2010 and 2015. It could be concluded that the provision of cultural mixed public goods in terms of the indicators monitored in this article is relatively stable for these four theatres and they are most successful in cultural goods provision in the long term.

Category 4 lists theatres that are least successful in the provision of mixed public goods in terms of technical and financial aspects. Both in 2010 and 2015 this category includes the theatres "Slovácké divadlo Uherské Hradiště", "Divadlo Na zábradlí Praha", "Divadlo ALFA Plzeň", "Divadlo Šumperk s.r.o.", "Dejvické divadlo o.p.s." and „Severočeské divadlo opery a baletu“. From this result, it can be concluded that the provision of cultural mixed public goods by these theatres is the worst of the set of evaluated theatres in the Czech Republic in the long term.

"Slezské divadlo Opava" falls from category 3 in 2010 to category 4 in 2015. The reason is the deterioration of the values of all financial indicators and the reduction of the number of titles (from 41 to 32). "Moravské divadlo Olomouc" also experiences the same change in categories due to the minor worsening of values of financial indicators (primarily the average ticket price, from CZK 225 in 2010 to CZK 264 in 2015, and the total costs from CZK 120,795,000 in 2010 to CZK 133,580,000 in 2015).

As for "Východočeské divadlo Pardubice", an improvement in the values of technical indicators can be observed between 2010 and 2015 (mainly an increase in the number of titles from 29 to 43). This result moves the theatre from category 4 in 2010 to category 3 in 2015. Improvements in monitored indicators between 2010 and 2015 can be also found with "Horácké divadlo Jihlava" that experiences the same upgrade within the years.

Minor changes and movement between categories 2 and 3 in long term are only evident for "Klicperovo divadlo Hradec Králové" and "Městské divadlo Kladno"; the set of theatres listed in the categories otherwise remains unchanged for both 2010 and 2015. This result shows that the theatres are ranked similarly even in a longer period and the provision of mixed public goods is remaining relatively stable in long period.

8. Discussion

There have already been authors dealing with the issues of evaluations in art and culture non-profit organizations abroad (Turbide and Laurin, 2009; Badia and Borin, 2012; Kaplan and Northon, 2001; Cai and Wang, 2012). For example, DCA (2014) has developed a new integrated quality assessment method, which addresses different attributes of the theatre as a space used for cultural activities and helps to offer the public the full value of arts and cultural activities. Whereas Borg (2017) has assessed eight theatres in Valletta and the Grand Harbour Region. He has also examined the city of Victoria in Malta. The sample consisted of five public theatres, two community theatres and one belonging to the University of Malta. This quality assessment addressed technical issues, social and cultural aspects, management and financial constraints, and other aspects contributing to the quality.

The focus has generally been mainly on the performance evaluation of the organizations. However, we have not found any similarly oriented publications in the Czech environ-

ment. As stated by Chiaravalloti (2014), performance evaluation (as means of a government control) in the publicly funded culture sector has received much attention in recent years. This is determined by the fact that the public funds are limited and the governments are under an increased pressure from citizens to “give value for money” (Mihaiu, 2014). But in practice, the measurement of performance in cultural sector deals with number of difficulties, such as defining performance, identification of suitable indicators or implementation of performance management system, as stated by Mihaiu (2014). Also, a large range of indicators has been introduced for the purpose of a performance measurement (Keyvan-Ekbatani and Cats, 2015). Performance indicators are typically focused on financial measures (Turbide and Laurin, 2009), but non-financial indicators have also been considered, especially in an examination of non-profit organizations (Kaplan and Northon, 2001, Cai and Wang, 2012). The vast majority of organizations in cultural sector (non-profit organizations performing artistic disciplines such as circus, dance, music, theatre or variety) use multiple indicators to measure their performance (Turbide and Laurin, 2009).

The authors’ objective was to select indicators allowing multi-criteria comparison of selected Czech professional theatres (available for all evaluated institutions) and use it to examine the provision of mixed public goods by theatres to citizens as their consumers. In terms of availability of goods to citizens, their technical and financial aspects are essential and were hence included in the paper. The theatres have been ranked according to the level of mixed public goods they provide, from the best value of total utility to the worst.

However, the purpose of this article is not to evaluate the performance of the organizations; the input / output ratio was not, therefore, measured. Even so the emphasis was also put on the representation of both types of indicators (input and output) and allocation efficiency. For example, the indicator of value of public expenditures (transfers of the founder) is processed as criteria with a minimizing character.

