The System Approach to Grants and Tax Revenues of the Czech Municipalities

KAŠPAROVÁ MILOSĽAVA,
Institute of System Engineering and Informatics
Faculty of Economics and Administration, University of Pardubice
Studentská 84, 532 10 Pardubice
CZECH REPUBLIC

Abstract: Public administration structure, financing and activities of self-governments can be different in other countries, but goals of every public administration are similar. Briefly speaking the main goal is to secure adequate and continuous financing inside. This paper deals with the system approach to grant and tax revenues of the Czech municipalities. It focuses on public administration system, describing of tax revenues, grants, and situation in the Czech Republic and shows a process of grant realization. Creation of design of grant criteria objectification model is part of this paper too.

Key-words: public administration, municipality, grant, tax, system, system approach

1 Introduction

Public Administration can be broadly described as the development, implementation and study of branches of government policy. Public Administration is linked to pursuing the public good by enhancing civil society and social justice. By [10] it is government in action – the management of public affairs or the implementation of policies and there we can find various definitions. Generally it is possible to say, the public administration presents people and activities that are part of organization process.

Systems theory [10, 12] views an organization as a complex set of dynamically intertwined and interconnected elements, including its inputs, processes, outputs, feedback loops, and the environment in which it operates and with which it continuously interacts. Any change in any element of the system causes changes in other elements. The interconnections tend to be complex, dynamic, and often unknown. Thus, when management makes decisions involving one organizational element, unanticipated impacts usually occur throughout the organizational systems. The Fig.1 shows the public administration as the system.

This system is divided into three distinct parts [12]: inputs, processes and outputs. They are surrounded by and environment and include a feedback mechanism (for example control of an observance of the rules, term, fulfillment of obligations, payment of taxes, measurements of citizens satisfaction etc.). In addition, human decision-makers are considered part of this system. Incomes and revenues, laws and regulations, knowledge and experiences of workers, various data and information and other sources are inputs there. Processes are realized on the basis of various tools, activities, procedures and decisions. In public administration many processes related to economical, legislative and social areas are under way. Performances, consequences of decisions, protection of public interest and security of the necessities of life of citizens etc. are outputs of this public administration system.

Fig. 1 System of the public administration

Because organizations are adaptive systems that are integral parts of their environments, they must adjust to change in their environment if they are to survive. Norbert Wiener’s model of an organization as an
adaptive system epitomizes the basic theoretical perspectives of the systems perspective. The basic concept behind cybernetics is self-regulation, biological, social, or technological systems that can identify problems, do something about them, and then receive feedback to adjust themselves automatically [10]. This model is in the Fig. 2.

Fig. 2 Norbert Wiener’s model of an organization as an adaptive system

Public administration system has not elements of self-regulation. The regulation is at least secured by tools, decisions of decision makers at the various levels of public administration and influence of environment.

Every organization has its structure that defines elements, their roles, functions and operating principles. The public administration is comprised state administration bodies, territorial self-government bodies and their relations. The state administration is directly or mediately regulated by the central government. Characteristic features of this state administration are the restricted decision making autonomy, vertical hierarchical structure and subordination of lower state administration bodies to higher bodies. The territorial self-government is a spatially defined function unit with power to make decisions. Municipalities and regions are an example of this government. At the territorial self-government level in the Czech Republic is a hybrid model. The state government and territorial self-government (both governments) at the level of municipalities and regions are realized under the one territorially administrative unit. If the self-government bodies perform the state government it is concerned about the transfer state administration. The Czech municipalities differ in range of the state administration execution in transfer competency. The structure of the public administration in the Czech Republic is in the Fig. 3, more about Czech municipalities, regions and public administration for example in [11, 15, 16].

Goals of this paper are:

- To describe the two types of the municipalities’ revenues used in the Czech Republic. It means to focus to grants and tax revenues;
- On the basis of system approach to describe grant system of the Czech municipalities;
- To create a design of grant criteria objectification model.

