ARGUMENTA OECONOMICA

1 • 1995

Academy of Economics in Wrocław
Wrocław 1995

TABLE OF CONTENTS

ARGUMENTA OECONOMICA
No 1 • 1995
PL ISSN 1233-5835

Marek Obrębalski, Danuta Strahl

THE CONCEPT OF THE METHOD FOR APPRAISING THE ACTIVITIES OF COMMUNES[1]

1. THE SCOPE AND AIMS IN APPRAISING COMMUNES' ACTIVITIES

The process of the revival of Polish local self-government which started in 1990 has already brought some significant changes to the functioning of the local economy – particularly concerning the separation of the institution of communal assets, the structure of aims and powers of local authorities and the financing of self-government. Despite many imperfections and legal loopholes besides the more generally appreciated difficulties, the problems of local economy in a broad sense have gained more significance.

The activities of local self-governing powers in the sphere of both their own task and delegated ones are being controlled and at the same time appraised to a certain degree. The organ which, among other tasks, evaluates the activities of communes on a regional level is an autonomous regional council. However, the fulfillment of this task is not easy. This assessment should take under consideration the level of realization of its tasks by the commune in the given period of time and at the same time refer to the state of the segments of the local economy and the standard of living of the population; such a context of the appraisal is both more profound and more objective. The issue at stake here is the choice of the suitable method of the appraisal. Such a choice is not only a function of the aim and scope of the evaluation but also dependent on the quality and availability of the statistical and non-statistical data. It has to be pointed out that there is an obvious gap in the information available on the subject of the local

[1] This paper was published firstly in: Prace Naukowe AE [RW of WAE] 1994, No 669.

economy after 1990, and this remains so despite some efforts on the part of CSO (Central Statistical Office) to adjust some of their reports to include local economy changes.

2. THE METHODICAL ASPECT OF APPRAISAL

The evaluation of the communes' activities according to their fundamental tasks requires the use of a large set of identificators to describe the degree of their realization. It allows on one hand for a detailed and complex analysis and a reasonably thorough examination of the communes' activities, but on the other hand also creates some methodological obstacles which in turn somewhat restricts the comparability of those objects. Given a large number of identificators, one can perform a partial analysis which only allows an appraisal and ranking of communes on the basis of each measure of their activity taken separately. For a general analysis one has to employ more specialized tools belonging to multidimensional comparative analysis. Among them are so-called synthetic measures (see: Hellwig 1968 and Strahl 1978). Their basic principle is to quantify so-called complex events, i. e. those which require a large number of characteristics – identificators. Such measures are regulated, and their values belong to the numerical interval [0,1]. The interpretation of these aggregate indicators is simple and intuitive. The closer units of measure value indicate the higher level of the examined occurrence and therefore the higher estimate of the commune's functioning.

Using one of the synthetic measures (Strahl 1978) to evaluate communes' activities we can outline here the correct procedure.

We have a given set of objects – communes (denoted by $P_1, P_2, \ldots P_k$) where k is the number of appraised communes. For the purpose of their appraisal we accept four basic segments of the local economy, i.e.:

1) housing
2) local technical infrastructure
3) local social infrastructure
4) communes' authorities.

The fundamental criterion of choice for the scope of the appraisal is based on article 7 of the decree on local self-government (Dz. U. 1990 No 16, pos 95), which generally defines the own tasks for communes particularly when dealing with local matters. Each of the mentioned segments of the local economy is thus described by the set of identificators:

$$x^i_{k1}, x^i_{k2}, \ldots x^i_{km}; \quad \begin{matrix} k = 1, \ldots K \\ i = 1 \ldots n \end{matrix} \tag{1}$$

Values of those identificators are being observed in particular communes at the particular moments $t = 1,... T$. Those moments can be months, quarters, or years. The results of the observations create a numerical image of communes and can be written in a form of the matrix:

$$X^{it} = \begin{bmatrix} x^{it}_{11} & \dots & x^{it}_{1m} \\ & x^{it}_{kj} & \dots \\ x^{it}_{K1} & \dots & x^{it}_{Km} \end{bmatrix}_{K \times m} \qquad \begin{matrix} j = 1 \dots m \\ i = 1 \dots n \\ t = 1 \dots T \end{matrix} \tag{2}$$

where x^{it}_{kj} – numerical realization of the jth identificator in the kth commune in the ith sector at the moment t.

