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Spatiotemporal analysis of Polish municipal budget expenditure on selected categories of cultural institutions in the years 2003 to 2016

Abstract

Objectives: The main aim of the article is to analyse changes in spending on culture with regard to four selected groups: libraries, community cultural centres, heritage and monument protection, and others in the years 2003 to 2016. This article also looks at the sum of municipal budgets in individual provinces.

Research Design and Methods: For the selected years, location quotients (LQ) were used to show the spatial diversity of cultural expenditure in the municipalities of particular voivodships. To illustrate the diversity of municipal expenditure on culture in particular years of the analysis was made using a dynamic modification of Knudsen's regression model of share transfers proposed by Berzeg (the SSANOVA model).

Findings: The increase in the share of cultural expenditure followed by a decline thereof may indicate that in 2011–2014 the municipalities in Poland made significant expenditure on culture, which could have been aimed at improving both hard and soft cultural infrastructure. Analysis using the Knudsen model revealed a disturbing tendency to decrease the share of municipal expenditure devoted to culture in total expenditure

Implications/Recommendations: The fact that the majority of municipalities in Poland in the analysed period devoted a higher share of expenditure to cultural purposes than average spending of this type for Poland may indicate a change in the approach of local authorities to the culture as a potential factor for the development of a municipality, rather than unnecessary budget expenditure. The downward trend in the share of cultural expenditure of municipalities in their total expenditure may, though not necessarily does, indicate a change in the direction of cultural policy of local governments in Poland.

Contribution/Value Added: This approach opens new possibilities for analysing cultural expenditure from local budgets, as well as local cultural policies and the effectiveness of public finances.

Article classification: research article

Keywords: spatial shift-share analysis, cultural economics, public finances, municipal budgets

JEL classification: Z1, H7, C5

Introduction

In most countries the provision of cultural services is divided between the public and the

private sectors. The public sphere is further divided into different administrative levels: the central level, regional and county levels, and local municipalities (Håkonsen & Løyland,

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2015) The main purpose of the changes to the system in the field of culture after the systemic transformation was the introduction of mechanisms supporting an efficient and fair management of public resources, the introduction of changes in the public administration competencies relating to the organising of the culture financing process, and the introduction of new solutions in the scope of the financing, organising and managing of cultural institutions, such as decentralisation of cultural institution management, increasing of the autonomy of cultural institutions and development of legal frameworks for patronage and sponsorship in this area (Wrona, 2011). One of the most important changes in management processes and financing with regard to self-government units was the transmission of cultural tasks to the municipalities as obligatory own tasks. On one hand that gave to a significant scope of financial autonomy to Polish municipalities, but, on the other hand, those changes forced the municipalities to supply the financial background of all transmitted tasks from their own incomes. This situation resulted in a great variety of municipal revenues for culture and national heritage protection, correlating with municipal wealth and the way in which local politicians treat cultural matters with respect to socio-economic categories.

Literature review

The studies of various aspects of local cultural policy and local cultural spending can be grouped into two types. Most of those studies analyse local cultural expenditures as a whole, i.e. an aggregate of all cultural expenditure in a municipality (Depalo & Fideli, 2011; Benito et al., 2013; Werck et al., 2008) In addition, some studies analyse a specific local or regional cultural institution, such as an opera house (Schulze & Ursprung, 2000) or a theatre (Getzner, 2004). In this study, the author will combine the two types mentioned above and begin with by analysing the aggregated expenditures of municipal budgets in Poland on culture and national heritage for the economic

background according to the structure and types of cultural expenditures in the years 2003–2016. To point out the spatial diversity of cultural spending in municipalities of the particular voivodships the location quotient (LQ) has been used. A great variety of municipal revenues for the culture and national heritage protection correlated with the municipal wealth and the way in which local politicians treat cultural goods with respect to socio-economic categories. So, trials of quantitative evaluations of this category of municipal revenues have been carried out with consideration given to spatial-sectional and time range. This multi-dimensional approach made it possible to evaluate and estimate the level of the regional development according to the reference area and to analyse the speed and the structure of changes. One of the methods used to such analysis are methods involving Shift-Share Analysis (SSA) and its modifications enlarged with regard to the time dimension (Knudsen, 2000; Berzeg, 1984). The collected sample of statistic data considers the information about cultural revenues of Polish municipalities (by the voivodship) in the years 2003–2016, split into four groups of expenditure: libraries, community cultural centres, heritage and monument protection, and others (for example galleries and artistic exhibition offices). The statistical information considers the multi-dimensional data about municipal expenses in 16 regions with regard to four categories of cultural goods and services in a 14-year period (2003–2016).

