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Interaction of the Government and Business in Solving Environmental and Socio-Economic Problems of Russian Regions

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Abstract: - This article studies the possibilities of using existing and developing tools for interaction between authorities and business structures to solve regional problems: economic, social, environmental, etc. Critical discourse analysis of the authoritative researchers' opinions and content analysis of the scientific teams' research results formed the basis of the logical and cogitative conclusions of the team of authors and made it possible to form the authors' position regarding the possibilities of assessing the manifestation degree of the partnership model of interaction between government and business structures through the development of its tools. To do this, the team of authors had to revise the methodological approach to the formation of an integral indicator that characterizes the interaction level between government and business from the standpoint of updating its tools, implementing the tripartite interaction aspect considering the growing role of society. Additionally, to introduce an environmental interaction component in the format of a national environmental rating. The quality of interaction between government and business in the partner model, in authors' opinion, could be characterized through the development level of relevant interaction tools. Based on the identification of modern trends in the interaction between government and business, the authors substantiate the expediency of adjusting the methodological approach to assessing the level of interaction between government and business: emergence and growth of the role of the third party of interaction – society; strengthening the effect of interaction through the complex use of tools; considering environmental factors as an integral part in achieving the most important goal of interaction between government and business – improving the life quality of the population of the country (region). The importance of the research is due to the increment of scientific knowledge in the field of developing a methodology for determining a quantitative indicator that characterizes the level of interaction between government and business achieved in the research area, the integrative nature of the modified index, which allows accumulation of the identified development trends of all actors. As well as the declaration of the approach to calculating the index of interaction between government and business as a geometric mean, which allows to update a set of significant interaction tools constantly depending on the real situation with interaction in the country and regions.

Key-Words: government, business; interaction tools; interaction assessment; environmental rating; region.

1 Introduction

The interaction between government and business covers all new areas and areas, while developing the tools used for its monitoring and evaluation. The problem of monitoring and evaluation becomes relevant given that the evaluation should be comprehensive and integrated. Increased importance given to certain aspects of interaction depends on what specific criteria are reflected in the integral indices, which also defines which areas of interaction will develop rapidly, since the assessment always performs control and regulatory functions.

Previous studies by the team of authors demonstrate that the partnership model is the main interaction model between government and business in modern practice. In the course of the study, the team of authors identified forms (tools) of interaction between government and business structures, which are the most common and successfully functioning at the regional level; such forms include: public procurement, public-private partnership (PPP), initiative budgeting (IB), implementation of government programs, regulatory impact assessment (RIA), support for non-profit organizations (NPO), and corporate social responsibility of business (CSR). It should be

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noted that CSR has an implicit interaction nature between government and business to a greater extent. Implicit forms (tools) can also include lobbying, activities of professional associations (mediators, intermediaries, etc.), unions of enterprises (for example, advisory bodies under government bodies) [1].

A set of tools is being developed; its main function is related to the involvement of the population in the interaction between government and business as a third party and an active participant: joint setting of development priorities, selection of projects for financing, projects' co-financing, participation at the stage of its implementation as an executor, project monitoring. Of particular relevance is the interaction between government and business in environmental matters, which led to the need to take this aspect of interaction into account when forming the integral index.

The main problem of the research is the need to develop and improve the partnership quality between government and business to solve environmental and socio-economic problems of Russian regions. According to the authors, the problem can be solved by recognizing the importance of tracking the dynamics and constantly updating the composition of the interaction tools. Methodological substantiation of this problem is seen by the authors in the use of a modified integral index. Today, for example, the interaction subject questionnaire method in terms of its quality is widely used, which, in our opinion, is not of a systemic nature. The project approach to assessing the interaction between government and business is also interesting, which involves the calculation of indicators of budgetary, commercial, and economic or social efficiency. Nevertheless, the methodology on which this approach is based, as a rule, involves the assessment of a specific project of interaction between government and business within its life cycle. As an alternative to using an integral index, it is possible to consider construction of a factorial model of interaction. But, according to the team of authors, this tool is more complex than expert assessments and extrapolation of trends, which have been used in the process of work with the integral index. Probably, the use of factor analysis will be the next step in the study of the stated topic.

1.1 Literature Review / State–of–Arts / Research Background

Many studies by Russian, European, American scientists are devoted to the problematic development aspects of effective forms, models, and tools for interaction between authorities and business structures. A great contribution to the development of this problem was made by the works of such scientists as: Varshavsky A.E. [26], GlazyevS.Yu. [14], Ivanter V.V. [12], Castells M. [8], Lvov D.S. [11], Makarov V.L. [16] and others.

There are many publications that analyze Russian regional interaction practices between government and business [7], [10], [20], etc.

Methodological approaches to the issues of assessing the interaction between government and business structures were considered in the works of many domestic researchers [3], [13], [15], [21], [9] and others.

However, interest in assessing the interaction level between government and business is not weakening and is becoming especially relevant with developing approaches to interaction, the expansion of the number of interaction subjects and the revision and updating of interaction tools.

