

# The relationship of city and small business economic parameters

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**Abstract** — The article presents the results of a study on dependencies between the macroeconomic parameters of Yurga City and those of financial-economic activity in small businesses.

**Keywords** — aggregated economic parameters; small enterprises; correlation; municipalities; micro-parameters.

## I. INTRODUCTION

Small business enterprises are newly created or operating enterprises with a certain quantitative criterion of the number of employees and the volume of economic turnover [1,2,3]. They include businesses with a maximum number of industry and construction employees up to 200 people, those of science and scientific services – up to 100, of other manufacturing sector branches – up to 25, of retail trade – up to 15 (the decree "On measures to create and develop Small Enterprises" of August 8, 1990).

Previous studies [1] have shown that new activities for small businesses can appear throughout the life of the enterprise. From the very beginning of its existence, any enterprise makes effort to develop and become more stable in an aggressive business environment. One of the tools to stabilize and achieve sustainable growth is activity diversification, i.e. the creation and opening of new business lines. The main reasons for the small business enterprise to create new business lines are as follows [1,3,4,5,6]:

1. The specifics and nature of running a small business are built on the constant search for effective means to generate profit and achieve set goals.
2. A successful primary small business venture provides financial and other type resources that enable organization of new business lines within the existing small business enterprise.
3. In the process of following the primary business line, additional measures may be required to support

and develop it. These measures may in time "turn" into a new business line or lines.

4. High (tax, accounting, political, competitive, etc.) risks force small business owners to diversify their activities by opening new lines of business.

5. Optimization of tax accounting in terms of the legislation is an existing opportunity to reduce tax burden on the small enterprise with the use of various accounting mechanisms in different business lines, for example, by joint use of special taxation regimes: simplified taxation system (STS) and unified tax on imputed income (UTII).

6. New directions of activity may cause the synergy effect – an additional leap in the development of both existing small enterprise business lines, and the small business enterprise itself [4,5,6].

Thus, the emergence of new lines in the economic activity for small enterprises is a natural process in their functioning [1,3-8].

The subject of this paper is the study of the dependencies between the dynamics of macroeconomic parameters of the city of Yurga and the parameters of financial and economic activity of small enterprises.

## II. YURGA ECONOMIC PARAMETERS DATA ORIGINATION

Two main sources on the 2007-2015 period were taken as a resource for the economic parameter data of the mono-city of Yurga: annual reports of the Yurga mayor on the social and economic city development from the official city website [9] and the website part of the Russian Federal State Statistics Service (FSSS) [10] that contains parameters characterizing the state of the economy and social sphere of this municipal formation.

The above sources contain a large amount of data. Thus, the FSSS database contains about 2.5 thousand

economic and social parameters for the city of Yurga; whereas reports the Yurga mayor contain 11 main sections with more than 300 different parameters. Therefore, to conduct research it was necessary to take only those parameters that have the greatest direct impact on the development of small businesses in the mono-city and / or reflect the city economic and social development at most.

Following the analysis, only the succeeding parameters were left to study the relations with small businesses (Table. 1).

TABLE I. THE MAIN ECONOMIC PARAMETERS OF YURGA IN 2007-2015

Parameter	31.12.2007 31.12.2008 31.12.2009	31.12.2010 31.12.2011 31.12.2012	31.12.2013 31.12.2014 31.12.2015
1. UTH for certain types of activities, thousand rubles	31718.00 31522.00 33979.40	40624.10 45716.00 50980.80	49546.90 55145.70 52156.50
2. Number of self-employed entrepreneurs	2100.00 2000.00 2602.00	2268.00 2183.00 2183.00	1750.00 1723.00 1670.00
3. Number of small businesses	400 393 364	483 483 633	697 702 750
4. Personal income tax, thousand rubles	226628.00 271449.00 265780.40	273005.10 332451.30 414938.50	402920.90 353865.60 362935.60
5. Taxes on total income, thousand rubles	31724.00 31525.00 33988.10	40655.10 45886.70 51227.20	49899.80 55552.70 53156.50
6. Average monthly nominal income per capita, rubles	9445.00 12547.00 11722.40	13638.00 14904.60 15978.20	16720.30 19422.00 20539.20
7. Population, people.	83836.00 83883.00 83860.00	81454.00 81180.00 81385.00	81446.00 81139.00 81396.00
8. The number of large and medium-sized enterprises	25 25 23	21 21 20	20 20 16

### III. ORIGATION AND COLLECTION OF DATA ON ECONOMIC PARAMETERS OF SMALL ENTERPRISES IN YURGA

An official list of subjects of Yurga mono-city small and medium-sized businesses was found. The Federal website of the unified state register for small and medium-sized businesses allows collecting such data. Only legal entities were selected from the register of small and medium-sized business subjects.

Table. 2 presents data on the number of small enterprises in corresponding periods whose financial parameters were collected for analysis.

The initial data sets for the analysis of economic parameters were the balance sheet and profit and loss accounting forms.

To make the obtained data less dependent on the number of small enterprises for each sample year, it was decided to take the "Revenue" parameter as the basic one.

The weight of each of the small business enterprise was found in the total revenue for each year and the obtained weight value was multiplied by the value of the parameters under study for each enterprise. After that, the obtained values for each of the parameters were added to the final values by years.

TABLE II. THE NUMBER OF SMALL ENTERPRISES UNDER STUDY BY YEARS

Period number	Year	Number of small enterprises with parameters taken for study sample
1	2007	41
2	2008	43
3	2009	41
4	2010	54
5	2011	58
6	2012	104
7	2013	252
8	2014	291
9	2015	320

In addition, since the number of enterprises studied was different for different years, it became necessary to bring data for different years to a relative form. It was thus decided to determine the relationship of all total aggregate balance-of-payments parameters to the corresponding value of the "Balance" parameter. Thus, the analyzed aggregate parameters were transformed into the following:

1. Revenue was determined as the average value – the ratio of the total annual revenue value to the number of small businesses under study for the corresponding year.
2. The ratio of the "Total for Section I (Non-current Assets)" parameter to the "Balance" parameter: NCAB.
3. The ratio of "Total for Section II (Current assets)" to the "Balance": CAB.
4. The ratio of "Total for Section III (Capital and Reserves)" to the "Balance": CRB.
5. The ratio of the "Total for Section IV (Long-term liabilities)" to the "Balance": LTLB.
6. Ratio of "Total for section V (Short-term liabilities)" to the "Balance": STLb.
7. The ratio of the "Aggregate financial result of the period" to the "Revenues": ARR.

Table. 3 shows the values of parameters for the period of research, but already with the weight coefficients to the basic parameter.

TABLE III. AGGREGATED VALUES OF PARAMETERS WITH CONSIDERATION OF WEIGHTS BY YEARS

Year	Revenues	NCAB	CAB	CRB	LTLB	STLB
2007	18 286	0.250	0.727	0.496	0.037	0.446
2008	19 403	0.217	0.752	0.542	0.033	0.395
2009	24 648	0.213	0.779	0.559	0.020	0.422
2010	23 594	0.237	0.744	0.482	0.028	0.488
2011	23 133	0.230	0.768	0.360	0.039	0.539
2012	19 817	0.232	0.741	0.457	0.064	0.472
2013	13 024	0.217	0.768	0.449	0.043	0.506
2014	11 865	0.187	0.786	0.446	0.034	0.507
2015	11 392	0.190	0.791	0.387	0.033	0.556

#### IV. INVESTIGATION OF DEPENDENCIES BETWEEN YURGA CITY MACRO-PARAMETERS AND SMALL ENTERPRISE ECONOMIC PARAMETERS

To investigate the dependencies between the economic parameters of Yurga and the economic performance of small enterprises, the correlation coefficient between the pairs of variables was used: each of the microeconomic parameters under study and one of the economic macro-parameters. All calculations were carried out in the information system previously developed by one of the authors [1] and in the MS Excel software program. For the calculated correlation coefficients, an evaluation of the significance was made based on the Student t-criterion:

$$t_{pac} = \frac{|r|}{\sqrt{1-r^2}} \sqrt{n-2}, \quad (1)$$

where  $r$  – correlation coefficient,  $n$  – sample size. Correlation is considered significant with  $t_{pac} > t_q(n-2)$ . Here,  $t_q(n-2)$  is the critical value of Student's statistics at the significance level  $q$ . For  $q=0.05$  and  $n=9$  the value is  $t_q(n-2) = 2.36$  [11].

Table. 4 presents the results of calculating the correlation coefficients between the aggregated economic parameters of small businesses and the city macro-parameters. Significant correlation coefficients for the Student's criterion are highlighted against a dark background.

TABLE IV. CORRELATION COEFFICIENTS BETWEEN CITY ECONOMIC PARAMETERS AND AGGREGATED MICRO-PARAMETERS

Parameters of the city	Micro-parameters		
	Revenues NCAB	CAB CRB	LTLB STLB
UTII for certain activities	-0.610 -0.549	0.518 -0.729	0.453 0.799
Number of individual entrepreneurs	0.942 0.545	-0.346 0.501	-0.224 -0.517
Number of small enterprises	-0.810 -0.597	0.491 -0.636	0.417 0.738
Personal income tax	-0.510 -0.402	0.370 -0.577	0.676 0.581
Taxes on comprehensive income	-0.621 -0.558	0.526 -0.732	0.446 0.804
Average monthly nominal income per capita	-0.711 -0.776	0.701 -0.659	0.226 0.752
Population	0.357 0.288	-0.335 0.807	-0.410 -0.862
Number of large and medium-sized enterprises	0.531 0.573	-0.604 0.720	-0.218 -0.852

