

The application of statistical methods in the study of unprofitable organizations' activities

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Abstract. Unprofitable organizations rarely fall under the monitoring of the economic development of territorial entities. Rather, they are the object of study of forensic economic examination, appointed, for example, to establish the facts of false bankruptcy. Is the unprofitability identical to the failure of investment projects, and is it possible to put an equal sign between these categories and phenomena? Unprofitability of organizations is not always associated with criminal aspects or incompetent management. Often, the reasons can be so independent of managers that one just has to watch how a firm or business rolls down. These are economic reasons, for example, the appearance of powerful competitors-producers or substitute goods; this is also administrative reasons, caused by an imbalance in the relationship between business and government, the needs of officials and the “cashier” of entrepreneurs. In addition, a huge number of organizations, especially in mining and agrarian industries are planned loss-making: it relates to all industrially developed economies in the world. Thus, from the perspective of investment research, the question of their effectiveness and profitability is legitimate. The ratio of planned and unplanned unprofitability is a delicate matter, relative to the budget system. The problematic nature of these issues is manifested, both in theoretical and practical-management aspects. The adoption of any decisions on these issues is impossible without proper and adequate quantification of such a phenomenon in the economy, as the unprofitability of organizations. A comprehensive quantitative assessment is in the competence and theoretical and methodological field of statistical science. It is the application of statistical tools for the study of unprofitable organizations that this research is devoted to, as presented in the article

1 Introduction

The topic of unprofitability of organizations does not raise doubts in its actuality, as unprofitable organizations are inevitable, both for market and planned economy.

Unprofitability of organizations, as an economic phenomenon, can be viewed as an indicator of the state, results and development of business, and at the same time it is an

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incentive to improve this business and the economy. Every year during the last decade, almost all large and medium-sized organizations finish their fiscal year with a loss and do not pay a profit tax, which, in turn, is one of the main income-generating items in the budget. This can be regarded as an actual economic issue.

The unprofitability of an enterprise should be considered as a financial condition of an organization when its cash receipts are inadequate to the needs for both current and capital expenditure related to the implementation of economic activity: profit is equal to zero or close to that, and financial obligations, including unsecured ones, grow.

The object of this study is to define the activities of unprofitable organizations in the context of the municipal districts of the Vladimir region; the subject of the research will be a quantitative assessment of the activities of unprofitable organizations on the basis of the application of statistical methods and indicators characterizing the results and factors determining the state of the designated object.

The purpose of the study is defined as a complex statistical analysis of loss-making organizations. At the same time, the main task is to test statistical methods, which should form the basis of the methodology of this statistical analysis that is of complex nature. In the process of research, statistical information from the official Rosstat (The Federal State Statistics Service) website, and information presented in official statistical publications, as well as specialized scientific publications (monographs), periodic mass media materials, Internet resources were used.

2 Systematization of statistical information

2.1 Statement of the problem of applying the method of analytic groupings

In order to get an idea of the socio-economic development of the regions, it is necessary to establish the interrelations and interdependencies between the most significant socio-economic indicators of these regions, as well as to determine the impact of some indicators of socio-economic development on others, and subsequently reveal the patterns of this change. In order to reveal the dependence of some socio-economic indicators on others, it is necessary to apply the method of analytical groupings and the correlation and regression method.

In statistics, the method of groupings is a continuation of the statistical summary: after all the information on all units of observation has been brought together and checked to meet the requirement of statistical homogeneity, it is necessary to break up the whole array of units - in this case, these are districts of the constituent entity of the Federation - into homogeneous groups or socio-economic types. In multidimensional grouping, they are called clusters. In our study, the grouping is carried out in order to obtain the most general idea of the structure of activities of unprofitable organizations, to identify and, if possible, to establish interrelations and interdependencies between the resulting and explanatory (grouping) indicators.

Applying the method of groupings, we will reveal the dependence of the financial result of unprofitable organizations on the number of unprofitable organizations. That is, we will check how the extensive factor affects the result.

The main objective of this stage of the study is to identify the existence of a relationship between the number of unprofitable organizations, the financial result of loss-making organizations, accounts receivable and accounts payable, as well as arrears in payments to the budget from the total amount of accounts payable, and debts to suppliers and contractors for goods, works and services from the total amount of accounts payable.