Methods

The general description of expenses incurred by particular provincial governments for cultural institutions shows that these expenses are characterised by spatial diversity. Taking this into account, it seems advisable to perform a comparative analysis of the average of these expenses in Poland.

One of the tools used for spatial quantitative analysis are location quotients (LQ), in this case

calculated for the expenditure of provincial governments on particular cultural institutions.

In general, the location quotients (also known as concentration indices) are a commonly applied and practical planning tool used to understand local economic specialisation and economic dependency (Shaffer et al., 2004) applied in the analysis of the spatial distribution of dependence relationships between two variables, in this case between the total expenditure on culture and the expenditure on types of cultural institutions. Location quotients are also used as a management tool (Marcouiller et al., 2009). To calculate a location quotient one uses concentration indices determined on the basis of the Lorenz concentration curve. The Lorenz curve is a useful tool because it illustrates a natural order of distributions from the most even one to the most concentrated one (Sucheckki, 2010).

While interpreting location quotients one should take into consideration the values above and below unity. An LQ greater than 1 indicates that in the analysed area the spending on a particular type of cultural institutions is higher than the average spending in Poland, while an LQ below 1 indicates that the regional government spending on a particular type of cultural institutions is lower than the average spending in the reference field.

For studying spatiotemporal relationships the tools that consider the specificity of the analysed phenomenon or process are often used. Among them, a group of methods for analysing shift-share deserves particular attention. These tools fall within the scope of spatial statistics and econometrics. They are multi-dimensional in space–sector–time. This approach makes possible the assessment and examination of the level of a given area against the background of the reference area. It also allows one to account for the dynamics and structure of changes. Generally, two different models are considered: the Berzeg model and a dynamic modification thereof, the Knudsen model. In this research, the multi-dimensional data of the Polish municipal cultural expenditures by regions (NUTS 2, voivodships) on the different types of cultural

goods and services in the period of fourteen years (2003–2016) has been completed. This makes it possible to use more complex methods of the analysis with regard to dynamic aspects.

The collected sample of statistic data looks at information about cultural spending by Polish municipalities (by region) in the years 2003–2016 split into four groups of expenditure: libraries, community cultural centres, heritage and monument protection, and others (for example galleries and artistic exhibition offices). The statistical information covers multi-dimensional data about municipal expenses in 16 regions with regard to four categories of cultural goods and services in the 14-year period (2003–2016). That structure and the large number of statistical samples ($16 \times 4 \times 14$ observations) make it possible to use the SSANOVA panel model as a tool to analyse municipal cultural expenditures in Poland.

In the literature on the subject, the two most commonly used variants of SSA models are most often mentioned: the Berzeg model (Berzeg, 1984) and the Knudsen model (Knudsen, 2000). These are practical simplifications (used in empirical studies) of the general form of the total variance decomposition model for multi-dimensional data (Marimon & Zilibotti, 1998)

$$y_{rit} = h(i) + m(r,i) + b(t) + f(i,t) + g(r,t) + \varepsilon_{rit}$$

which includes: constant in time and in region structural variation $h(i)$, constant in time regional-sectoral variability $m(r,i)$, the trend of national growth rate $b(t)$, specific effects of sectoral growth trend $f(i,t)$, effects of changes in the time of regional growth of individual regions $g(r,t)$ and the random component of the model: ε_{rit} .

This article presents and discusses the results of the Knudsen model:

$$tx_{rit} = \sum_t a_{0t} + \sum_i a_i \cdot S_i + \sum_r b_r \cdot W_r + \varepsilon_{rit}$$

which is a dynamic decomposition of the increase in spending on culture, in which the variable growth rate in the following years is explained

(decomposed) $\text{txt} = [(\text{xt}-\text{xt}-1) / \text{xt}]$ including the division into components according to four types of expenditure and 16 voivodships with a variable effect of the temporal dimension, i.e. with different values of the total growth parameter (differentiation of the free expression) in particular years.