Among the identificators one has to distinguish for a proper construction of a synthetic measure the following features – stimulants, destimulants and nominants. Stimulants are such features whose **higher values indicate a higher level of the commune's development** in a given sector. Destimulants are such features whose **higher values indicate a lower level of the commune's development** in a given sector. Nominants are characterized by **certain levels of saturation and all the deviations from that level indicate development irregularities.** Further procedures in the construction of a synthetic measure require a definition of a model commune which becomes a basis of comparision for the appraised communes. The values of the model are created by an appropriate choice of the most suitable values existing in the examined objects-communes at the given time. Therefore:

$$x^{i}_{oj} = \begin{cases} \max\limits_{kt} x^{it}_{kj} & \text{for } j \in S \\ \min\limits_{kt} x^{it}_{kj} & \text{for } j \in D \\ \text{nom } x^{it}_{kj} & \text{for } j \in N \end{cases} \tag{3}$$

where:
S – stimulants
D – destimulants
N – nominants

Using suitable transformations we can obtain standardized values of matrix X described by:

$$X' = \left[x'^{it}_{kj} \right]_{K \times m} \tag{4}$$

where:

$$x'^{it}_{kj} = \frac{x^{it}_{kj}}{\max\limits_{kt} x^{it}_{kj}} \qquad \text{for } j \in S$$

$$x'^{it}_{kj} = \frac{\min\limits_{kt} x^{it}_{kj}}{x^{it}_{kj}} \quad \text{for } j \in D$$

$$x'^{it}_{kj} = \frac{\text{nom } x^{it}_{kj}}{x^{it}_{kj}} \quad \text{for } j \in N \quad \text{and} \quad \text{nom } x^{it}_{kj} \leq x^{it}_{kj}$$

$$x'^{it}_{kj} = \frac{x^{it}_{kj}}{\text{nom } x^{it}_{kj}} \quad \text{for } j \in N \quad \text{and} \quad x^{it}_{kj} \leq \text{nom } x^{it}_{kj}$$

For every sector (in the sphere of the examined segments of the local economy) of the commune's activities we construct a synthetic measure for a particular moment of observation according to the formulae:

$$s^{it}_k = \frac{\sum_{j=1}^{m} x'^{it}_{kj}}{m} \tag{5}$$

As we can see, $s^{it}_k \in [0, 1]$. The measure for appraising totally the activities of the commune on the basis of examined sectors has the form:

$$s^t_k = \frac{\sum_{i=1}^{n} s^{it}_k}{n} \tag{6}$$

This measure is also standardized, its value belonging to the numerical interval [0,1]. Moreover, this measure can be used for the dynamic analysis to quantify the communes' activities in a particular time interval. Such a measure has the form:

$$s^i_k = \frac{\sum_{t=1}^{T} s^{it}_k}{T} \tag{7}$$

or

$$S_k = \frac{\sum_{t=1}^{T} s^t_k}{T} \tag{8}$$

Both measures (7) and (8) are standardized and belong to the interval [0,1]. Calculating values of measures (5) and (6) for their sequence of moments of observation allows to establish traditional indicators of dynamism for appraising

the speed of development of the examined sectors of the communes' activities or the total development of these units.

3. THE APPRAISAL OF THE STATE AND ACTIVITIES OF THE COMMUNES IN THE JELENIA GÓRA DISTRICT IN 1991

The set of evaluated objects contains 40 communes from the Jelenia Góra region. We assumed the set of 63 features-identificators concerning four of the above mentioned elements of the local economy.

1. Housing

x^1_{k1} – number of persons per flat,

x^1_{k2} – number of persons per room,

x^1_{k3} – average living space of the flat in sq. metres per person,

x^1_{k4} – number of rooms completed per 1,000 inhabitants,

x^1_{k5} – % of council flats in the communes' total housing stock,

x^1_{k6} – average living space of council flat in sq. metres,

x^1_{k7} – % of privately owned flats in the housing stock,

x^1_{k8} – number of rooms in council flats completed per 1,000 population,

x^1_{k9} – number of rooms in council flats built per 1,000 population,

x^1_{k10} – % of council flats after the 1991 major overhaul,

x^1_{k11} – % of council flats modernized after 1991,

x^1_{k12} – number of applications for a council flat per 1,000 population,

x^1_{k13} – number of council flats given for habitation per 1,000 population.