Let us designate the scientific hypothesis as the assumption that the more loss-making organizations will be within the territories of the municipal districts of the Vladimir region, the higher is the financial result of unprofitable organizations. The logic is that loss-making organizations should not be viewed as failure investments: they can continue and de facto continue carrying out their activities, create value and contribute to the creation of a gross regional and domestic product.

We will carry out a statistical analysis of the relationship between individual socio-economic indicators for the sixteen municipal districts of the Vladimir region on the basis of the actual data for 2016.

2.2 Implementation of practical calculations for the formation of socio-economic types

To assess the cause-effect relationships in relation to the set purpose and the generated array of input data, it is necessary to determine what indicators will be resulting, explanatory, and grouping. As a rule, the grouping indicator, that is, the one that will form the basis of the grouping is selected from among the explanatory indicators.

As a resulting indicator "Y", the financial result of loss-making organizations was adopted. As explanatory indicators, the following ones are selected:

X1 - Accounts receivable of organizations;

X2 - Accounts payable of organizations;

X3 - Arrears in payments to the budget from the total amount of accounts payable;

X4 - Indebtedness to suppliers and contractors for goods, works and services from the total amount of accounts payable;

X5 - The number of unprofitable organizations

Table 1 Economic indicators of the municipal districts of the Vladimir region in 2016, thousand rubles.

No	Municipal districts	Accounts receivables	Accounts payable	Arrears in payments to the budget from the total amount of accounts payable	Debts to suppliers and contractors for goods, works and services from the total amount of accounts payable	Number of unprofitable organizations, units	The financial result of unprofitable organizations
1	Aleksandrovskii	3614273	6572872	289097	5317180	14	396849
2	Viaznikovskii	747196	1411486	131619	931858	8	222048
3	Gorokhovetskii	1255606	655332	25494	447174	3	33313
4	Gus-Khrustalnyi	1454678	1852585	185922	1070856	4	464141
5	Kameshkovskii	1541514	893671	34691	524116	2	15103
6	Kirzhachskii	4498063	2938709	187322	2322170	4	180549

7	Kovrovskii	397603	218009	36943	130124	3	39677
8	Kolchuginskii	3948050	12359691	3322252	6251434	11	7244888
9	Melenkovskii	543515	390324	57294	236943	1	8987
10	Muromskii	120197	62678	765	25334	4	7879
11	Petushinskii	15125896	19812327	1146513	17747102	13	607190
12	Selivanovskii	176249	58409	17784	30422	2	1669
13	Sobinskii	10337751	6805237	1157839	4509675	7	31164
14	Sudogodskii	309004	226318	28356	153787	2	1604
15	Suzdalskii	588116	655765	37734	459589	7	95701
16	Yuriev-Polskii	1569772	1383626	55496	1025165	5	25342

As a grouping indicator, we take X5. The effect of this indicator on the result can be considered the most hidden, and therefore, of interest for statistical analysis of relationships. Visually, there is a positive relationship between the quantity and financial result of the activities of unprofitable organizations.

Let us build the grouping according to X5. To do this, one needs to split the data array into groups. To do so, we find the number of groups.

$R = X_{max} - X_{min}$, where:

R is the variation range; X_{max} is the maximum value of X1; X_{min} is the minimum value of the variable X5.

Variation range: $R = 14 - 1 = 13$ units.

The number of groups is determined by the Sturges rule: $N = 1 + Lg(n) * 3,322$.

Hence, N = 5 groups.

The width of the interval is determined by the formula $h = R / N = 3$ units.

Table 2 Distribution of districts of the Vladimir region by groups.

Group number	Number of unprofitable organizations	District number
1	Up to 4	3, 4, 5, 6, 7, 9, 10, 12, 14
2	4 to 7	13, 15, 16
3	From 7 and more	1, 2, 8, 11

The distribution of municipal districts by the grouping indicator - the number of unprofitable organizations - is visualized on the Figure 1.