2 The Revenues of the Municipalities

Transfers and grants $P_1$, tax revenues $P_2$ and non-tax revenues $P_3$, credits and loans $P_4$ are the basic groups of the municipalities’ revenues. We can note revenues as a set $P_M$ containing these groups of above-mentioned revenues $P_M = \{P_1, P_2, P_3, P_4\}$, more about financing of public administration in Czech Republic, public service financing and financial system is for example in [4, 8,9].

Fig. 4 Basic groups of the municipalities’ revenues

Tax revenues $P_2$ are one of the most important revenues of Czech municipalities. They consist of shared and entrusted taxes and influence the financial stability of municipalities.

The shared taxes decrease a fiscal unbalance among the territorial (local) self-governments. The municipality or region makes decision about their usage. The state and local self-government share the same tax base.

A tax calculation is statewide determined on the base of the related tax Acts and territorial self-governments
can not influence it. The Act determines the share of municipalities on statewide collected taxes (the municipalities – 21.4%, regions 8.92%). By calculation of percentage \( s_1 \) that determines share of \( n \) Czech municipalities of national gross yield (NGY) of tax it is considered four big municipalities \( o_i \) for \( i = 1, 2, 3, 4 \) (there are Prag \( o_1 \), Plzen \( o_2 \), Ostrava \( o_3 \) and Brno \( o_4 \)) and the rest of municipalities \( o_i \) for \( i = 5, 6, \ldots, n \). This percentage \( s_1 \) for the rest municipalities is calculated by [18] by following formulas and criteria:

\[
s_1 = \left( \frac{KV}{\sum_{i=1}^{n} KV_i} \right) 0.03 + \left( \frac{PO}{\sum_{i=1}^{n} PO_i} \right) 0.03 + \left( \frac{a_i}{\sum_{i=1}^{n} a_i} \right) 0.94 \cdot s_1, \tag{1}
\]

where \( KV_i \) is cadastral area of municipality \( o_i \) for \( i = 1, 2, \ldots, n \) (criterion 1), \( PO_i \) is number of inhabitants in municipality \( o_i \) for \( i = 1, 2, \ldots, n \) (criterion 2), \( a_i \) is multiple of gradation for municipality \( o_i \) for \( l = 1, 2, 3, 4 \) taken values by [18] and \( i = 5, 6, \ldots, n \) (criterion 3), \( ts \) is total percentage with that the rest of municipalities participates on the part of the NGY. It is possible to determine by the following formulas:

\[
ts_5 = \frac{b_5 \sum_{i=1}^{n} PO_i}{b_5 PO_1 + b_2 PO_2 + b_3 PO_3 + b_4 PO_4 + b_5 \sum_{i=1}^{n} PO_i}, \tag{2}
\]

\[
ts_5 = \frac{b_5 \sum_{i=1}^{n} PO_i}{\sum_{i=1}^{n} b_i PO_i}, \tag{3}
\]

where \( b_5 \) is rate for conversion for the rest of municipalities and \( b_q \) for \( q = 1, 2, 3, 4 \) are values of rates for conversion for big municipalities (Praha \( o_1 \), Plzeň \( o_2 \), Ostrava \( o_3 \), a Brno \( o_4 \)) by [18].

The percentage \( s_5 \), that determines share of big municipalities Prag \( o_1 \), Plzen \( o_2 \), Ostrava \( o_3 \) a Brno \( o_4 \) to proportional part of the NGY of tax it is possible to calculate by this following formula:

\[
s_5 = \left( \frac{KV}{\sum_{i=1}^{n} KV_i} \right) 0.03 + \left( \frac{PO}{\sum_{i=1}^{n} PO_i} \right) 0.03 + \left( \frac{b_5 PO}{\sum_{i=1}^{n} b_i PO_i} \right) 0.94 \cdot s_5, \tag{4}
\]

where \( b_q \) for \( q = 1, 2, 3, 4, 5 \) rate for conversion for municipalities \( o_q \), \( KV_i \) for \( i = 1, 2, 3, 4 \) is cadastral area for the big municipalities \( o_1, o_2, o_3 \) and \( o_4 \), and \( PO_i \) for \( i = 1, 2, 3, 4 \) is number of inhabitants in municipality \( o_i \), more in [17, 18, 19]. This share is their revenue.

