

UDC 351

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## **METHODOLOGICAL APPROACH TO DETERMINING THE MAIN FACTORS OF INFLUENCE ON THE PUBLIC ADMINISTRATION SYSTEM ECONOMIC DEVELOPMENT**

**Abstract.** Public administration should be considered as a certain influence on the part of state authorities and local self-government on the vital activity of individual regions and organizations in order to create a favorable economic environment. Today there is an urgent need for the development of the public administration system, which acts as a powerful mechanism in the state apparatus in order to promote economic development and growth. But like any other control system, it is influenced by both factors and factors that can always have positive consequences. The current conditions that have developed in the world have significantly stopped economic growth and only contributed to its destructuring. Ukraine is no exception in this situation and has a number of problems that in one way or another have a negative impact on the public administration system for economic development. The aim of our research is to form a methodological approach to the definition and compilation of the main factors of influence on the public administration system of economic development. During the research, we used the methods of expert assessment to determine the main factors of influence on the public administration system of economic development and the modeling methodology for the hierarchical ordering of these factors according to the application of graph theory. As a result of the study, we presented a methodological approach to determining and compiling the main factors of influence on the public administration system of economic development, which, unlike the existing ones, provides for the use of the expert assessment method and modeling methodology for the hierarchical ordering of these factors according to the application of graph theory. Our research can have a practical aspect of application in public authorities. The research has limitations, which can be traced in the fact that only the economic environment of Ukraine was used as an object of research and in subsequent research, attention should be focused on the international level.

**Keywords:** factors of influence, methodological approach, public administration, economics, model.

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## **МЕТОДИЧНИЙ ПІДХІД ДО ВИЗНАЧЕННЯ ОСНОВНИХ ЧИННИКІВ ВПЛИВУ НА СИСТЕМУ ПУБЛІЧНОГО УПРАВЛІННЯ РОЗВИТКУ ЕКОНОМІКИ**

**Анотація.** Публічне управління слід розглядати як певний вплив з боку органів державної влади і місцевого самоврядування на життєдіяльність окремих регіонів та організацій з метою формування сприятливого економічного середовища. На ubнішній день існує нагальна потреба в розвитку системи публічного управління, яке виступає вагомим механізмом у державному апараті для того, щоб сприяти економічному розвитку та зростанню. Але як і будь-яка інша система управління, на неї здійснює вплив факторів і чинники, які завжди можуть мати позитивні наслідки. Умови, які склалися у світі, суттєво зупинили економічне зростання і лише сприяли його деструктуризації. Україна не виняток у цій ситуації і має низку проблем, які так чи інакше здійснюють негативний вплив на систему публічного управління розвитком економіки. Метою нашого дослідження є формування методичного підходу до визначення і впорядкування основних чинників впливу на систему публічного управління розвитком економіки. Під час здійснення дослідження було використано методи експертного оцінювання для визначення основних чинників впливу на систему публічного управління розвитком економіки та методологію моделювання для ієрархічного впорядкування цих чинників із застосування теорії графів. У результаті проведеного дослідження було представлено методичний підхід до визначення і впорядкування основних чинників впливу на систему публічного управління розвитком економіки, який, на відміну від наявних, передбачає застосування методу експертного оцінювання та методологію моделювання для ієрархічного впорядкування цих чинників із застосування теорії графів. Наше дослідження може мати практичний аспект застосування в органах державної влади. Дослідження має обмеження, які прослідковуються в тому, що лише економічне середовище України було використано як об'єкт дослідження і в подальших дослідженнях слід зосередити увагу на міжнародному рівні.

**Ключові слова:** чинники впливу, методичний підхід, публічне управління, економіка, модель.

Формул: 5; рис.: 2; табл.: 3; бібл.: 11.

**Introduction.** Modern processes taking place in Ukrainian society are characterized by a variety of directions of influence: on the one hand, they are unstable, transitive, stagnant, on the other — modernization, reformatory, reviving. Modern science is trying to consider approaches to stabilizing processes in the political, economic, social and cultural environment by proposing new ways to use the existing management tools, new management models both in the field of public authority (public administration) and in public administration, as well as mechanisms, implementation which provides for a new vision of the relationship «power — public» and is based on the national archetype.

The current conditions that have developed in the world have significantly stopped economic growth and only contributed to its destructuring. Ukraine is no exception in this situation and has a number of problems that in one way or another have a negative impact on the public administration system for economic development.

**Research analysis and problem statement.** The problems that accompany the public administration system of economic development and how a number of negative factors and factors can contribute to this have been investigated by many international scientists, in particular: Vilys [1], Vilerts [2], Alesina [3], Algan [4], Campos [5], Caponi [6], Gomes [7] and others [8—11].