2. Local technical infrastructure

– roads and communications

x^2_{k1} – % length of local & city roads with improved hard surface,

x^2_{k2} – % of length of roads repaired in 1991,

x^2_{k3} – amount spent for maintenance per 1 km of roads and bridges (thousands of zls),

x^2_{k4} – length of roads per 1 km^2 of the commune's area,

x^2_{k5} – telephones per 1,000 population,

x^2_{k6} – number of post offices per 10,000 population,

– water supply and sanitation

x^3_{k1} – % of population in flats connected to the water-supply network,

x^3_{k2} – length of the water-supply network in metres per 1,000 population,

x^3_{k3} – water supplied for household in m^3 per person per year,

x^3_{k4} – % of population in flats with sanitation,

x^3_{k5} – length of sanitation network in m per 1,000 population,

x^3_{k6} – capacity of the local sewage plant in m^3/d per 1,000 population,

x^3_{k7} – share of biologically treated sewage in the total amount of treated sewage.

3. Local social infrastructure

– social assistance

x^4_{k1} – number of people given social assistance per 1,000 population,

x^4_{k2} – employment in the local centres of social assistance per 1,000 population who receive it,

x^4_{k3} – the cost of assistance per person in thousands of zl for commune's budget,

x^4_{k4} – cost to the state budget of social assistance per person in thousands of zl,

– culture

x^5_{k1} – number of volumes in the local libraries per 1,000 population,

x^5_{k2} – amount of books lent in volumes per 1,000 population,

x^5_{k3} – spending from communes' budget on libraries in thousands of zl per 1 person,

x^5_{k4} – number of cinema seats (permanent) per 1,000 population,

x^5_{k5} – number of cinema venues (permanent) per 1,000 population,

x^5_{k6} – size of space[2] used for cultural activities in cultural centres, clubs etc. in m^2 per 1,000 population,

x^5_{k7} – expenditure by the commune on the above establishments in thousands of zl per 1,000 population,

– education

x^6_{k1} – number of children (3–6 years old) in kindergartens per 1,000 children,

x^6_{k2} – number of children in kindergartens per one full-time teacher,

[2] For basic activities.

x_{k3}^{6} – number of children in kindergartens per one unit,

x_{k4}^{6} – number of children in kindergartens attached to primary schools per one unit,

x_{k5}^{6} – primary school pupils per one unit,

x_{k6}^{6} – number of primary school pupils per one full-time teacher,

x_{k7}^{6} – shift system in primary schools,

x_{k8}^{6} – primary schools as the own task of the commune,

– health care

x_{k1}^{7} – number of population in the commune per one health centre,

x_{k2}^{7} – number of doctors per 10,000 population,

x_{k3}^{7} – number of dentists per 10,000 population,

x_{k4}^{7} – number of nurses per 10,000 population,

x_{k5}^{7} – number of population per pharmacy,

x_{k6}^{7} – places in crèches per 1,000 children aged 0–2,

x_{k7}^{7} – out-patient medical services as the task given to the commune,

x_{k8}^{7} – expenditure from the communal budget for out-patient health care (beside that realized from the means given for the above purposes) in thousands of zl per person,

x_{k9}^{7} – expenditure from the communal budget for crèches in thousands of zl per one place.

4. Local authorities

x_{k1}^{8} – expenses from the communal budget for autonomous administration in thousands of zl per one person,

x_{k2}^{8} – share of expenditure for tasks given in the general expenditure from the communal budget,

x_{k3}^{8} – white-collar workers in communal offices per thousand inhabitants,

x_{k4}^{8} – number of resolutions of the communal councils per one councillor,

x_{k5}^{8} – % of resolutions of communal councils approved by the superior authority,

x_{k6}^{8} – % of local authorities decisions in matters of accommodation, appealed against but upheld by the Appeals Committee of the Regional Council,

x_{k7}^{8} – % of local authorities decisions in matters of surveying, appealed against but upheld by the Appeals Committee of the Regional Council,

Table 1
Values of the synthetic measure for the appraisal of the activities of communes in the Jelenia Góra district in 1991