There are two types of the share taxes allocation [9]: derivational and no derivational types. The second type is typical for the Czech Republic. The share is determined from total revenues of tax and divides by a criterion or criterions, for example number of people lived in municipality or cadastral area of the municipality.

For example personal income tax and value added tax (VAT) belong to the share taxes in the Czech Republic. Because about their usage self-governments (municipalities and regions) decide, they support decentralization and an increase of responsibility relative to their usage.

In accordance of their usage the shared taxes have form of a general (unconditional) grant but the difference is that in case of worse economic process the level of share on tax yield has not to be filled.

In some countries they are known as transfers and are not part of tax revenues of the territorial self-governments.

By [9] it is possible to find different opinions what are transfers (grants) and what are tax revenues. Grants to the municipalities and regions are internal transfers. Unclearness is in case of the share tax. If the territorial self-government can influence either a tax rate or the tax base of the tax it is the tax revenue. If higher level of the government has influence and control the tax rate or tax base and collected revenues are only relocated (the shared taxes) or allocated it is transfer.

**Grant** transfer spending power form one government to another. Grants can reduce the problems created by fiscal disparity, and reduced special problems associated with regional economic decline etc. Basic types of grants are for example categorical and bloc grants. Categorical grants finance specific and narrowly defined programs, usually limited to spending for certain activities. In [6] are these types of categorical grants:

- **Formula** (in which aid is distributed according to a legislatively or administratively determined formula. Formula elements may include: population, population in certain demographic categories, per capita income, unemployment, housing categories, energy use, highway lane miles etc.;
- **Project** (in which aid is distributed at the discretion of the administrator for particular project. These grants are usually awarded on a competitive basis from applications made to support a particular proposal from a local government or other entity);
- **Project/formula** (in which aid is distributed at the discretion of the administrator within constraints set by a formula that limits amounts awarded in an area).

Projects are evaluated on the specific factors and criteria, such as the creativity on novelty of the project approach or the possibility that results may be used elsewhere. Selection criteria and weighting among factors is usually published with program
announcements. In [6] we can find particular difficulties of this categorical grant system.

Block grants are usually distributed to general-purpose government according to a statutory formula to finance activities in a broad function area. Recipients have considerable discretion in how to spend the money. Among the features of these grants are that [6] “aid is authorized of a wide range of activities within a broadly defined function area; recipients have substantial discretion to identify problems, design programs, and allocate resources; administrative, fiscal reporting, planning, and other imposed requirements are limited to those necessary to ensure that national goals are being accomplished; aid is distributed on the basis of statutory formula with few, if any, matching requirements and, historically, spending has been capped”.

### 3 The Grant System of the Czech Municipalities

Typology of grants that is typical for the Czech Republic we can see for example in [8, 9].

There is dividing of categorical (purpose) grant into grant with and without a financial participation. This grant with the financial participation forces the territorial self-governments to be more responsible for their expenditures and to increase their own incomes. Furthermore we can divide grant by the way of a grants acquisition and in practice clerks works with capital (for investment) and common grants, too. Elements of decentralization respect more block grants. However, for their usage we need transparent and stable system of criteria (for allocation of grants).

However, nowadays in the Czech Republic categorical grants are poured into municipalities. For example we can see it in the Fig. 5. (There are the categorical grants 82 060 548 CZK and block grants 305 000 CZK in one of the Czech municipalities in 2007. About 100 000 inhabitants live there). Most of categorical grants finances repeated expenditures that are connected with a delegacy of providing some services only partially. These grants cover only the social security benefit expenditures. It motivates the municipalities to an expenditure good management; on the other hand this type of grants (for example per inhabitant) does not motivate municipalities to an idle capacity accumulation [9]. The providing grant system is in the Fig. 6 and Fig. 7. In the Fig. 6 we can see process of realization grant on the basis of provider grant financial resources.

There are four elements: provider $a_1$ (donor) of grant (for example European Union, region, the state), the municipality $a_2$ (the Fig. 6), measurement $a_3$ and comparison $a_4$. Provider $a_1$ is the controller and municipality $a_2$ is controlled element of system. Elements $a_3$ and $a_4$ represent activities in the grant process.