Keeping due to the scientific contribution of scientists and practitioners, it should be noted that today the question of the formation of a methodological approach to the definition and compilation of the main factors of influence on the public administration system of economic development remains open and urgent.

**The task** is to form, according to the proposed methodological approach, an appropriate model of hierarchical ordering of the impact of key factors on the system of public management of economic development.

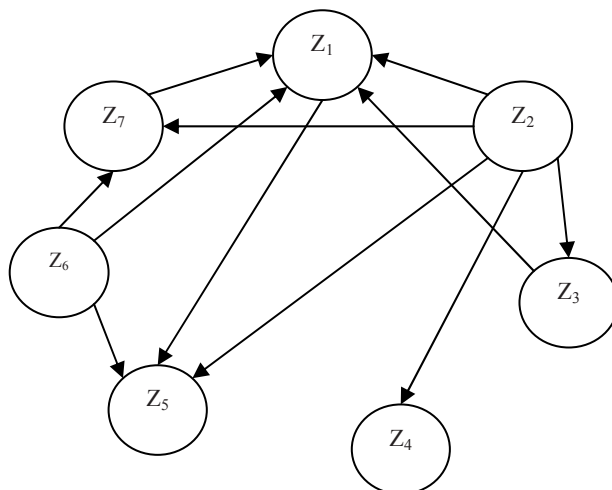
**The main purpose of the study is** to form a methodological approach to the definition and compilation of the main factors of influence on the public administration system of economic development.

**The research methodology.** During the study, we used the methods of expert evaluation to determine the main factors influencing the system of public management of economic development and modeling methodology for the hierarchical organization of these factors using graph theory.

**Results of the research.** As a result of theoretical and practical research and expert assessment and a survey of leading experts in the field of public administration and economic development, we have identified the following factors that have the most negative impact on the public administration system of economic development (mathematical designations were established for each of the factors):

- Coronavirus and its consequences ( $Z_1$ );
- Political situation in the country ( $Z_2$ );
- Inflationary processes ( $Z_3$ );
- Regional tensions ( $Z_4$ );
- Military aggression ( $Z_5$ );
- Trust in Banking Systems ( $Z_6$ );
- Trust in authority ( $Z_7$ ).

Graph theory is used to form a relationship graph. Suppose that the set of factors we have identified will have a set  $Z = \{z_1, z_2, \dots, z_n\}$ . From this set we choose a subset  $Z_1 \in Z_2$  of the most important factors. As a result, we get a graph of relationships between certain factors (*Fig. 1*).



**Fig. 1. Graph of connections between the main factors of influence on the public administration system of economic development**

Therefore, we form a binary matrix of dependence A for the set of vertices  $Z_1$  according to formula (1):

$$a_{ij} = 1, \text{ if the vertex } i \text{ depends on the vertex } j; \text{ otherwise the value will be } 0; \quad (1)$$

Matrix A of dimension  $7 \times 7$  is presented in Table 1.

Table 1

**Matrix A**

		1	2	3	4	5	6	7
		$Z_1$	$Z_2$	$Z_3$	$Z_4$	$Z_5$	$Z_6$	$Z_7$
1	$Z_1$	0	0	0	0	1	0	0
2	$Z_2$	1	0	1	1	1	0	1
3	$Z_3$	1	0	0	0	0	0	0
4	$Z_4$	0	0	0	0	0	0	0
5	$Z_5$	0	0	0	0	0	0	0
6	$Z_6$	1	0	0	0	1	0	1
7	$Z_7$	1	0	0	0	0	0	0

So, as a result, based on the data of the matrix A, we build a matrix of reach. We form a binary matrix  $(I + A)$ , where I is a unit matrix (2):

$$(I + A)^{k-1} \leq (I + A)^k = (I + A)^{k+1}. \quad (2)$$

The reachability matrix for our modeling is presented in Table 2.

Table 2

**The reachability matrix**

		1	2	3	4	5	6	7
		Z <sub>1</sub>	Z <sub>2</sub>	Z <sub>3</sub>	Z <sub>4</sub>	Z <sub>5</sub>	Z <sub>6</sub>	Z <sub>7</sub>
1	Z <sub>1</sub>	1	0	0	0	1	0	0
2	Z <sub>2</sub>	1	1	1	1	1	0	1
3	Z <sub>3</sub>	1	0	1	0	0	0	0
4	Z <sub>4</sub>	0	0	0	1	0	0	0
5	Z <sub>5</sub>	0	0	0	0	1	0	0
6	Z <sub>6</sub>	1	0	0	0	1	1	1
7	Z <sub>7</sub>	1	0	0	0	0	0	1