Table. 5 provides options for explaining the existence of a significant correlation between the city economic parameters and aggregated micro-parameters. The city parameter "The ratio of the population cash income value per capita to the value of the subsistence minimum" is excluded from the table because it does not have any meaningful connection. In addition, the city parameters "Average annual subsistence minimum per month", "Average monthly wages without social payments", "Average monthly nominal income per capita" and "Consumer spending per capita per month" showed virtually identical correlation with the micro-parameters "Revenues", "NCAB", "CAB" (except for the parameter "Average monthly salary without social payments," for which a significant correlation with CRB was revealed instead of CAB) and "STLB". For this reason, the conclusions on these parameters are combined in Table 5.

TABLE V. EXPLANATION FOR THE SIGNIFICANT CORRELATION BETWEEN THE CITY ECONOMIC PARAMETERS AND AGGREGATED MICRO-PARAMETERS

City parameters	Micro-exponent / value of correlation coefficient	Explanations for correlation
UTII for certain activities	CRB -0.729	The more the UTII is taken from small businesses, the less money is left to form capital and reserves
	STLB 0.799	The more active the small business uses short-term liabilities, the more active it is and pays more taxes

Continuation Table V. Explanation for the significant correlation between the city economic parameters and aggregated micro-parameters

Number of individual entrepreneurs	Revenues 0.942	The fewer the small entrepreneurs in the city, the greater the average revenue from small businesses
Number of small enterprises	Revenues 0.810	The more the small enterprises, the higher the average revenue. It is likely that a good business environment affects the growth of the number of small enterprises and the increase in their average revenues
	STLB 0.738	The more the small enterprises, the more actively they use short-term liabilities for their activities
Personal income tax	LTLB 0.676	The more actively the small business uses long-term liabilities in its activities, the more funds it directs to pay for labor and the more it pays personal income taxes
Taxes on comprehensive income	CRB -0.732	With an increase in the share of capital and reserves, small business enterprises reduce the payment of taxes on total income, i.e. the taxable base decreases
	STLB 0.804	With the growth of short-term liabilities, the payment of taxes on aggregate income increases. Probably, more active use of short-term liabilities increases the taxable base
Average annual subsistence minimum per month <sup>1)</sup> Average monthly wage excluding social payments <sup>2)</sup> Average monthly nominal income per capita <sup>3)</sup> The level of consumer spending per capita per month <sup>4)</sup>	Revenues 1) -0.781 2) -0.689 3) -0.711 4) -0.705	In the case of an increase in the urban parameter, small businesses receive less revenue, because most of the population income goes to basic needs
	NCAB 1) -0.797 2) -0.679 3) -0.776 4) -0.736	With the growth of the city parameter, small business enterprises have less opportunities to invest in long-term assets, thus most money is spent on their current activities
	CAB 1) 0.760 2) – 3) 0.701 4) 0.685	With the growth of the city parameter, the small business actively invests in current assets to maintain its current

	CRB 1) – 2) -0.681 3) – 4) –	With the growth of average wages, small enterprises reduce their capital and reserves. It is possible that those funds that could go to the formation of capital go to wages and related taxes and contributions
	STLB 1) 0.776 2) 0.767 3) 0.752 4) 0.752	With the growth of the urban parameter, small businesses are more active in using short-term liabilities to maintain their current activity
	CRB 0.807	As the population grows, the capital and reserves of the small businesses grow
	STLB -0.862	As the population grows, short-term liabilities are reduced. It is probably affected by the increased competition between the population and the small enterprises for "short" money
Population	CRB 0.720	With the increase in the number of large and medium businesses, capital and reserves rise in small business. This is probably affected by increased competition between the small business and the large and medium businesses
	STLB -0.852	With the growth in the number of enterprises in the large and medium businesses, a decrease in the share of short-term liabilities is observed. It may be due to the increased competition between large and medium businesses and small enterprises for "short" money

## V. CONCLUSION

Based on the results of the studies, the following outcome was obtained.

1. The list of economic and social parameters characterizing a single city was analyzed. The ways of selection of the most significant urban parameters for studying their interrelation with small business were substantiated.

2. The choice and composition of aggregated

micro-parameters of small businesses for the study was justified. The transformation of the micro-parameters under study into a format optimal for research was described.

3. The existence of significant correlation links between the city economic parameters and the aggregated micro-parameters of small business on their territory was proved. The significance evaluation was carried out based on the Student's t-criterion.

4. The economic justification for the existence of a correlation between the economic and social parameters of the city and micro-parameters was given.

The results obtained and the conclusions drawn from them are intended, on the one hand, to help small businesses find their place in the economy of the "native" city and determine the most optimal strategy for their development. On the other hand, research materials can be used by municipalities as a basis for development projects and programs for small business in their jurisdictions.

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