Results and discussion

The spending on culture from Polish municipal budgets was growing from 2003 until 2014 (Table 1). After that year the slight fall in cultural spending has been noted. In the first year of analysis, the amount of spending on culture by Polish municipalities was PLN 1,911.065 million and reached the level of PLN 5,274.949 million in the last estimated year. The highest level of spending on culture by Polish municipalities was in 2014 (PLN 6,243.012 million).

In the years 2003 to 2016 the highest level in cultural expenditure were noticed for municipalities in the Mazowieckie and Śląskie regions. The spending on culture by municipalities in Mazowieckie was highest in 2016, at PLN 890.024 million; while the municipalities in the Śląskie region spent the largest amount on culture in 2014: PLN 831.339 million. The year-to-year changes in cultural spending by Polish municipalities have been on a downwards trend since 2011. The percentage of the cultural spending in total budgetary expenses of municipalities in the analysed period averaged 2% to 4% and was highest in the municipalities of the Dolnośląskie region in 2014.

In the analysed period, municipal spending on culture increased until 2014 (Table 1). In the years 2003–2016, the share of spending on culture and national heritage protection in most municipalities in Poland was higher than the average

Table 1. The total cultural spending from municipal budgets in 2003, 2011 and 2016 (in PLN thousand) and its percentage in total expenditures (in percent)

Voivodship	2003	%	2011	%	2016	%
Poland	1,911,065	3	5,245,835	3.8	5,274,949	3.3
Dolnośląskie	189,685	4	521,547	4.0	565,099	4.6
Kujawsko-Pomorskie	84,684	2	251,269	3.3	234,337	2.6
Lubelskie	89,524	3	288,593	5.0	257,979	3.6
Lubuskie	47,068	2	174,989	6.8	129,841	2.4
Łódzkie	117,137	3	332,941	4.4	319,139	3.4
Małopolskie	164,627	3	428,639	4.9	466,831	3.9
Mazowieckie	288,558	3	791,225	3.7	890,024	3.4
Opolskie	47,996	2	140,163	6.0	133,599	3.9
Podkarpackie	89,300	2	238,897	2.6	227,789	2.3
Podlaskie	52,939	3	150,123	2.9	133,809	2.5
Pomorskie	109,283	3	383,461	4.6	358,286	3.9
Śląskie	267,808	3	538,853	3.2	567,693	2.8
Świętokrzyskie	42,068	3	144,005	2.9	116,290	2.3
Warmińsko-Mazurskie	62,228	3	167,994	2.4	157,335	1.8
Wielkopolskie	170,770	3	439,382	3.5	475,477	3.1
Zachodniopomorskie	87,340	3	253,353	4.0	241,421	3.1

Source: GUS, <https://stat.gov.pl/obszary-tematyczne/kultura-turystyka-sport/kultura/kultura-w-2017-roku,2,15.html>.

share of such expenditure in the reference area (Table 2). For municipalities in the Dolnośląskie and Małopolskie voivodships, the level of location quotient remained above one in the whole period covered by the study. In 2014, the municipalities of the Dolnośląskie Voivodship recorded a record-breaking LQ ratio of 2.13. This means that the share of cultural spending from municipal budgets in this voivodship was more than 100% higher than the share of cultural spending of municipal budgets in their total expenditure in Poland. The location co-efficients value above unity in the majority of the analysed period was also recorded in the Lubelskie, Łódzkie, Mazowieckie, Opolskie and Pomorskie voivodships. Particularly noteworthy are the municipalities located in the Opolskie voivodship: In their case, the LQ increased from 0.64 in 2003 to 1.21 in 2016.

The literature emphasises that a dynamic approach in structural and geographical analyses makes it possible to obtain better, more reliable

results, due to the better allocation of growth between components. Dynamic analysis also provides additional information, e.g. that the transformation of the regional economy is characterised by a specific development tendency.

The results of the Knudsen model analysis presented above, in addition to the sectoral components (expenditure and regional groups), also demonstrate the ability to draw conclusions about the trends of changes in the analysed fields of economic and social activity, in particular to take into account the variability of temporal effects of the national component, illustrated in Figure 1. The next points in the chart show a clear reduction in spending on culture, especially in 2011 compared with the previous year, down by more than 3%. Also, a large negative change is visible in 2015, down by more than 10% compared with the previous year (Table 2).