2 Methodology

Based on a preliminary critical discourse analysis of the opinions of authoritative researchers, the article justifies expediency of assessing the interaction level between government and business based on the breadth of representation and the formation level of its individual forms (tools). The team of authors analyzed the statistical reviews prepared by the Federal State Statistics Service, the Ministry of Economic Development of the Russian Federation and the Stavropol Krai and the empirical data presented in the official reviews of research agencies in dynamics for the period 2017-2020, as well as the opinions of authoritative researchers obtained from the results of content analysis. Using a logical-thinking analysis and based on previous studies, the team of authors found that a partnership model of interaction between government and business structures is inherent for all regions of the Russian Federation, the differences are due to the degree of its development. Based on a comparative analysis of the manifestation level of significant interaction tools between government and business structures in the selected regions, the authors drew conclusions regarding the development degree of the partnership model in the subjects under study. It has been established that the Stavropol Krai is characterized by a low level of partnership model development. Nevertheless, all the main forms (tools) of partnership interaction are presented in the subject under study, a number of which is developed as an initiator or a pilot region. The use

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of the didactic multidimensional tools technology, particularly the formation of a logical-semantic model, allowed the authors to develop a methodological approach when constructing an integral criterion for assessing the interaction between government, business, and the population within the framework of a diagnosable partnership model and to present the predictive value of the integral criterion for the subject under study based on the correlation-regression analysis and the method of extrapolation of trends. Thus, noting the interaction between government and business as a developing phenomenon, the team of authors diagnosed the emergence of new tools for interaction and the strengthening of its qualitative characteristics, as well as the transition to a tripartite nature of interaction with an increase in the society's role. Along with an increase in the representation of the environmental component in the tools for interaction between subjects at the regional level, all this led to the expediency of revising the methodology for constructing an integral criterion, including the use of a national environmental rating.

In particular, the researchers, using the correlation and regression analysis methodology, determined that the exponent acts as an approximating function for each of the components in the integral criterion. Using an exponential approximation to extrapolate the identified trends, the authors obtained the projected values of individual indices as part of the integral criterion, and then calculated the projected value of the integral criterion using the geometric mean.

The team of authors used the method of critical analysis of various ratings related to the research problem as one of the main research methods: analysis and evaluation of the interaction between government and business within the partnership model. According to the authors, the geometrical mean used in the methodology for calculating the integral indicator involves the integration of various interaction forms between government, business, and the population to derive a single comprehensive assessment and give weight to the development and diversification of relevant instruments. It should be noted that the authors consider the main purpose of forming ratings as to give importance to the problem and individual factors that reduce or increase its severity, monitor the state of the problem, and form a response in the form of a regulatory impact. That is why the

authors proposed to introduce the assessment of the interaction between government, business structures, and society into the integral indicator as a component of the national environmental rating.

3 Case studies/ experiments/ demonstrations/ application functionality

The team of authors have determined the Stavropol Krai as the study object on the possibility of using a partnership model to solve regional problems of the constituent entities of the Russian Federation: economic, social, environmental; in 2020, the Krai ranked 30th in the rating of Russian regions in terms of investment climate (rating of "RAEX-Analytics" LLC (RAEX)), which belongs to group 3B1 (reduced potential-moderate risk). 4 leaders in this classification (A1), 3 outsiders (3D), 3 regions occupying the middle of the rating (2B), as well as regions that are on the same level with the Stavropol Krai in terms of investment potential (3B1) were selected to identify the prevailing trends in the issue under study.

To get an idea of the development degree of the partnership model, these regions can be compared in terms of investment climate level and socio-economic situation, adding one of the main types of interaction between government and business to the analysis, which is PPP (Figure 1). It is also advisable to reflect the interaction of government and business structures in solving environmental problems that are relevant for Russian regions. This diagram will allow to assess the extent to which the partnership between government and business influences the development of the region and its well-being.

The investment climate, the level of socio-economic development, the state of ecology and environmental protection presented in the diagram are the result of joint activities of the authorities, business, and society to resolve environmental and socio-economic problems of Russian regions. One of the most effective tools for interaction between government and business, and, accordingly, for resolving the identified problems, is PPP, so the authors of the study reasonably assumed the presence of a correlation between the indicators characterizing these factors.

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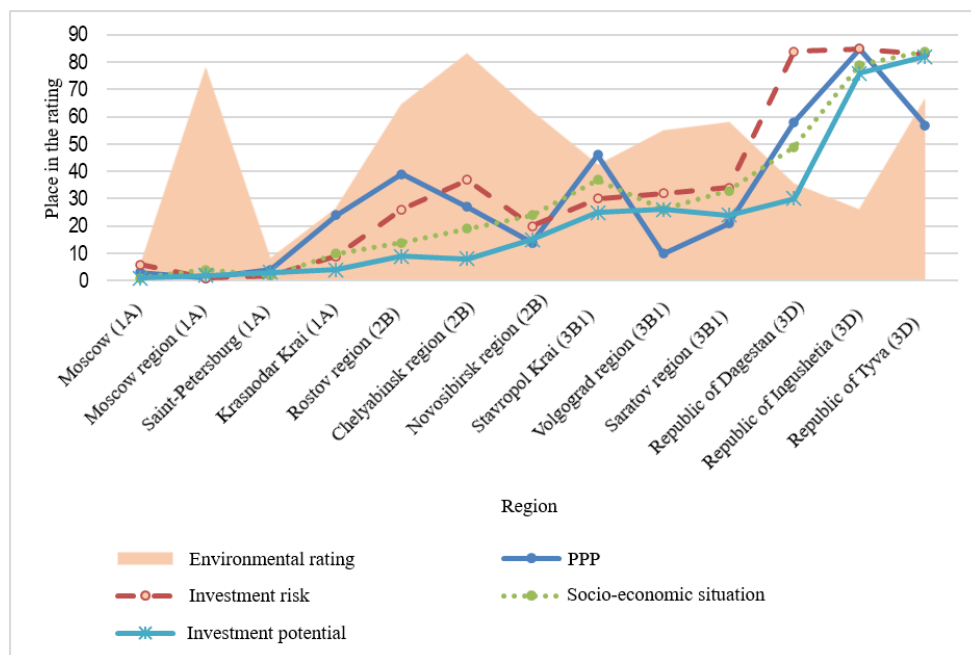Valentina Parakhina