From the results it is evident that between 2010 and 2015 there are no significant differences in the rankings of individual theatres. This means that there were not any significant technical or financial changes over time that would produce a significant increase or decrease in the level of provided mixed public good. Nonetheless, the results show significant differences between individual professional theatres in the level of cultural mixed public goods provided in terms of technical and financial ensuring. The level of public goods provided by the worst-performing theatre is in 2010 about 50 % and in 2015 39 % lower than by the best-ranking theatre.

In the long run, the highest level of mixed public goods is provided by the following theatres: “Jihočeské divadlo České Budějovice”, “CED Brno”, “Divadlo J.K. Tyla Plzeň, p.o.” and “Národní divadlo Praha”. These organizations have the same characteristics in terms of the monitored indicators. They have proven to have the best values of technical indicators such as the number of seats, scenes and titles presented. Within the framework of financial indicators, these theatres achieve the highest total revenues and offer lowest average ticket prices.

Some of the results are somewhat more surprising. For example, although “Městské divadlo Brno” has one of the largest seat capacities, the number of scenes and titles is lower than in the case of the best rated theatres; also, the average price of a ticket (436

CZK) is above average (the average value in 2010 was 242 CZK). This result moves this theatre to the 12th position. On the other hand, “Jihočeské divadlo České Budějovice” has performed very well in 2010 compared to “Národní divadlo Praha”, despite its seat capacity being only a third of the latter. This is the only theatre apart from “Národní divadlo Praha” with four scenes; it also has the third highest number of titles put on. Additionally, its average ticket price (CZK 325) is only about a half of the ticket price in “Národní divadlo Praha” (681 CZK).

Conclusion

The aim of the article is to evaluate the level cultural mixed public goods provided by selected Czech professional theatres. The multi-criteria method (WSA) chosen for the evaluation has allowed a comparison of Czech professional theatres in terms of the level of mixed public goods they provide. This level depends on the values of the 16 technical and financial indicators selected. In the results, the theatres are ranked according to their level of mixed public goods provided from best to worst.

Based on the research on the individual members of the Professional Theatre Association, it can be stated that these organizations are not similar. Each organization is different in terms of its capacity, financial possibilities, management, number of managed halls, or targeted production. The theatres in the Association mainly are contributory organizations; only three of the theatres are limited liability companies and only three are companies of general interest. As for the founders, the legal form of the theatre is only a formal matter since they all are established and supported by the city, the region or the Ministry of Culture of the Czech Republic. Also, the level of mixed public goods provided is different.

The article demonstrates the different levels of mixed public goods provided by Czech professional theatres based on the selected influencing technical and financial indicators and the multi-criteria decision-making method WSA. The highest level of mixed public goods provided has been identified in the case of “Jihočeské divadlo České Budějovice”, “CED Brno”, “Divadlo J.K. Tyla Plzeň, p.o.”, and “Národní divadlo Praha”. The cluster analysis has confirmed a relative stability of the level of mixed public goods over time (2010 – 2015).

Since the results of the paper (the rating of the individual theatres) depend on the number of genres, the size of the auditorium and the number of scenes the theatre operates with, it is not easy to recommend a general improvement proposal for all theatres. Recommendations could only be made for individual theatres, which is not possible due to the scope of the article. The “big theatres” mostly ranked on the first places, which is a consequence of the chosen methodology as the aim of the article is to assess the availability of mixed public goods to citizens (in the form of technical and financial availability of the theatre performance). In case of theatres with large auditoriums, higher frequency of performances is available and also the number of realized genres. However, the entry level usually is also higher, which the methodology takes into account and which has moved some of the “big theatres” to worse positions (such as “Městské divadlo Brno”). The criteria of the analysis show that “small theatres” (usually only putting on plays and having smaller audiences, such as “Dejvické divadlo”, “Divadlo ALFA Plzeň” or “Divadlo Na zábradlí Praha”) has ranked the worst. Nonetheless,

“Dejvické divadlo” has a higher average price of tickets, so it is, from the perspective of citizens, less available in terms of technical and financial aspects. In addition, “Severočeské divadlo opery a baletu”, which has the worst ranking, is a medium theatre in the sense of number of seats (486). Were the input data chosen differently, the results would have changed, which could be demonstrated, for example, with the DEA method that uses economic indicators. “Small theatres” would then rate better than “big theatres”.

However, the practical applicability of the conclusions is given by the significant proportion of public theatres set up by public bodies (ministry, region or municipality). Precisely for these founders the information of “whether public theatres provide public goods at sufficient level and efficiently” is important. The presented output of the article could serve as an appropriate guide to founders of public theatres. Apart from the accompanying findings of the research, they should find useful the proposed methodology for the assessment of the quality of public goods that the theatres established by these founders provide. This methodology is well suitable because it is based not solely on the assessment of financial indicators; its scope is wider. This fact is making it suitable special for the evaluation of cultural institutions.

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