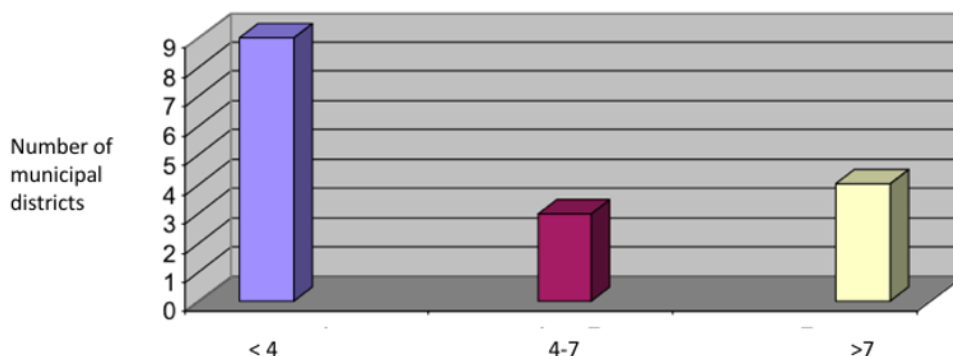


Fig. 1. Distribution of municipal districts of the Vladimir region by the number of unprofitable organizations in 2016.

Submission of such scattering of points to the normal distribution law is highly doubtful, since the most characteristic districts are those, on the territory of which the number of unprofitable organizations is less than four. The distribution of financial results and liabilities by the formed groups, constructed by the indicator of the number of unprofitable organizations is of special interest for the analysis of the structure of the phenomenon being studied.

Based on the resulting distribution, we can calculate the average values of all indicators for each of the groups. To do this, let us construct a calculation table.

Table 3. Calculation of the average values of indicators by the groups of municipal districts of the Vladimir region in 2016, thousand rubles.

n	Municipal districts	Number of unprofitable organizations, units	Accounts receivables	Accounts payable	Arrears in payments to the budget from the total amount of accounts payable	Debts to suppliers and contractors for goods, works and services from the total amount of accounts payable	The financial result of unprofitable organizations
9	Melenkovskii	Up to 4	543.515	390.324	57.294	236.943	8.987
5	Kameshkovskii		1541.514	893.671	34.691	524.116	15.103
12	Selivanovskii		176.249	58.409	17.784	30.422	1.669
14	Sudogodskii		309.004	226.318	28.356	153.787	1.604
3	Gorokhovetskii		1255.606	655.332	25.494	447.174	33.313
7	Kovrovskii		397.603	218.009	36.943	130.124	39.677
4	Gus-Khrustalnyi		1454.678	1852.585	185.922	1070.856	464.141
6	Kirzhachskii		4498.063	2938.709	187.322	2322.17	180.549
10	Muromskii		120.197	62.678	0.765	25.334	7.879
	Amount			10296.43	7296.035	574.571	4940.926
	Average for 1 group		1144.047	810.67056	63.841222	548.9917778	83.658
16	Yuriev-Posadskii	4-6	1569.77	1383.626	55.496	1025.165	25.342
13	Sobinskii		10337.75	6805.237	1157.839	4509.675	31.164
15	Suzdalskii		588.116	655.765	37.734	459.589	95701
	Amount		12495.64	8844.628	1251.069	5994.429	152.207
	Average for 2 group		4165.213	2948.2093	417.023	1998.143	50.73567
2	Viaznikovskii	7 and more	747.196	1411.486	131.619	931.858	222.048
8	Kolchiginskii		3948.05	12359.691	3322.252	6251.434	7244.888
11	Petushinskii		15125.89	19812.327	1146.513	17747.102	607.19
1	Aleksandrovskii		3614.273	6572.872	289.097	5317.18	396.849
	Amount		23435.42	40156.376	4889.481	30247.574	8470.975
	Average for 3 group		5858.853	10039.094	1222.37025	7561.8935	2117.744
	Total by the region		46227.48	56297.039	6715.121	41182.929	9376.104
	Average by the region		2889.218	3518.564	419.69506	2573.933	586.007