#### Fig. 6 Process of grant realization

By the system approach [1,12] it is possible to define this system $S_1$ as a set containing inputs $I$, outputs $Q$, elements $A$ and set of relations $K=\{k_{12}, k_{23}, k_{31}, k_{14}, k_{42}\}$ between them $S_1=\{I, A, K, Q\}$, where $I$ is set of inputs $I=\{i_1\}$, $A$ is set of elements $A=\{a_1, a_2, a_3, a_4\}$, and $Q$ is set of system outputs $Q=\{q_1\}$.

If the municipality want to get grant it is necessary to fulfill needed criteria, e. g. Municipality’s strategic plan, size of a debt service.

#### Fig. 7 The system of providing

If the municipality completes required criteria it can ask for grant. The municipality makes request with annexes to provider. In second step is grant proceeding.
Result is an acceptance or non-acceptance of grant request. On the basis of positive result contract between the municipality and provider is made. The contract contents contractors, subject of the contract, financial conditions, consequences of non-performance of the contract and final provision. Afterwards it is possible to use of financial resources and to realize the project. The last steps are an evaluation of project and final account.

Disadvantage of this type of grant is necessity to use financial resources only to exactly defined aim. Under-used grant municipality can not use otherwise. In the Czech Republic the situation in the grant system (regarding both types of grant: block and categorical) is not too transparent.

In European Union countries is trend to use block grants. Necessary of public services indicators and standards for grant providing is underlined.

By the system approach [12] it is possible to define this system $S_2$ as a set containing inputs $I$, outputs $Q$, processes $P$ and relations $K$ between them $S_2 = \{I, P, K, Q\}$, where $I$ is set of inputs $I = \{i_1, i_2, ..., i_r\}$ and where $i_1$ is grant request, $i_2$ to $i_r$ are annexes related with input $i_1$; $P$ is set of processes $P = \{p_1, p_2, p_3\}$, where $p_1$ is grant proceeding, $p_2$ is evaluation of grant proceeding, and $p_3$ is decision on the basis of previous processes; $Q$ is set of system outputs $Q = \{q_1, q_2\}$, where $q_1$ is acceptance and $q_2$ is non-acceptance of the grant request. System output is depended on a result of decision making process.

3 Design of Grant Criteria Objectification Model

Therefore it is inevitable to define in this area a set of generalized criteria. Design of model to collection and objectification that will be realized is in the Fig. 8.

In this model we can see these eight steps. Firstly it is necessary to realize status quo analysis (present conditions of development). It contents study of many material about financing of municipalities, Acts and rules, financial reports, reports of Ministry of finance, state budget, budgets of municipalities etc.). Study of measurement of phenomena in public administration is part of this step, too. On the basis of the first step it is possible to create list of criteria and formulas. In order to data collection it is appropriate to create the questionnaire and realize a survey. Much information about creation good questionnaire and surveys and analysis of result including various methods we can find for example in [7, 14]. The survey will be focused to selected Czech municipalities (number of Czech municipalities was 6249 in year 2006) and to applied criteria in this grant system. The results of survey will be evaluated and together other information will be fundament to create grant criteria objectification model. In this step will be used selected statistical methods and methods of computational intelligence, e.g. hierarchical cluster methods, neural networks, fuzzy inference systems, correlation analysis). Applications of these selected methods we can find for example in [2, 3, 5, 13, 14]. The output of this model is design of applicable criteria in grant system of municipalities.

4 Conclusions

By proportion of grant providing (block and categorical) in the Czech territorial self-government the categorical grants are much more used. The proportion is 90 % to 10 % [9]. The regions have restricted competency in decision making and have to respect decisions of government and use grants by the strictly determined aim. Nowadays is pursuit of an increase of block grants usage and approximate to European Union. The goal is to strengthen competency in decision making of the territorial self-government regarding to way of block grant usage.

5 Acknowledgement

This paper was created with a support of the Grant Agency of the Czech Republic; grant Nr. 402/08/P164 with title Modeling of Subsidy Distribution Processes in Public Administration.
References:


