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FISCAL CAPACITY OF THE CITY: THE ASSESSMENT OF THE INFLUENCE ON THE SUSTAINABILITY OF URBAN ENVIRONMENT AND THE QUALITY OF LIVING (THE CASE OF «SECOND» CITIES OF THE RUSSIAN FEDERATION)

The modern financial situation demonstrates tough asymmetry in financial development between the territorial units, which are the capital cities, and the «second» cities of constituent units of the Russian Federation. This is based upon chronic deficit of inner financial sources for covering the budget expenditure items of the latter ones. The instruments of municipal units' fiscal capacity level equalization, which are being implemented by the national government, lead to adverse effects. These effects of national fiscal practice include the resource dependence on the upper level and lack of interest of the «vice-capitals'» local authorities to broaden the inner income base, disbalance between economic, social, natural-resource components of urban environment's sustainable development and the fall of the residents' quality of living. In this connection, the effectiveness research of the current managerial mechanism of fiscal capacity of the «second» cities of constituent units of the Russian Federation in the context of the sustainable development concept is extremely important.

The results of the survey on the packaged approach to economical and statistical assessment of the fiscal capacity level as a defining factor of sustainable development of the urban environment and the residents' quality of living in «vice-capitals» of constituent units of the Russian Federation (the case of Magnitogorsk and Nizhniy Tagil) are presented in this article. Having used the packaged approach, the authors have brought to light the interconnection between the level of the «second» cities' fiscal capacity and indicator values of ecological and socio-economic well-being of the analysed area. Additionally, they have revealed the character and direction of this connection as well as assessed the competence of management of the financial opportunities generation and usage by means of determining the indicator values of the areas' fiscal capacity as of the current date and comparing them with optimum values.

Keywords: fiscal capacity, «second» cities, urban environment, quality of living, correlation dependence

Introduction

The In the current context, when the economic landscape has become multifarious, inconsistent, and less bright, the problem of fiscal capacity of «second» cities of constituent units of the Russian Federation in the context of the sustainable development concept comes to sharp focus. High efficiency of the financial solvency management of one cities together with the disequilibrium state of other local units creates a problem of the socio-economic and ecological unevenness. Further, it becomes the cause of the spate of macroeconomic cyclical variations and deterioration in quality of living.

The term «sustainable development» was brought in information environment and, afterwards, in common usage in 1987 by World Commission on Environment and Development, which defined it as «… the development which satisfies the needs of the present but does not pose a threat to the ability of the future generation to satisfy its needs» [1]. The paradigm of the sustainable development, as a rule, includes two groups of notions: the notion of needs, specifically, the needs which are essential for the existence of the poorest social groups. These needs must be the subject of the primary decision. The second group includes the notion of the technological and social organization constrains, which are imposed on the ability of the environment to present and future needs. Consequently, the growth in satisfiability of the needs of both present and future must be preserved, and resource exploitation, technological solutions, and the quality of management must be changed.

Sustainable development of the areas can be implemented in practice upon condition that a sound balance of economic, social, natural resources components is achieved. This balance guarantees not only increase and preservation of the real consumption level, but also availability and high quality of educational,

public health, etc. systems. The implementation of the specified primary objective of the «second» cities of constituent units of the Russian Federation sustainable development, which presumes the growth in socio-economic well-being and living standards, is only possible by means of inner financial sources activation. Evidently, the leading role in this process belongs to fiscal resources.

«Second» cities' fiscal capacity accomplishment, its socio-economic and ecologocal well-being, and, therefore, the adequate standard of living of its residents call in the development and application of the expansionary actions. These actions must be aimed at trying to enlarge the resource base, form and strengthen the financial potential. Undoubtedly, this problem is acknowledged and discussed on different levels of authorities. Nevertheless, we believe that without a packaged research on the impact of the financial sustainability as a factor of sustainable development of «second» cities of constituent units of the Russian Federation, which allows to compare the index of fiscal capacity and local area opportunities of getting best value out of its own economic territory, this problem cannot be solved in terms of quality. However, the existing mechanism of the financial performance assessment used in urban researches is based solely on quality analysis of the budgetary resources management, which does not reflect resource availability of the area and misrepresent the rating of its socio-economic dynamics [2].

Above-mentioned circumstances defined the urgency of the research and its practical implications. In this research, the analysis of the managerial efficiency of the most important factor of sustainable development of the urban environment and the residents' quality of living in the «vice-capitals» of constituent units of the Russian Federation – fiscal capacity – was done. The testing range was big industrial centers and «second» cities of Chelyabinsk and Sverdlovsk regions - Magnitogorsk and Nizhniy Tagil. These cities are matching in terms of population (as of the date 01.01.2017 Nizhniy Tagil – 356,3 K people, Magnitogorsk – 417,6 K people). Both cities arose from the big social changes – they are the settlements that were located around metallurgic plants [3].