The final values of the indicators for all three groups are to be paid attention. If the first group, which includes the majority of municipal districts - 9 of 16 - concentrates the financial result of unprofitable organizations in the amount of 752.9 thousand rubles (or only 8.03% of the total financial result of the region as a whole), then the four regions composing the third group accumulate the amount by the resulting indicator in the value exceeding 8470 thousand rubles. The share of the third group exceeds 90% in terms of financial performance of loss-making organizations (the second group - 1.62%). The situation is similar for the rest of the indicators, indicated as explanatory. This only indicates planned loss-making, or non-competitiveness of the analyzed organizations in most districts of the Vladimir region. At the same time, speaking about these organizations in this very majority, it should be noted that the scale of their activities, judging from the data in the Table 3, is insignificant. Each of the four districts of the third group - Viaznikovskii, Kolchuginskii, Petushinskii and Aleksandrovskii - has more than 7 loss-making organizations on its territory, and as noted above, the financial result of their activities has the largest share, which indicates the actual effectiveness of programs, measures and individual actions to support organizations, and, consequently, the employed population.

After the districts of the constituent entity of the Federation are distributed according to homogeneous groups and the average group values of indicators are calculated, it is possible to build an analytical grouping.

Based on the results of the grouping, we can state that the more is the number of unprofitable organizations, the more is the financial result of their activities, the receivables and payables. This only shows that organizations continue to conduct real economic activities, working not only through budgetary subsidies, but also on the accumulated potential, formed trade and financial contacts and schemes, as evidenced by the positive direction of the relationship between debt indicators and the financial result. There is also an increase from the group to the group of the indebtedness indicator for payments to the budget (out of the total amount of accounts payable), which cannot be unequivocally regarded as a negative phenomenon, as the growth of this type of debt, indicates the availability of a tax base - the value created by these organizations, that is a part of the regional product.

Table 4. Grouping of municipal districts of the Vladimir region by the number of unprofitable organizations in 2016.

No	Groupings	Number of municipal districts	Accounts receivables, thousand rubles	Accounts payable, thousand rubles	Arrears in payments to the budget from the total amount of accounts payable, thousand rubles	Debts to suppliers and contractors for goods, works and services from the total amount of accounts payable, thousand rubles	The financial result of unprofitable organizations, thousand rubles
1	Up to 4	9	1144.04	810.67	63.84	548.99	83.66

2	4 to 7	3	4165.21	2948.21	417.02	1998.14	50.74
3	7 and more	4	5858.85	10039.10	1222.37	7561.89	2117.74
Average by the region			2889.22	3518.564	419.69	2573.93	586.01

2.3 Primary assessment of the correlation ratio between indicators

In order to quantify the correlation between the grouped (number) and resultant (financial result) indicators, it is required to calculate the empirical determination coefficient and the empirical correlation ratio:

$$\eta^2 = \frac{\delta^2}{\sigma^2} - \text{empirical determination coefficient}$$

$$\eta = \sqrt{\eta^2} - \text{empirical correlation ratio}$$

To do this, it is necessary to measure the variation of the indicator of the financial result of the activities of unprofitable organizations - the total dispersion, and the inter-group dispersion, which is a part of the overall variance that shows how much of the dispersion the variation of the grouping indicator, that is the number of unprofitable organizations, takes for itself (or explain). The total variance (σ^2) is equal to 9437811,553 thousand rubles.

Intergroup dispersion is calculated by the formula of the weighted mean square, because the groups are numerically unequal:

$$\delta^2 = 115689313.9 / 16 = 7230582.12 \text{ thousand rubles}^2.$$

To quantify the relationship between the grouping indicator and the resultant indicator, an empirical determination coefficient is calculated that shows how much of the variance of the resultant attribute is due to the influence of the independent variable that is the basis of the grouping.

Then the empirical determination coefficient will amount to: $\eta^2 = 7230582.12 / 9437811.553 * 100\% = 76.61\%$.

Then the empirical correlation ratio: $\eta = 0.875$.

Variance of the financial result indicator by unprofitable organizations by more than 76.61% is explained by the grouping indicator – by their number. The correlation relation takes on a value in the interval (0; 1). In this case, a value equal to 1 gives us a functional relationship, and a value equal to 0 is interpreted as the absence of any relationship. The Chaddock scale, which reflects the quantitative measure of the significance of the relationship inseparably from the qualitative characteristics of the relationship being studied, makes it possible to characterize the value of 0.875 as a high degree of the correlation relationship between the quantity and the financial result of the unprofitable organizations in the Vladimir region in 2016.