The accuracy of the Knudsen's estimation is also evidenced by the values of Student's t-statistics

Table 2. Location quotients (LQ) for municipal budget spending on culture in selected years of the period 2003–2016

Voivodship	2003	2005	2008	2011	2014	2016
Dolnośląskie	1.32	1.32	1.36	1.05	2.13	1.42
Kujawsko-pomorskie	0.77	0.69	0.85	0.86	0.47	0.79
Lubelskie	0.98	0.84	1.09	1.32	1.04	1.11
Lubuskie	0.52	0.50	0.56	1.79	0.68	0.74
Łódzkie	1.02	0.89	1.01	1.14	0.98	1.04
Małopolskie	1.07	1.36	1.01	1.30	1.58	1.19
Mazowieckie	1.02	1.18	1.20	0.96	0.70	1.04
Opolskie	0.64	0.76	0.82	1.57	1.07	1.21
Podkarpackie	0.68	0.64	1.06	0.69	0.46	0.70
Podlaskie	0.97	0.61	0.65	0.77	0.54	0.76
Pomorskie	1.04	0.90	1.06	1.20	1.32	1.19
Śląskie	1.03	0.99	0.82	0.84	1.05	0.85
Świętokrzyskie	0.86	1.00	0.62	0.77	0.60	0.71
Warmińsko-Mazurskie	0.83	0.82	0.97	0.63	0.50	0.55
Wielkopolskie	0.97	0.78	0.75	0.92	0.86	0.94
Zachodniopomorskie	1.03	0.89	0.84	1.05	0.93	0.94

Source: GUS, <https://stat.gov.pl/obszary-tematyczne/kultura-turystyka-sport/kultura/kultura-w-2017-roku,2,15.html>.

Table 3. Results of the analysis using the Knudsen dynamic model of the decomposition of the growth rate of expenditure on culture by four groups of expenditure and 16 voivodships in Poland in 2004/2003 to 2016/2015

	Parameter	Evaluation	in %	in %*13	t – stat	p – value
Domestic factor	A0	0.0163	1.63	162.95	res.	
Libraries	A1	-0.0193	-1.93	-193.37	-4.78	0.00
Cultural Centres	A2	-0.0096	-0.96	-95.84	-2.76	0.01
Heritage Protection	A3	-0.0248	-2.48	-247.83	-3.74	0.00
Others	A4	0.0700	7.00	700.00	res.	
Dolnośląskie	B1	0.0053	0.53	52.98	0.67	0.50
Kujawsko-pomorskie	B2	-0.0051	-0.51	-50.64	-0.53	0.60
Lubelskie	B3	0.0129	1.29	129.34	1.39	0.17
Lubuskie	B4	-0.0150	-1.50	-150.45	-1.41	0.17
Łódzkie	B5	-0.0023	-0.23	-23.13	-0.26	0.80
Małopolskie	B6	0.0061	0.61	60.59	0.74	0.46
Mazowieckie	B7	-0.0031	-0.31	-30.95	-0.41	0.68
Opolskie	B8	-0.0025	-0.25	-24.75	-0.22	0.83
Podkarpackie	B9	-0.0058	-0.58	-57.72	-0.61	0.55
Podlaskie	B10	0.0014	0.14	14.25	0.13	0.90
Pomorskie	B11	0.0071	0.71	71.31	0.82	0.41
Śląskie	B12	-0.0206	-2.06	-205.77	-2.63	0.01
Świętokrzyskie	B13	0.0138	1.38	138.09	1.21	0.23
Warmińsko-Mazurskie	B14	-0.0053	-0.53	-52.95	-0.50	0.62
Wielkopolskie	B15	0.0139	1.39	139.20	1.67	0.10
Zachodniopomorskie	B16	-0.0195	-1.95	-194.53	res.	
2004/2003	A43	0.1465	14.65		5.30	0.00
2005/2004	A54	0.1748	17.48		9.05	0.00
2006/2005	A65	0.2408	24.08		6.50	0.00
2007/2006	A76	0.1239	12.39		4.10	0.00
2008/2007	A87	0.1635	16.35		7.02	0.00
2009/2008	A98	0.1799	17.99		5.09	0.00
2010/2009	A109	0.1971	19.71		7.57	0.00
2011/2010	A1110	-0.0302	-3.02		-1.27	0.21
2012/2011	A1211	0.0470	4.70		2.12	0.04
2013/2012	A1312	0.0405	4.05		1.95	0.06
2014/2013	A1413	0.1451	14.51		6.47	0.00
2015/2014	A1514	-0.1018	-10.18		-4.48	0.00
2016/2015	A1615	-0.0108	-1.08		-0.44	0.66

Source: own elaboration based on the implementation of myr procedure (SUR – UWMNK), GUS, <https://stat.gov.pl/obszary-tematyczne/kultura-turystyka-sport/kultura/kultura-w-2017-roku,2,15.html>.