All elements presented in *Table 2* must meet the requirement (3):

$$a_{ij} = 1, \text{ if with } i \text{ it is possible to get to } j, \text{ otherwise, } 0; \tag{3}$$

Thus, if  $z_j$  is achieved with  $z_i$ , and there is a path in the graph that leads from the vertex  $z_i$  to the vertex  $z_j$ , then such a vertex is called achievable  $S(z_i)$ . Similarly, the vertex  $z_i$  is the precursor of the vertex  $z_j$  if it reaches its vertex  $P(z_i)$  (4):

$$R(z_i) = S(z_i) \cap P(z_i), \tag{4}$$

Note that also, an additional condition is to ensure equality (5):

$$P(z_i) = R(z_i). \tag{5}$$

Thus, the implementation of the above actions forms the first level of the hierarchy of the factors we have defined. To determine it, we will form a corresponding calculation table (*Table 3*).

Table 3

**Calculation table for model construction**

I	S(z <sub>i</sub> )	P(z <sub>i</sub> )	S(z <sub>i</sub> ) ∩ P(z <sub>i</sub> )
1	1, 5	1, 2, 3, 6, 7	1
2	1, 2, 3, 4, 5, 7	2	2
3	1, 3	2, 3	3
4	4	2, 4	4
5	5	1, 2, 5, 6	5
6	1, 5, 6, 7	6	6
7	1, 7	2, 6, 7	7

Thus, the specified equality (5) is fulfilled by 2 and 6 factors, and it is those factors that form the lowest level of influence on the system of public management of economic development. This process is repeated until it is finally determined which factors have the greatest influence and which do not, due to their removal.

Therefore, without unnecessary calculations, the hierarchy model of the influence of the main factors on the public administration system of economic development, presented in *Fig. 2*.

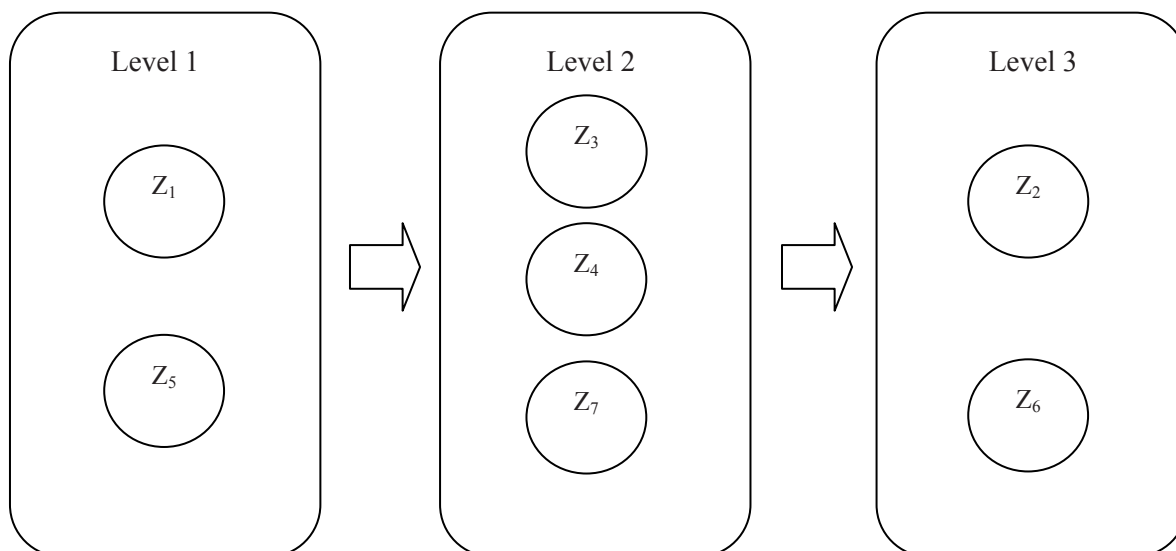


Fig. 2. **Model of the hierarchy of the influence of the main factors on the public administration system of economic development**

Thus, the biggest influence on the system of public management of economic development is exerted by the coronavirus and its consequences and military aggression on the part of the Russian Federation.

**Conclusions.** The public administration system is a complex and complex structure, which, with the right approach, can significantly affect the economic development of the region and the country as a whole. However, the effective operation of the public administration system is impossible if there is a negative influence of a number of factors and factors that prevent it. That is why, we have formed a methodological approach to the definition and compilation of the main factors of influence on the public administration system of economic development. As a result, we have formed an appropriate model of the hierarchical influence of certain factors using the method of peer review and graph theory. Our research can have a practical aspect of application in public authorities. The research has limitations, which can be traced in the fact that only the economic environment of Ukraine was used as an object of research and in subsequent research, attention should be focused on the international level.

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