Analysis of the financial results of unprofitable organizations is immeasurably more important than that of the well-off, working steadily and profitably, since it is an indispensable and integral part of the anti-crisis program. The solution of these tasks is developed by the units of the management system in order to stabilize the work of the organization and to overcome loss-making.

The hypothesis stating that with the increase in the number of unprofitable organizations in the municipal district of the Vladimir region, the financial result of unprofitable organizations will also increase was confirmed by the statistical calculations. Thus, unprofitable organizations, despite the associative, or even intuitive, view of them, are not missing capital or failure investments.

From this statement, it follows that the relationship between such indicators as the financial result of unprofitable organizations, the number of unprofitable organizations; accounts receivable; accounts payable; debts on payments to the budget from the total amount of accounts payable; debt to suppliers and contractors for goods, works and services out of the total amount of accounts payable is quite high, which gives us grounds for more accurate studying the interrelated impact of different indicators of the performance of unprofitable organizations and socio-economic development. It is necessary to introduce in the initial data direct resource indicators, best of all labor and investment ones.

3 Modeling the interrelations of the performance indicators of unprofitable organizations on the basis of the correlation and regression method

3.1 Obtaining quantitative estimates and parameters of the influence of factors on the financial result of unprofitable organizations

Dependence of the financial result of unprofitable organizations on the state of financial calculations, the level of investment in fixed assets and other economic indicators can be identified and quantified using the method of correlation and regression. It is the correlation-regression analysis in statistics that is the main method and means of generalizing and analyzing statistical information about socio-economic processes in the life of society.

The correlation and regression method must be applied in order to simulate the interrelation of the performance indicators of unprofitable organizations and indicators of socio-economic development. Applying the method of correlation-regression analysis, it is necessary to reveal interrelations and interdependencies between socio-economic indicators by the municipal districts of the Vladimir region. This method is the main one in statistics for studying the relationship of phenomena.

The task is the following: applying the method of correlation-regression analysis, it is necessary to identify and quantify the dependence of the resultant indicator “Y” - the financial result of loss-making organizations - on the factor (explanatory) indicators:

- X1 - Accounts receivable;
- X2 - Investments in fixed assets from the municipal budget;
- X3 - Accounts payable;
- X4 - Average number of employees of organizations;
- X5 – Shipped goods of own production

Based on the official data of the Federal State Statistics Service (<http://www.gks.ru>), let us generate the following initial data.

Table 5. The financial result of loss-making organizations and the factors determining it in the municipal districts of the Vladimir region in 2016, thousand rubles.

No	Municipal districts	Accounts receivable ь	Investments in fixed assets from the municipal budget	Accounts payable	Average number of employees of organizations, people.	Shipped goods of own production, performed works and services on its own (without small businesses)	Financial result of loss-making organizations
1	Aleksandrovskii	3614273	1128856	6572872	14455	18940275	396849
2	Viaznikovskii	747196	381685	1411486	12388	8395416	222048
3	Gorokhovskii	1255606	846073	655332	3388	5083327	33313
4	Gus-Khrustalnyi	1454678	181773	1852585	5025	6162682	464141
5	Kameshkovskii	1541514	258164	893671	4627	7402870	15103
6	Kirzhachskii	4498063	1807114	2938709	7476	15231647	180549
7	Kovrovskii	397603	169128	218009	4368	2120392	39677
8	Kolchuginskii	3948050	429433	12359691	9617	20068980	7244888
9	Melenkovskii	543515	356681	390324	5029	2882763	8987
10	Muromskii	120197	85617	62678	772	357121	7879
11	Petushinskii	15125896	8677003	19812327	11202	43577124	607190
12	Selivanovskii	176249	132375	58409	2563	1734900	1669
13	Sobinskii	10337751	3129594	6805237	10540	54783457	31164
14	Sudogodskii	309004	382388	226318	5802	3700766	1604
15	Suzdalskii	588116	630091	655765	6556	3838602	95701
16	Yuriev-Posadskii	1569772	979064	1383626	6455	8096870	25342

The application package analysis of Exel allowed obtaining the following matrix of the paired correlation coefficients.