Position	Name of a commune	Type of commune	Value of the synthetic measure
1	Świeradów Zdrój	m	0.8080
2	Szklarska Poręba	m	0.7966
3	Karpacz	m	0.7845
4	Zgorzelec	m	0.7370
5	Lubań	m	0.7225
6	Kowary	m	0.7150
7	Jeżów Sudecki	w	0.6982
8	Wleń	mw	0.6777
9	Platerówka	w	0.6709
10	Jelenia Góra	m	0.6541
11	Bolków	mw	0.6475
12	Kamienna Góra	m	0.6340
13	Bolesławiec	m	0.6334
14	Wojcieszów	m	0.6244
15	Pieńsk	mw	0.6241
16	Zawidów	m	0.6209
17	Janowice Wielkie	w	0.6138
18	Bogatynia	mw	0.6088
19	Gryfów Śląski	mw	0.6050
20	Podgórzyn	w	0.5989
21	Piechowice	m	0.5987
22	Siekierczyn	w	0.5937
23	Świerzawa	mw	0.5932
24	Zgorzelec	w	0.5864
25	Lwówek Śląski	mw	0.5814
26	Lubawka	mw	0.5789
27	Mysłakowice	w	0.5726
28	Osiecznica	w	0.5667
29	Olszyna	w	0.5636
30	Stara Kamienica	w	0.5521
31	Sulików	w	0.5507
32	Kamienna Góra	w	0.5464
33	Lubomierz	mw	0.5463
34	Leśna	mw	0.5403
35	Nowogrodziec	mw	0.5349
36	Mirsk	mw	0.5260
37	Węgliniec	mw	0.5048
38	Marciszów	w	0.5024
39	Bolesławiec	w	0.4837
40	Lubań	w	0.4420

m = urban, w = rural, mw = urban – rural.
Source: own calculations.

x_{k8}^{8} – % of local authorities decisions in matters of taxation, appealed against but upheld by the Appeals Committee of the Regional Council,

x_{k9}^{8} – % of local authorities decisions in other matters, appealed against but upheld by the Appeals Committee of the Regional Council.

Based on the information obtained from the Regional Office of Statistics (WUS) in Jelenia Góra, the District Office of Jelenia Góra and the Appeals Committee of the Regional Council of the communes in the Jelenia Góra district, particular objects of appraisal were given values of listed features-identificators for 1991[3]. Using, in turn, the above-mentioned procedure we have obtained synthetic appraisals of the communes' activities within given sectors and the total evaluation (*Diagnoza...*, 19–28). The latter has been included in Table 1. The total evaluation of the communes' activities in 1991 within the accepted sectors of the local economy allows to assume that the communes differ in a moderate way. The value of synthetic measure of appraisal given to the 'best' commune – Świeradów Zdrój (s_k = 0.8080) is 1.8 times higher then the one established 'last' in the ranking list (the rural commune of Lubań). One has to note that the former's share of synthetic measure's worth of model value is 80.8% while the latter's is only 44.2%.

CONCLUSION

Although the evaluation of activities in the communes of Jelenia Góra region presented here concerns only one period (1991) but the presented method allows for including the dynamic aspect. Changes in the values of the synthetic measure of evaluating communes in time can point out both positive and negative tendencies in the development of certain segments of the local economy. The results suggest also that further examination of the analysed problems should lead to, amongst others:

– the giving of suitable preference to some features-identificators of the appraisal,

– broadening the set of identificators by the aspect of the evaluation of quality,

– wider inclusion of the reasons in the interpretation of the quantified appraisal.

However, the realization of these undoubtedly correct directions for improving the methodology of the evaluation of the communes' activities requires a substantial increase in the amount of the information available.

[3] Presenting values of the particular identificators of evaluation on the level of communes is not possible here for technical reasons.

REFERENCES

Diagnoza stanu wybranych elementów gospodarki lokalnej w gminach województwa jeleniogórskiego w 1991 r. [*Diagnosis of State of Selected Elements of Local Economy in the Communes of the Jelenia Góra District in 1991*]. OBNiU 'Economicus' 1992 (in typescript form only), Jelenia Góra.

Hellwig Z. (1968): *Zastosowanie metody taksonomicznej do typologicznego podziału krajów ze względu na poziom ich rozwoju oraz zasoby i strukturę wykwalifikowanych kadr* [*Implementing the Taxonomic Method for Typological Distribution of Countries Based on their Development, Resources and Structure of Qualified Personnel*], 'Przegląd Statystyczny' ['Statistical Review'] No 4.

Strahl D. (1978): *Propozycja konstrukcji miary syntetycznej* [*The Proposal for Construction of a Synthetic Measure*], 'Przegląd Statystyczny' ['Statistical Review'] No 1.