It is needed to notice that «second» cities or «vice-capitals» are the areas which took the second place in the region in terms of population and are not included in the agglomeration of the central city of this region. «Second» cities have significant population, multifunctional structure, vast catchment areas, and developed tertiary sector [4, 5]. The last-mentioned factor is obvious as the size of the city defines its opportunities in the development of one or several lines of industry, self-sufficiency in service, and becoming a catchment area for less important and less populated territories.

Rich body of literature, which has become theoretical and methodological basis of the research, can be divided into two groups:

- the first group consists of the academic papers which reflect fundamental theoretic concepts of managing the formation and usage of the areas' financial potential;
- the second group includes the academic papers dedicated to economic and mathematical methods and tools using in the assessment of modern areas' resource availability.

During the analysis of the degree of scientific development of the problem it was detected that at this point there are almost no publications dedicated to the results of the practical approval of the economic and mathematical algorithms of the managerial efficiency packaged assessment of fiscal capacity as a factor of sustainable development of the urban environment and the residents' quality of living. Most of the papers are based on the analysis of certain criteria of the quality of management of area's fiscal capacity and leave the questions of the evaluation summary untouched. These papers include researches of Verbinenko E.A., Badylevich R.V. [6], Zenchenko S.V. [2], Kizeev A.V. [7], Liberati P. and Sacchi A. [8], Lundqvist H. [9], Warda J. [10], Wildavsky A. [11].

Thereafter, we highly appreciate the obtained results included in the abovementioned papers, although, there are not a few aspects that need deep analysis, clarification and development left.

Research Methods

The packaged method which has been used in economical and statistical assessment of the level of the budgetary resource availability as a defining factor of sustainable development of the urban environment and the residents' quality of living in vice-capitals of constituent units of the Russian Federation environment includes three stages.

During the first stage, with the help of statistical research interconnection between the level of fiscal capacity and the indicators, which characterize social and ecological well-being of «second» cities' environment, namely: mid-year population, real incomes of people, real personal consumption expenditures, real accrued wages, industrial output, setting to work of ground area of dwelling structures, retail turnover, level of performance, balanced financial result of companies' activity, and real fixed capital formation, complex index of water, air, and soil pollution, fix investments aimed at environment protection and rational use of natural resources, was disclosed and analyzed. It should be noted that it is the process of statistical research which helps to reveal cause-and-effect relations between phenomena – «the connection between phenomena and processes when the change of one of them – the cause – leads to the change of the other – the effect» [12].

To reveal the existence of the connection between the degree of «second» cities' of constituent units of the Russian Federation fiscal capacity and the indicators of the city's socio-economic and ecological well-being of the urban environment, its character, and the direction, we need to highlight factor and effective characteristics which are necessary for the research. As a factor characteristics for the aims of the analysis, the authors have chosen the level of fiscal capacity in Magnitogorsk and Nizhniy Tagil, which is described through the complex indicator as «financing structures are at the heart of asset-building processes; and these structures pose challenges for any development effort, whether in upper-income suburban or lower-income inner-core areas» [13]. As effective characteristics in this research the rates of increase of the sustainable development indicators and of the city environment over a period of 2008-2016 with an allowance for the conversion of value indicators on 2008 from factual into commeasurable ones.

Table 1.

Set of factor and effective indicators necessary for revealing the existence of the connection between the degree of fiscal capacity and the sustainable development indicators of «second» cities' of constituent units of the Russian Federation

Factor, X	Result, У	
Degree of fiscal capacity of the city, %	У1	Rate of population increase, %
	У2	Growth rate in real incomes of people, %
	У3	Growth rate in real personal consumption expenditures, %
	У4	Growth rate in real accrued wages, %
	У5	Growth rate in industrial output, %
	У6	Growth rate in setting to work of ground area of dwelling structures, %
	У7	Growth rate in retail turnover, %
	У8	Growth rate in level of performance, %
	У9	Growth rate in balanced financial result of companies' activity, %
	У10	Growth rate in real fixed capital formation, %
	У11	Growth rate in complex index of water, air, and soil pollution, %
	У12	Growth rate in fix investments aimed at environment protection and rational use of natural resources,%

Modern Statistics has developed a wide range of methods used for studying connections. To reveal the existence of the connection between the indicator of fiscal capacity and the efficiency of the implementation of government authorities' expenditure commitments in «second» cities, the method of correlation dependence analysis is used. Correlation connection exists in the places where interconnected phenomena

are characterized only by stochastic variables. In this connection, average value of stochastic variables of effective characteristic Y changes consistently depending on the value X. It proves that the interconnection between these phenomena has a correlation character and analytically it can be expressed as a function of $\bar{y}_x = f(x)$.

Strength of the relationship is expressed as a value of correlation coefficient, that is why strength of correlation relationship between the value indicator of fiscal capacity and the opportunity of the «second» city to get the utmost effect from its own economic territory might be measured by R-squared:

$$R^2 = \delta^2/\sigma^2, \quad (1)$$

where δ^2 is a standard error of estimate of aligned effective characteristic value;
σ^2 is a standard error of estimate of factual effective characteristic value.

For the qualitative evaluation of the strength of relationship based on the indicator value of the determination coefficient by convention the Chaddock scale correlation is used. It is represented in Table 2.

Table 2.

Chaddock scale correlation

R^2	0.1-0.3	0.3-0.5	0.5-0.7	0.7-0.9	0.9-0.99
Strength of relationship	Weak	Moderate	Noticeable	Strong	Quite Strong

During the second stage, the optimum value of «second» cities fiscal capacity, which determines maximum increase in the indicators characterizing sustainable development of the urban environment and the quality of life of the residents, is assumed to be calculated by means of arithmetic weighted mean. The formula is:

$$\bar{x} = \sum xf / \sum f, \quad (2)$$

where $\sum xf$ is the sum of production of the characteristics' value and their frequency ratio;
$\sum f$ is the total number of the units of the set.

The third stage of the packaged method includes the assessment of the formation and usage of the areas' financial potential by means of revealing the index values of the city's fiscal capacity as of the current date and comparing it with the optimum value.

Results

Within this article, an attempt of the assessment of the packaged method practical implementation in the research on the managerial effectiveness of fiscal capacity of «second» cities of Chelyabinsk and Sverdlovsk regions - Magnitogorsk and Nizhniy Tagil was made. These cities have a status of single-industry cities. On this subject Kharitonova N.A., Kharitonova E.N. and Levinson N.L. notice: «Economic restructuring within the Russian Federation has considerably reduced the number of industrial giants, many of which proved unviable in the new economic conditions. However, those that remain are leaders in Russian industry, and their success determines the life not only of the local municipalities but often also of the whole region where they are located; as before, they continue to determine the economic and industrial potential of the region» [14]. Naturally, we need to admit the fact that while attempting to assess such a complex system there is a risk of not covering full range of socio-economic factors which reflect the effectiveness of the city's financial policy.

The results of the first stage, which was supposed to reveal the connection between the degree of fiscal capacity of the city and the values of the indicators of sustainable development of the urban environment

and the quality of life of the residents with the help of determination coefficient, are represented in Table 3 and Figure 1.

As the determination coefficient shows a portion of variation of the effective indicators Y influenced by the factor indicator X, the calculated value analysis of the determination coefficient indicates the existence of very strong functional relationship between fiscal capacity and the indicators of sustainable development of the urban environment and the residents' quality of living in «second» cities' of constituent units of the Russian Federation. Specifically, the variation of 94,12 and 92,10% in growth rate in real incomes of people in Magnitogorsk and Nizhniy Tagil respectively is due to the change of the level of fiscal capacity and of 5,88 and 7,9 % is due to the other factors. Or the variation of 93,99 and 94,78% in growth rate in real fixed capital formation in the analysed cities is due to the change of the level of fiscal capacity and of 6,01 and 5,22 % is due to the other factors.

Said otherwise, the strength of relationship between the degree of fiscal capacity and the indicators of socio-economic and ecological well-being of the urban environment in «second» cities of constituent units of the Russian Federation is very strong.

Table 3.

The degree of strength of relationship between fiscal capacity and rate of growth in the indicators of sustainable development of urban environment of Magnitogorsk and Nizhniy Tagil

Factor, X	Result, У		Magnitogorsk		Nizhniy Tagil	
			Interconnection			
			R^2	Strength of relationship	R^2	Strength of relationship
Degree of fiscal capacity of the city, %	У1	Rate of population increase, %	0,6818	noticeable	0,7114	strong
	У2	Growth rate in real incomes of people, %	0,9412	very strong	0,9210	very strong
	У3	Growth rate in real personal consumption expenditures, %	0,9416	very strong	0,9255	very strong
	У4	Growth rate in real accrued wages, %	0,9254	very strong	0,9612	very strong
	У5	Growth rate in industrial output, %	0,7796	strong	0,7890	strong
	У6	Growth rate in setting to work of ground area of dwelling structures, %	0,9111	very strong	0,9244	very strong
	У7	Growth rate in retail turnover, %	0,7089	strong	0,7600	strong
	У8	Growth rate in level of performance, %	0,7859	strong	0,7860	strong
	У9	Growth rate in balanced financial result of companies' activity, %	0,7999	strong	0,8318	strong
	У10	Growth rate in real fixed capital formation, %	0,9399	very strong	0,9478	very strong
	У11	Growth rate in complex index of water, air, and soil pollution, %	0,9110	very strong	0,9211	very strong
	У12	Growth rate in fix investments aimed at environment protection and rational use of natural resources,%	0,9252	very strong	0,9475	very strong

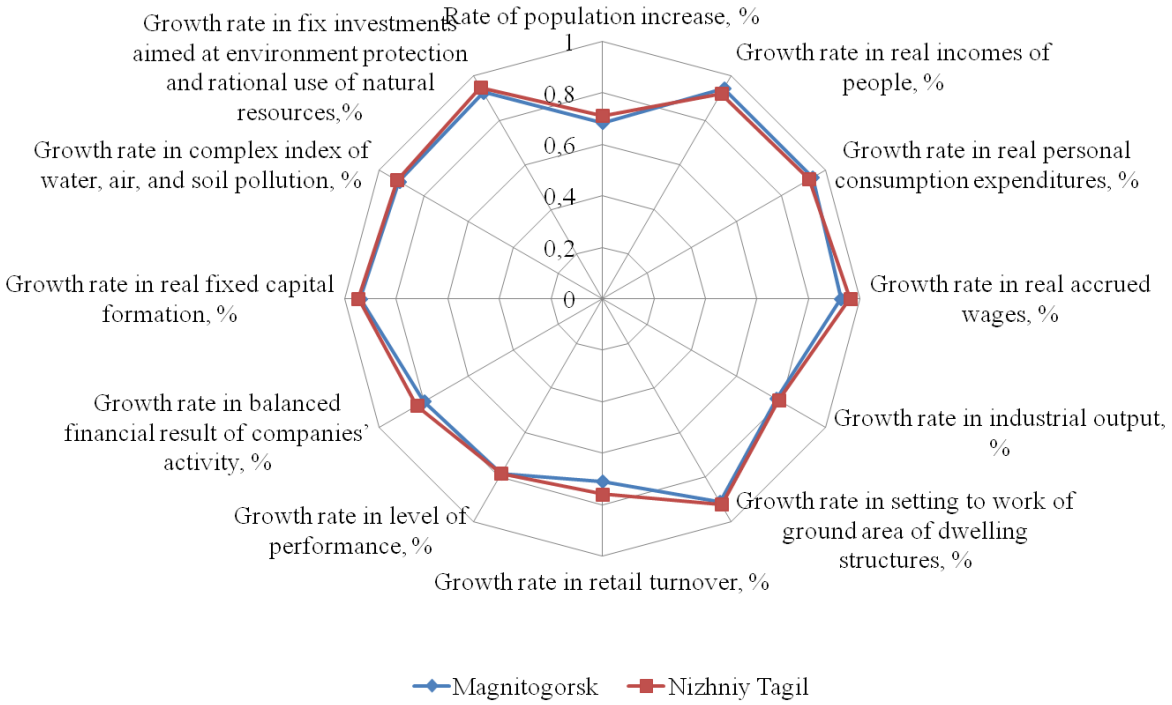

Fig. 1. *Strength of relationship between fiscal capacity and rate of growth in the indicators of sustainable development of urban environment of Magnitogorsk and Nizhniy Tagil based on determination coefficient*

The conclusive results of the second stage, which was supposed to reveal the level of fiscal capacity, which determines maximum increase in the indicators of socio-economic and ecological well-being of the urban environment, is assumed to be calculated by means of arithmetic weighted mean and basic data needed for the calculation, are presented in Table 4.

Table 4.

The results of the calculation of the optimum value of fiscal capacity in Magnitogorsk and Nizhniy Tagil

Magnitigorsk		Nizhniy Tagil	
Level of fiscal capacity, %	Sum of production of the characteristics' value and their frequency ratio	Level of fiscal capacity, %	Sum of production of the characteristics' value and their frequency ratio
76,11	45,67	68,90	48,23
66,59	19,98	56,25	11,25
54,44	5,44	54,46	5,45
$\bar{x} = 71{,}09\%$		$\bar{x} = 64{,}93\%$	

The results of the calculations confirm that the optimum value of fiscal capacity counted for Magnitogorsk and Nizhniy Tagil which stimulates the growth in the indicators of sustainable development must be at the average of 71,09 and 64,93 % respectively.

The identification of the optimum value which characterize fiscal capacity of «second» cities of constituent units of the Russian Federation by means of arithmetic weighted mean must be complemented with the calculation of mean deviation. The results of the calculations are presented in Table 5.

Table 5.

Calculation of mean deviation from the optimum value of fiscal capacity of Magnitogorsk and Nizhniy Tagil

Magnitogorsk		Nizhniy Tagil	
Level of fiscal capacity, %	Intermediate outcome of the calculation of mean deviation	Level of fiscal capacity, %	Intermediate outcome of the calculation of mean deviation
76,11	3,01	68,90	2,78
66,59	1,35	56,25	1,74
54,44	1,67	54,46	1,05
Outcome of the calculation of mean deviation	6,03	Outcome of the calculation of mean deviation	5,57

Practical implementation of the packaged method of the research on the managerial effectiveness of fiscal capacity of «second» cities of constituent units of Russian Federation shows that the optimum factor value which stimulates the growth in the indicators of sustainable development of urban environment and the residents' quality of living for Magnitogorsk varies between 65,06 and 77,12 %, for Nizhniy Tagil – between 59,36 and 70,5%.

The third stage allows to analyze the effectiveness of the managing the formation and usage of the areas' financial potential by means of revealing the index values of the city's fiscal capacity as of the current date and comparing it with the optimum value. As of 01.01.2017, the level of fiscal capacity for Magnitogorsk and Nizhniy Tagil was 35,88 and 37,35% respectively. These indices were in the prohibited zone, which can be characterized by slowdown of the socio-economic and ecological development of the territory (Fig.2). Moreover, above mentioned aspects of the research show that «… the revealed tendencies have a generally negative influence on the social and economic development of our country, which is supposed to be socially-oriented according to our constitution» [15].

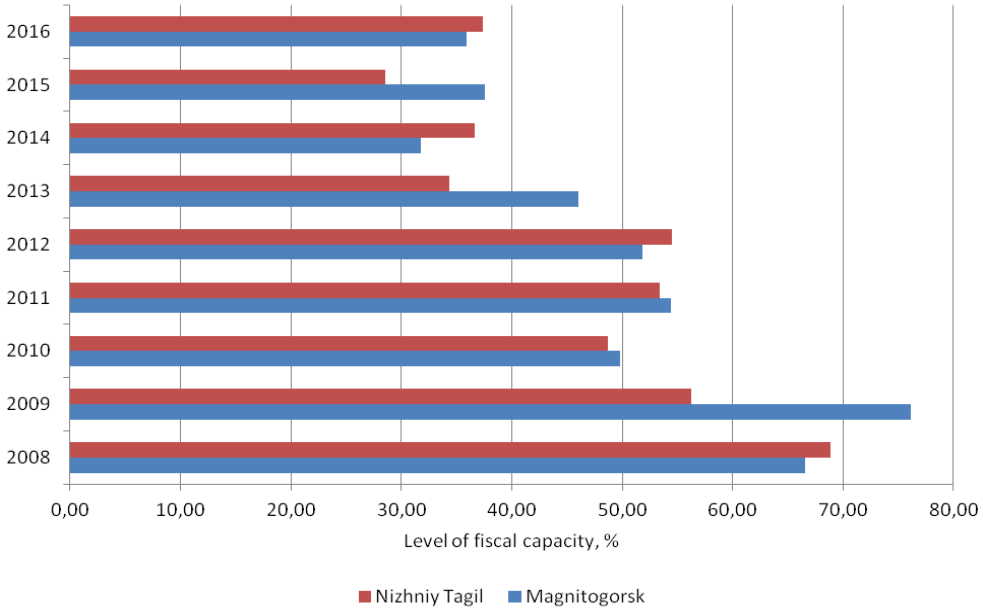

Fig. 2. Level of fiscal capacity of Magnitogorsk and Nizhniy Tagil dynamics in 2008-2016

Conclusion

As can be seen from the above, as a result of the research, the authors:

- tried out the packaged method for the assessment of competence of management of fiscal capacity of «second» cities of constituent units of the Russian Federation and it was stated that existing tools give an opportunity to conduct regular monitoring of the conformity of the factual effectiveness of financial policy indices to the optimum values; increase the interest of the local authorities in lowering the resource dependence on the upper level;

- identified discouraging character of the existing mechanisms of the financial potential generating in «second» cities of constituent units of the Russian Federation. These mechanisms not only retard the process of building-up positive indicators of the sustainable development of the urban environment and the residents' quality of living, but also exert downward pressure on entrepreneurship, putting business entities at the edge of survival.

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