Table 6. Matrix of the paired correlation coefficients.

	Column 1	Column 2	Column 3	Column 4	Column 5	Column 6
Column 1	1					
Column 2	0.936881	1				
Column 3	0.876827	0.827751	1			

Column 4	0.558347	0.449014	0.614564	1		
Column 5	0.933342	0.768621	0.771034	0.639019	1	
Column 6 (Y)	0.127902	-0.03357	0.496774	0.251875	0.17017	1

Based on the results of the conducted correlation analysis, it can be concluded that there is a strong positive relationship between the financial result of unprofitable organizations and accounts receivable, and the average number of employees of organizations. On this matrix, we also establish a moderate positive relationship between the financial result of unprofitable organizations and accounts payable, as well as the presence of a weak positive relationship between the financial result of unprofitable organizations and the number of shipped goods of own production. At the same time, the only negative value observed in the matrix is in relationship between the financial result and investments in fixed assets from the municipal budget, which can be considered as a definite signal in favor of the fact that investment flows carried out at the expense of municipal budgets need inventory. So informative is the sixth line, indicating a paired correlation of the financial result of unprofitable organizations and investments in fixed assets at the expense of municipal budgets, and also pairwise with other explanatory indicators. Correlation coefficients placed in the central part of the matrix characterize a pairwise relationship between the explanatory indices themselves. One of them indicates a high degree of relationship between the level of investment in fixed assets and the accounts payable of organizations, which can partly adversely affect the regression model to be built (the phenomenon of multicollinearity).

In order to determine the analytical expression of the relationship between the resulting and the explaining indicators, it is necessary to conduct a regression analysis - to construct an adequate model of dependence: to choose the most qualitative model from several possible options, that in the best way describes the process of forming the financial result of unprofitable organizations under the influence of factors included in this model.

Let us construct a regression model that describes the process of formation of the financial result of unprofitable organizations: the regression equation of the resultant indicator “Y” as a function of five explanatory indicators: X1, X2, X3, X4, X5:

$$\hat{Y}(X1,X2,X3,X4,X5) = b_0 + b_1*x_1 + b_2*x_2 + b_3*x_3 + b_4*x_4 + b_5*x_5$$

Table 7. Regression statistics with all explanatory indicators taken into account.

<i>Regression statistics</i>			<i>coefficients</i>	<i>t-statistics</i>
Multiple R	0.953401184	Y-intersection	759638.2031	1.985094902
R-square	0.908973818	The Variable X 1	-0.262324276	-1.877371657
Normalized R-square	0.863460728	The Variable X 2	-1.007975906	-2.006482517
Standard Error	659840.7671	The Variable X 3	0.623573738	6.993444848
Observations	16	The Variable X 4	-131.6393021	-1.783680523
		The Variable X 5	0.041947615	2.531888116

Based on the regression statistics obtained, it can be stated that the coefficient of determination (R-square) is 0.9089, that is, the indicators included in the model explain the variation of the financial result of unprofitable organizations in the space of units - municipal districts of the Vladimir region in 2016 explain on 90.9 %.

Based on the results of the regression analysis (construction of all possible equations), it can be concluded (the mathematical aspect of choice) that the most appropriate is the first model, which includes all the explanatory indicators. This model is the most adequate, since the coefficient of determination of this model has the greatest value.

$$\hat{Y}(X1,X2,X3,X4,X5) = 759638.2031 - 0.262324276*x1 - 1.007975906*x2 + 0.623573738*x3 - 131.6393021*x4 + 0.041947615*x5$$

Let us calculate the elasticity coefficients based on this model. To do this, we will use both the regression parameters and the average values of the resultant and explanatory indicators:

$$E1=b1*\frac{\bar{x1}}{\bar{y}} = -0.262324276*2889217.688/586006.5 = -1,3\%$$

$$E2=b2*\frac{\bar{x2}}{\bar{y}} = -1.007975906*1223439.938/586006.5 = -2,104\%$$

$$E3=b3*\frac{\bar{x3}}{\bar{y}} = 0.623573738*3518564.938/586006.5 = 3.74\%$$

$$E4=b4*\frac{\bar{x4}}{\bar{y}} = -131.6393021*6891.4375/586006.5 = -1.55\%$$

$$E5=b5*\frac{\bar{x5}}{\bar{y}} = 0.041947615*12648574.81/586006.5 = 0.905\%$$

All the necessary calculations have been made, which make it possible to proceed to the stage of interpreting the results of the statistical study.