Fig. 1: Rating of regions by investment climate, socio-economic status, ecological state and environmental protection, the level of PPP development in certain regions of the Russian Federation in 2020.
Source: Compiled by the authors based on the materials [2], [22]−[23]

The graph shows that the rating of PPP development in the regions correlates with indicators of the investment climate and socio-economic situation. That is, the improvement of the socio-economic situation directly affects the activation of the investment climate in the region. There is also an inverse relation: attraction of additional investments from individuals, active implementation of various federal and regional programs, tenders and other instruments of socio-economic development contribute to the region's activation in various areas, making it prosperous and attractive for the population and entrepreneurs and thus more interesting for new investments.

The most common and successfully functioning forms (tools) of interaction between economic entities in the Stavropol Krai will be considered within the framework of this study, such as public procurement, PPP, IB, government programs implementation, support for NPO, RIA, and CSR. The dynamics of environmental rating indices will be analyzed as well.

In general, it is worth noting that there is a positive trend in the state programs financing every year. Thus, participation in national projects is also becoming more attractive for private businesses.

For clarity, let us consider the rating distribution of the regions of the Russian Federation by the PPP efficiency level in recent years (Table 1).

Table 1. PPP efficiency rating of the regions of the Russian Federation for 2017-2020.

Region of the Russian Federation	Year				Absolute deviation		
	2017	2018	2019	2020	2018/2017	2019/2018	2020/2019
Rostov region	50.4	67.4	40.5	6.7	+17	-26.9	–
Krasnodar Krai	37.0	39.8	35.18	8.9	+2.8	-4.62	–
Stavropol Krai	48.0	45.4	37.4	5.5	-2.6	-8	–
Saratov region	36.4	45.8	44.7	9.2	9.4	-1.1	–
Note - in 2020, there was a change in the methodology for rating calculation; the rating for 2019 was calculated using the transition methodology							

Source: Compiled by the authors based on the materials [25]

Analyzing the data in the table, it can be concluded that the leader in terms of the PPP

development level in 2019 was the Saratov region followed by the Rostov region. The least effectively

developed PPP is in the Krasnodar Krai. As it can be seen, the PPP efficiency has significantly decreased in 2019, which is due to the imperfection of the regulatory framework, the weak competence of state bodies, as well as private business on PPP issues, inequality of the parties, political instability, etc. Interestingly, 2020 showed a significant positive trend in the Krasnodar Krai. This is partly due to a change in the methodology for calculating the rating, which began to consider the dynamics of PPP projects' implementation. At the same time, priority in calculating this factor is given to the regions implementing long-term projects under concession agreements and agreements on PPP, MPP with the largest volume of contracted investments.

The next important form of interaction between government and business is IB. In the authors' opinion, the methodology of the Scientific and Research Financial Institute of the Ministry of Finance of Russia [18] is suitable as a basis for assessing the IB level in the Stavropol Krai. The rating of the subjects of the Russian Federation in terms of the level of budget data openness for 2018-2020 will be taken as an indicator for analysis; it is shown in Figure 2. Let us consider the position of the Stavropol Krai in relation to the nearest regions, such as: the Saratov region, the Krasnodar Krai, and the Rostov region.
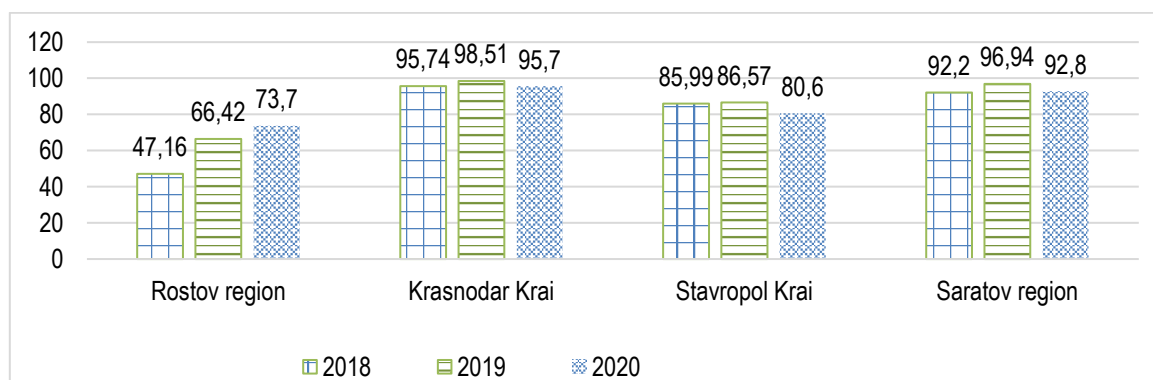

Fig. 2: Rating of regions of the Russian Federation by the development level of initiative budgeting in 2018-2020.
Source: Compiled by the authors based on the materials [18].