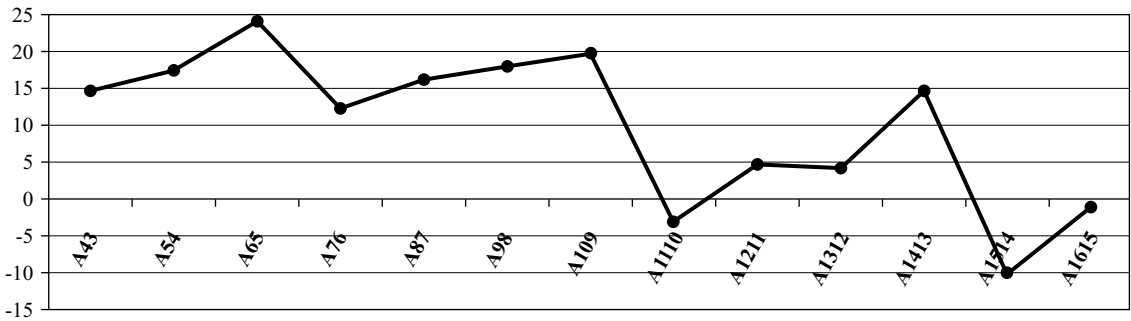


Figure 1. Changes in the domestic factor assessments value (free expression) in the period 2004/3 to 2016/15 on the basis of the results of analysis using the Knudsen model equations (decomposition of the spending on culture in Poland)

Source: own elaboration based on data from Table 3.

and p-value. Most assessments of the components of changes over time and sectoral components are here statistically significantly different from zero, at a 5%-level of significance. Spending on particular sectoral components in the analysed period were falling. A large increase in spending on culture from municipal budgets (7%) involved expenditures in the remaining category.

Conclusions

Despite the fact that the nominal spending from municipal budgets on culture in 2003–2016 in Poland grew, reaching a high-point in 2014, the share of this spending in total expenditure remained at a more or less stable level (slightly above 3%). An increase in the percentage share of cultural spending by municipalities in their total expenditure was visible only in the middle years of the analysed period (2011–2014). After this increase, in municipalities located in some voivodships, even falls in such shares were noted, e.g. in the municipalities of the Warmia-Masuria voivodeship the share of spending on culture in total expenditure fell from 3% in 2003 to 1.8% in 2016. This increase in the share of cultural spending followed by a decline may indicate that in 2011–2014 the municipalities of Poland made significant spending on culture, which could have been aimed at improving both hard and soft cultural infrastructure.

This situation, as well as the fact that the majority of municipalities in Poland in the analysed period had a higher share of expenditure on cultural purposes than average spending of this type for Poland, which was measured by means of location indicators, may indicate a change in the approach of local authorities to culture that manifests itself in the increasingly frequent perception of this sphere of the economy as a potential factor for the development of a municipality, rather than unnecessary budget expenditure.

On the other hand, the analysis using the Knudsen model revealed a disturbing tendency to decrease the share of municipal spending dedicated to culture in total expenditure. It is also impossible to explicitly indicate a component that would have the greatest impact on changes in the movements of these shares in the audited period. Only municipalities from five voivodships had positive assessment values in the case of regional growth component shares. These were municipalities from the following provinces: Wielkopolskie, Świętokrzyskie, Lubelskie, Małopolskie and Dolnośląskie. The occurrence of a clear downward trend in the share of cultural spending by municipalities in their total expenditure may, though not necessarily, mean a change in the direction of cultural policy of local governments in Poland. Most likely, the current direction of local government spending related to meeting infrastructural needs with regard to culture

and modernisation of already existing cultural organisations has been replaced by another, much more complex from the research point of view, direction, which is to increase cultural activity of local communities and fight the exclusion of certain social groups (e.g. large families or seniors) from participating in cultural events. In this case, expenses related to the implementation of the new objectives of cultural policies of local governments are not borne directly by the cultural sector and its institutions, but rather by the sectors of public expenditure, such as education and social assistance.

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