3.2 Interpretation of economic and mathematical results of the statistical study

The constructed regression model for indicators characterizing the economy of the municipal districts of the Vladimir region in 2016 allows us establishing the following patterns.

With an increase in accounts receivable by 1 thousand rubles, a decrease in the financial result of unprofitable organizations by 0.26 thousand rubles is observed, probably for the reason that accounts receivable represent a debt to the organization, primarily for shipped products. In this case, it can be assumed that the stated situation is a symptom, albeit not a crisis, but a certain build-up of debts between organizations, connected primarily with the sale of products. Since debts to organizations increase (lack of payment for shipped products), they are deprived of the opportunity to fulfill their own financial obligations. Consequently, there are all kinds of penalties, fines and fees leading inevitably to the fact that the financial result is a loss due to debt repayment. In turn, problems with sales are everywhere now in the regions of central Russia due to a decline, first of all, the payment demands of the population on the consumer and other markets. That is, with an increase in accounts receivable by 1%, the financial result of unprofitable organizations decreases by 1.3%.

The growth of investments in fixed assets at the expense of the municipal budget by 1 thousand rubles is accompanied by a decrease in the financial result of unprofitable organizations by 1.007 thousand rubles. This clearly indicates that for municipal budgets unprofitable organizations are a “normative” burden, an anchor that the state simply has to drag out. These investments are not effective, and therefore they are accompanied by a decrease in the overall financial result of unprofitable organizations. With an increase in

accounts receivable by 1%, there is a decrease in the financial result of unprofitable organizations by 2.1%.

The increase in accounts payable by 1 thousand rubles puts a positive sign for the financial result of unprofitable organizations by 0.62 thousand rubles, as it provides an opportunity to find additional sources of financing current costs, including those related to the marketing of products, and thereby partially stabilize economic activity. With an increase in accounts receivable by 1%, the financial result of unprofitable organizations increases by 3.74%.

With an increase in the average number of employees of organizations by one person, the financial result of unprofitable organizations is reduced by 131.6 thousand rubles, since an increase in the number of employees does not guarantee an improvement in the work process. In this situation, it can be assumed that the labor force is not appropriately divided, and hence the financial result decreases. At the same time, remuneration of labor is an element of cost price that reduces the financial result directly. In the cost-effective management, wage is considered a material incentive, but it is not the case. With an increase in accounts receivable by 1%, the financial result of unprofitable organizations decreases by 1.55%.

The indicator of the volume of shipped goods of own production, increasing by 1 thousand rubles, leads to an increase in the financial result of unprofitable organizations by 0.04 thousand rubles. This is a natural truth. That is, with an increase in the shipment of products by 1%, the financial result of unprofitable organizations grows by 0.905%.

It is expedient to continue the static analysis by analyzing the dynamics of the phenomenon under study. For this purpose, statistics have developed methods of analytical equalization and forecasting, index method, methods of relative values, etc.

4 Conclusions

The study of unprofitable organizations of the municipal districts of the Vladimir region presented in the scientific article is aimed at examining the analytical capabilities of statistical tools, represented by such methods as analytical groupings, correlation and regression, for a comprehensive assessment of factors determining the patterns of the financial result of these organizations. Undoubtedly, this research is an integral part of the overall monitoring of the economic development of territorial entities, which cannot be isolated from the statistical analysis of investment processes, development of market infrastructure, living standards, foreign economic relations, labor resources, migration, unemployment, social conditions and other important aspects social evolution.

In general, the testing of these methods that led to practical results based on fresh factual data can be considered rather successful. It should be noted that the application of the methods considered in the conduct of a comprehensive statistical analysis of loss-making organizations is not exhaustive. Static and dynamic analysis can be performed on the basis of a variety of statistical methods, the application of which should be considered as a promising research direction.

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