Thus, it can be concluded that the Stavropol Krai maintains its position in the field of IB falling into group A every year: a very high level of budget data openness (80% or more of the maximum possible number of points). In the overall ranking of Russian regions, Stavropol Krai ranked 12th in 2018, 12th in 2019, and dropped to 20th in 2020.

Analyzing the rating's dynamics, it can be said that in 2020 there was a decline in the IB index in each region under consideration associated with the

epidemiological situation in the country, which affected the "freezing" of many interaction forms between government, business, and the population [6].

In order to assess the state of public procurement in the Stavropol Krai, let us analyze the position of the region in the ranking in relation to neighboring regions (Figure 3).
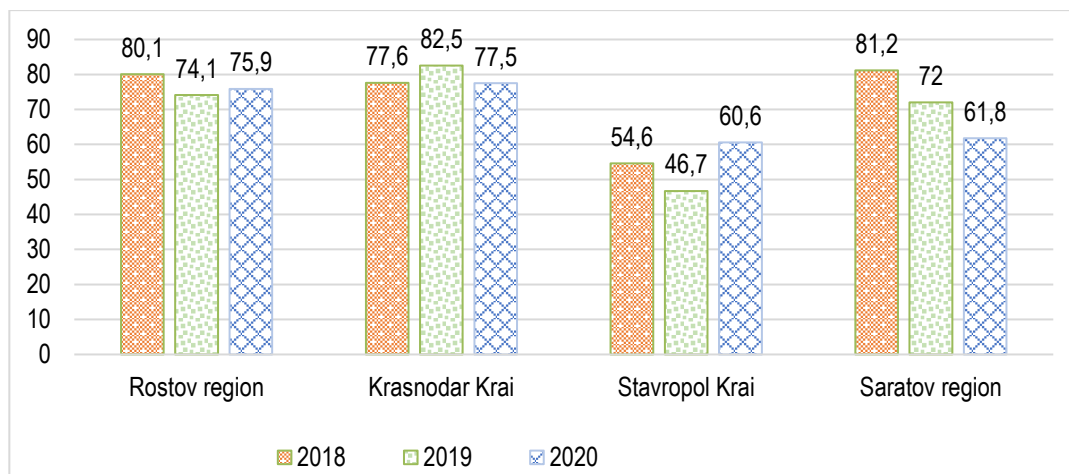
Fig. 3: Competitiveness rating of public procurement of regions of the Russian Federation for 2018-2020
Source: Compiled by the authors based on the materials [24]

Thus, it can be concluded that the efficiency of public procurement in the Stavropol Krai is significantly lower than in the analyzed regions. However, it should be noted that in 2020, the region experienced the largest peak in this indicator (+13.9%), which is associated with the implementation of orders most significant for the region.

Additionally, such an interaction form between government and business as CSR is being implemented in the Stavropol Krai. Socially significant events in the region involve both large corporations that seek to increase the loyalty of their consumers and non-profit organizations that participate in social projects exclusively on a volunteer basis.

To analyze the NPO support level in the Stavropol Krai, let us turn to the rating of the subjects of the Russian Federation based on the implementation results of mechanisms to support socially oriented non-profit organizations and social entrepreneurship (Figure 4).
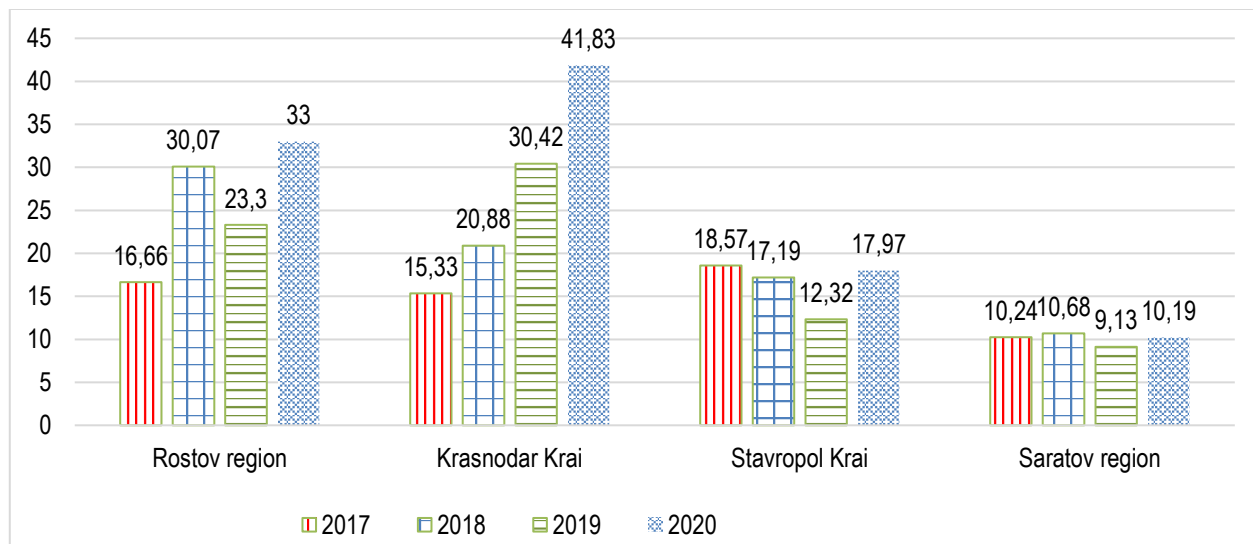

Fig. 4: Indicator of the NPO support level in the regions of the Russian Federation for 2017-2020
Note - Compiled by the authors based on the materials [17].

As it can be seen, the Krasnodar Krai occupies a leading position in terms of this indicator and is rapidly developing. It should be noted that in 2017, the Krasnodar Krai was included in one of the weakest groups "Regions taking the first steps towards success"; in 2018 it entered the category

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"Regions with an average level", and in 2019 it already became the "Leading Region". Along with the Stavropol Krai, the rest of the regions under consideration occupy weaker positions in this rating. So, in 2017 the Stavropol Krai belonged to the "Regions with an average level" and in 2018-2020 it went down to "Regions taking the first steps towards success", having lost 6.25 points in 2 years. In 2020, The Stavropol Krai has not yet returned to the indicator's level of 2017. However, it can be noted that the NPO support level in the regions under study has a positive trend in 2020.

Next, the regulatory impact assessment (RIA) on the territory of the Stavropol Krai will be analyzed. RIA is considered the core of regulatory policy [5].

Since 2013, The Stavropol Krai has become one of the pilot regions that have introduced the RIA procedure. The RIA procedure model used in the region involves holding public consultations both by the developers of draft acts and by the authorized body, which ensures publicity and transparency of this procedure. Undoubtedly, this is one of the interaction forms between government and business structures.

Let's consider the rating position of RIA in the region in relation to neighboring regions (Table 2).

Table 2. Rating of Russian regions in terms of the quality of the regulatory impact assessment in the constituent entities of the Russian Federation for 2018-2020

Region of the Russian Federation	Year		
	2018	2019	2020
Rostov region	good	average	average
Krasnodar Krai	highest	highest	highest
Stavropol Krai	highest	good	good
Saratov region	good	good	average

Source: Compiled by the authors based on the materials [5].

According to the Methodology of the Ministry of Economic Development of Russia, regions could fall into one of 4 groups: from 80 to 100 points - "Highest level"; from 60 to 79 points - "Good level"; from 40 to 59 points - "Satisfactory level"; from 0 to 39 points - "Unsatisfactory level" [5].

As it can be seen, for the past 2 years the Stavropol Krai has been among the regions with a good level of RIA receiving from 60 to 79 points and overtaking such regions as Rostov and Saratov regions.

Since the relevance of the environmental agenda is growing every year and all ongoing investment projects and public initiatives necessarily include an environmental component, it seems appropriate to track the dynamics of the environmental state and interaction between government and business structures in environmental protection issues in the regions under study (Figure 5).
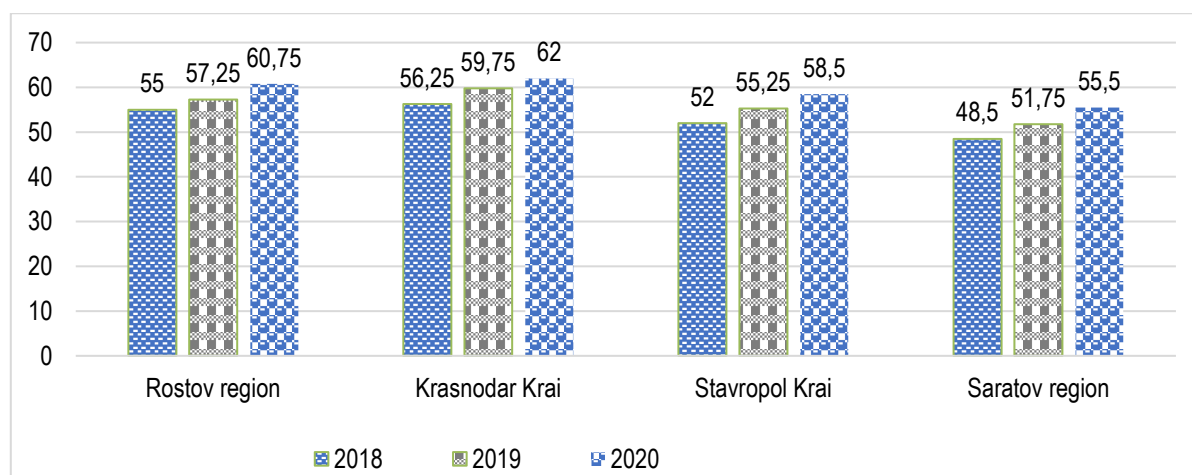

Fig. 5: Average indicator of the national environmental rating in the regions of the Russian Federation for 2018-2020
Note - Compiled by the authors based on the materials [2].

Histograms indicate the positive dynamics of the environmental component in the studied regions. As in most indicators of interaction between government and business, the Krasnodar Krai is in the first place. The Stavropol Krai is in the third place. The highest growth dynamics is demonstrated by the Saratov region (by 14.4% over three years) and the Stavropol Krai (by 12.5% over three years).

Thus, it was revealed that the main interaction types between business and government in the Stavropol Krai are the following: government programs implementation, PPP, IB, public procurement, business CSR, RIA and NPO support.

All interaction directions necessarily imply an environmental component, which is reflected in the indicators of the national environmental rating indices. Almost every identified form of interaction between government and business in the region is developing quite successfully.

Let us determine and compare the interaction level between government and business in the regions of the Russian Federation by summing up the places occupied by the regions for each of the interaction forms for 2020 (Table 3). The regions considered in this study will be taken as a basis.

Table 3. Comparative assessment of the interaction level between government and business in the regions of the Russian Federation based on the summation of places for each type of interaction for 2020

Region	Form of interaction between government and business						
	PPP	State procurements	IB	RIA	NPO support	Environmental rating	Total
Rostov region	3	2	4	3	2	2	16
Krasnodar Krai	2	1	1	1	1	1	7
Stavropol Krai	4	4	3	2	3	3	19
Saratov region	1	3	2	3	4	4	17

Among the regions under consideration, the Krasnodar Krai has the highest score of interaction between government and business; it is followed by Rostov and Saratov regions, the last place is occupied by the Stavropol Krai. The earlier analysis of all interaction types between subjects in the regions allows to speak of a fairly high level of the partnership model development. However, the partnership model is only at the initial development level in the Stavropol Krai.

It is worth noting that this table allows to highlight interaction tools that require increased attention in terms of its further priority development.

For the purpose of a comprehensive analysis of the interaction mechanism between government and business, let us turn to the existing methodology for calculating the integral interaction indicator between government and business by D.V. Zubaidullina and identify the main problems that each subject of the considered interaction faces when implementing the partnership model [27].

Many authors note the absence of common indicator in regional management operational practice, which could characterize the total level of interaction of regional subjects, and propose their methodological approaches and specific methods

for its determination [3,4]; Anichin, V.L., Zhelyabovskiy, A.Yu., Angelina I.A., Roslavtseva E.A., et al.). To generalize the effectiveness of using one of the main interaction tools such as PPP, public procurement and IB in the Stavropol Krai, it is possible to use the integral indicator proposed by the author D.V. Zubaidullina, which reflects an assessment of the interaction between government, business, and the population [27].

The integral indicator under consideration implies the efficiency coefficient of interaction between subjects in the region (Intc.sub.) using the geometric mean value according to the formula [27].

$$\text{Intc. sub.} = \sqrt[3]{P \times G \times I}, \text{Eq.} \qquad (1)$$

where P *is* the level of PPP efficiency in the region;

G - efficiency level of public procurement in the region;

I - efficiency level of initiative budgeting in the region.

The overall interaction indicator between subjects in the Stavropol Krai in comparison with the nearest regions based on the results of 2018-2020 is calculated based on this formula. To do this, the data on the efficiency levels of PPP, public

procurement and IB by region is presented in Table 4.

Table 4. The indicator of interaction between subjects in the regions of the Russian Federation at the end of 2018-2020.

Region of the Russian Federation	Intc.sub.	P	G	I
2018				
Rostov region	63.4	67.4	80.1	47.16
Krasnodar Krai	66.6	39.8	77.6	95.74
Stavropol Krai	59.7	45.4	54.6	85.99
Saratov region	70.0	45.8	81.2	92.2
2019				
Rostov region	58.4	40.5	74.1	66.42
Krasnodar Krai	65.9	35.18	82.5	98.51
Stavropol Krai	53.3	37.4	46.7	86.57
Saratov region	67.8	44.7	72.0	96.94
2020				
Rostov region	33.5	6.7	75.9	73.7
Krasnodar Krai	40.4	8.9	77.5	95.7
Stavropol Krai	29.9	5.5	60.6	80.6
Saratov region	37.5	9.2	61.8	92.8
Note - in 2020, there was a change in the methodology for rating calculation by the level of PPP efficiency in the region; the rating for 2019 was calculated using the transition methodology				

Source: Compiled by the authors based on the materials [27, 19]

It should be noted that the data on the regions' rating by the development level of the PPP sector in 2020 are presented by the Ministry of Economic Development of the Russian Federation according to a new methodology approved by the Order of the Ministry dated December 19, 2019 No. 816. According to the new methodology, priority is given to the factor "Dynamics of PPP projects' implementation in the subject of the Russian Federation for the reporting year" since this factor characterizes the results of attracting investors and implementing PPP projects in the region in the reporting year. As a result, data for 2020 becomes incomparable with previous periods and cannot be used to identify trends. However, it can be noted that the leader of interaction has changed in the four regions under study. It is the Krasnodar Krai. The Stavropol Krai still ranks last among the regions under consideration.

Let us analyze the calculation results and present them in the form of regions' rating according to the integral indicator of interaction between government, business, and the population, having determined the absolute deviation of the indicator in question in recent years (Table 5).

Table 5. Rating of regions of the Russian Federation according to the integral interaction indicator between government, business, and the population in 2017-2020.

Region of the Russian Federation	Intc.sub.				Absolute deviation		
	2017	2018	2019	2020	2018/2017	2019/2018	2020/2019
Saratov region	52.8	70.0	67.8	37.5	17.2	-2.2	–
Krasnodar Krai	45.6	66.6	65.9	40.4	21.0	-0.7	–
Rostov region	41.1	63.3	58.4	33.5	22.2	-4.9	–
Stavropol Krai	48.2	59.7	53.3	29.9	11.5	-6.4	–
Note - in 2020, there was a change in the methodology for rating calculation by the level of PPP efficiency in the region; the rating for 2019 was calculated using the transition methodology							

Source: Compiled by the authors based on the materials [27, 19]

For clarity, the resulting rating is reflected in the form of Figure 6 analyzing the changes in the integral interaction indicator of subjects in the region for the period of 2017-2020.
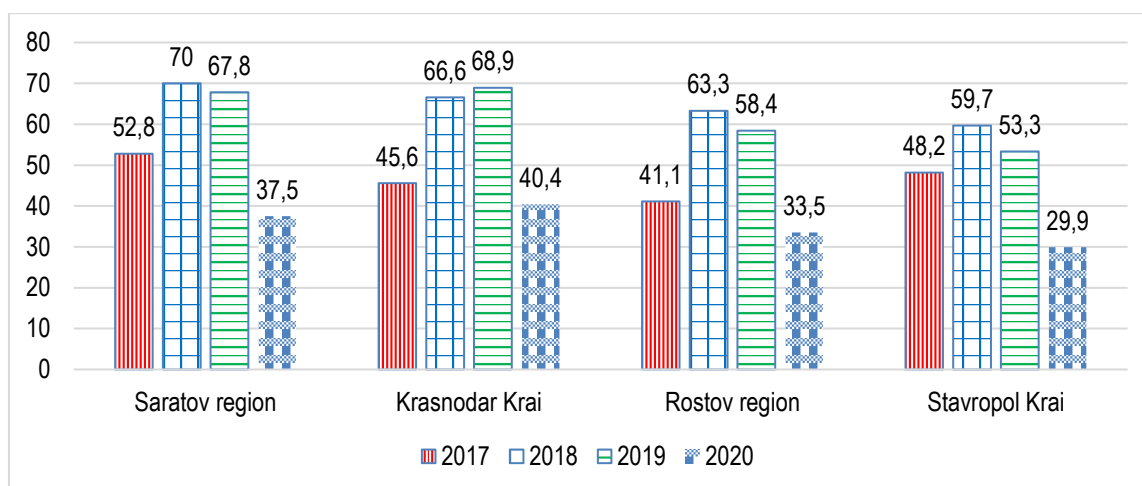
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Fig. 6: Rating of regions of the Russian Federation according to the integral interaction indicator between government and business for 2017-2020
Source: Compiled by the authors based on the materials [27, 19]

From year to year, the leading position was occupied by the Saratov region followed by the Krasnodar Krai and by the Rostov region among the analyzed regions of the Russian Federation. The Krasnodar Krai gradually reduced the lag from the leader and took a leading position in 2020, which was mainly due to the development of such interaction components as the efficiency level of public procurement in the region and the level of IB efficiency in the region. As it can be seen, the Stavropol Krai was in a strong position in 2017 but is currently lagging due to certain constraints.

According to the classification proposed by D.V. Zubaidullina, the Stavropol Krai together with the neighboring regions under consideration belonged to the 2nd category in 2017 in terms of the interaction level between government and business (Intc.sub. value from 43% to 54%, from 20th to 41st place) [27]. It should be noted that already starting from 2018, the situation has changed for all compared regions except for the Stavropol Krai. They moved to interaction group 1 with the Intc.sub. value from 55% and above - regions with a developed interaction mechanism between subjects. The Stavropol Krai remains in the 2nd category.

In the authors' opinion, a deeper understanding of the interaction between government and business requires the introduction of one more subject into the partnership model - the population - and consider the interaction as tripartite. All three subjects are closely interconnected, and their mutual motivational attitudes set effective directions for cooperation.

The general integral indicator of interaction between government, business, and the population discussed above has accumulated effectiveness

rating indicators of PPP, public procurement and IB in the region. Considering that other forms (tools) of interaction between authorities, business, and the population such as state programs implementation, support for NPO, business CSR, RIA are also developed in many regions of the Russian Federation, the problem of expanding the interaction tools that have found application in the calculation of the integral indicator becomes relevant. In general, the approach from the standpoint of regular tools' updating considering the realities of interaction between government and business structures can be considered appropriate.

The national environmental rating of regions reflects interaction aspects between government and society, government, and business in environmental matters and, as a result, the general state of the environment. Since in recent years an approach has been actively developed in terms of the social and environmental responsibility of business and the inclusion of an environmental component in the social reporting of an enterprise, it becomes expedient to include the regions' national environmental rating in a comprehensive assessment of the interaction between government, business, and society as a correction factor. The environmental rating reflects the topical aspects of trilateral cooperation, which have an increasingly strong impact on the investment attractiveness of both regions and individual investment projects. The inclusion of this correction factor will contribute to the growth of environmental issues' importance for their solution in a tripartite manner through the organization of interaction between government, business structures and society using the entire set of tools.

Thus, the new calculation of the integral indicator can be expressed as the formula

$$Intc.sub. = \sqrt[7]{P \times G \times I \times D \times R \times N \times E}, \text{ Eq. (2)}$$

where P - the level of PPP efficiency in the region;
G - the level of public procurement efficiency in the region;
I - the level of initiative budgeting efficiency in the region;
D - the level of government programs' efficiency in the region;
R - the quality level of the regulatory impact assessment in the region;
N - the level of support for non-profit organizations in the region;

E - a correction factor reflecting the level of the environmental component in the region.

It should be noted that there is no rating for evaluating the effectiveness of state programs' implementation in the regions of the Russian Federation (D) yet; currently, the RIA quality level indicator (R) does not have a specific quantitative expression, so it is not advisable to include these indicators for calculation within the framework of this study.

The exponential approximation applied for each form (tool) of interaction separately will allow to obtain a predictive integral indicator of interaction between government and business in the region for 2021 (Table 6).

Table 6. Forecast indicator of interaction between subjects in the regions of the Russian Federation in 2021.

Region of the Russian Federation	Intc.sub.	P	G	I	N	E
Rostov region	59.04	41.48	72.64	95.87	39.03	63.64
Krasnodar Krai	63.62	35.44	79.06	96.61	58.92	65.35
Stavropol Krai	42.86	33.78	59.56	79.06	14.64	62.08
Saratov region	43.24	51.68	54.21	94.57	9.62	59.32

Source: Compiled by the authors based on the materials [27; 17; 19; 20]

It should be noted that the data obtained are only indicative and predictive, and therefore may differ from reality. The obtained indicators (Intc.sub.) are calculated considering the average annual growth of each of the criteria, that is, in the natural environment without any intervention. A comparative analysis of all tools allows to draw conclusions about the development degree of each tool and its impact on the overall situation of interaction.

A comparison of the integral interaction indicators calculated using the old and improved methodologies is presented in Table 7.

Table 7. Comparative analysis of integral interaction indicators between subjects in the regions of the Russian Federation in 2019, 2021

Region of the Russian Federation	Intc.sub. 2019 old methodology	Intc.sub. 2019 new methodology	Intc.sub. 2021 new methodology	growth rate, 2021/2019
Rostov region	58.4	48.41	59.04	22.0
Krasnodar Krai	65.9	55.35	63.62	14.9
Stavropol Krai	53.3	40.04	42.86	7.0
Saratov region	67.8	43.02	43.24	0.5
Note - in 2020, there was a change in the methodology for calculating the PPP rating, given that 2021 was predicted based on empirical data obtained using the old methodology, it is advisable to compare 2021 with 2019.				

The presented analysis demonstrates that the values of integral indicators fell sharply when the level of NPO support quality in the regions was included in the calculation, which is associated with weak development of the area under consideration. The use of a correction factor that considers the environmental component of the

interaction between government, business, and the population did not make significant adjustments to the change in the integral indicator but fixed the change in the interaction leaders among the studied regions. This once again indicates the importance of the correction factor. The assessment obtained using the new formula will be more comprehensive

as it includes an expanded understanding of the interaction between government, business, and the population. It must not be forgotten that the application of the proposed recommendations will improve the efficiency of each interaction form between government and business, and, as a result, the overall Intc.sub.

4 Conclusion

The team of authors obtained new scientific results in the process of work, which are reflected in the following.

Firstly, the characteristics of the existing interaction models between regional authorities and business helped to reveal that the partner model is in the development stage on the territory of the region under study. The main forms (tools) of interaction between government and business are the following: PPP, IB, implementation of government programs, public procurement, support for NPO, RIA and business CSR. Each given form (tool) has a different development level; for example, IB is very well developed in the region, while NPO support is at a rather low level. All interaction directions necessarily imply an environmental component, which is reflected in the indicators of the national environmental rating indices.

Secondly, economic, social, environmental problems were identified and the effectiveness of interaction between authorities and business structures in the Stavropol Krai was assessed using the general integral interaction indicator of subjects in the region proposed by the author D.V. Zubaidullina [27]. Thus, the Stavropol Krai has integral indicators typical for regions with an average level of interaction development between subjects, which is a good result. The main negative side of subjects' interaction in the region includes possible risks for all sides of joint activities, which may adversely affect the effectiveness of this cooperation.

Thirdly, recommendations were developed during the study on the formation of a partnership interaction model between regional authorities and business in the Stavropol Krai. The main developments include consideration of subjects' interaction in the region in the form of a tripartite interaction (state, business, population).

It is advisable to indicate the following as the main directions for interaction development between subjects in the region: creation of favorable conditions for cooperation in the region, development of existing and introduction of new

forms of interaction between subjects, constant monitoring, and evaluation of interaction results between government and business in its individual forms and tools.

Fourthly, the authors note that the forms (tools) of interaction are developing and improving, new tools appear that are associated with a change in the interaction quality and an expansion in the number of subjects of interaction (introduction of the population as the third subject of interaction to the model). Accordingly, approaches to assessing the level of interaction and the development degree of the partnership model in the region should also be developed. It is expedient to calculate the general integral indicator of the subjects' interaction in the region as the geometric mean of this interaction considering all the main existing forms (tools) of interaction. This will contribute to the further improvement and monitoring of all the main forms (instruments) of interaction between subjects in the region to strengthen and develop the partnership model of interaction.

The severity of environmental and socio-economic problems will decrease in the process of improving the quality of partnership between government and business. This will become possible as the partnership model develops, which will be fully facilitated by regular monitoring of the integral interaction indicator dynamics proposed by the team of authors.

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