

Influence of investment climate of Russian Federation constituent entity on regional statistic indicator

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Abstract—The article determines the practical utility of applying Pearson correlation coefficient to the series of indicators of the National investment climate index and statistic indicators of the social and economic development of the constituent entities of the Russian Federation. The article is dedicated to the problem of estimating the relation between the region position in the investment potential index and the indicator of the social and economic development. It helps to reveal the possibilities and constraints of applying different approaches to estimate local authorities' efforts. The data sources were the indicators of the National investment climate index and statistic indicators of the social and economic development. The indicators were tested for correlation with the help of Pearson correlation coefficient. The achieved results demonstrate a very weak or weak correlation between a region position in the National Index and its level of social and economic development according to the statistic. The study revealed the causes which make the veracity of the achieved results reduce. Having eliminated them, one can raise not only the accuracy, but also solve the problem of correlation between ratings and statistic data. The results of the given analysis demonstrated that the National Index methodology does not allow evaluating local authorities' efforts objectively. In other words, the measures of the National business initiative to improve the region investment climate are not reflected in high indicators of social and economic development. It is proposed to stimulate large and medium enterprises of the region.

Keywords— *the National Index; National business initiative correlation of socio-economic development; performance evaluation*

I. INTRODUCTION

The most popular and accessible form of presentation of investment attractiveness of regions are the ratings of

investment attractiveness. Initially, the process for the rankings came from the United States and turned out to be a complicated procedure. These methods require analysis of large amounts of information, in particular, on the credit history of the region, as well as a large number of subjective factors and assumptions. Methods of US rating agencies ("Moody's Investors, Standard & Poor's") have long been used without taking into account national and regional specificities. Therefore, at present, there is a tendency of creation of national rankings that serve as the alternative to the international ratings. One of the main differences between national and international rankings is that the national Agency escort ratings after the assignment offer information and analytical services.

Since the mid-1990s, in Russia the rankings engaged Agency "Moody's Investors, Standard & Poor's", "Expert RA" and the Bank of Austria. The desire to escape from the influence of international practices and to take better account of regional specifics has led to the emergence of the first Russian Agency "Expert RA" in 1997.

The first attempt to estimate the local authorities' efficiency was the Decree of President Putin V. of 28.06.2007 № 825 "On evaluating the efficiency of the activity of the executive government bodies of the constituent entities of the Russian Federation". According to the Decree, a list of 43 indicators to estimate the efficiency was approved. In 2012 President Putin V. signed Decree №1199 "On evaluating the efficiency of the activity of the executive government bodies of the constituent entities of the Russian Federation", which approved a list of 12 indicators [1].

RA Expert has introduced its own methodology to estimate investment potential, which uses both the statistic data and data of the survey among experts, investors and bankers [2].

At present, great efforts are aimed at implementing measures of the National business initiative to improve investment climate in Russia – to make the practice of running a business simple, cheap and quick. The achieved effect after implementing measures is estimated by conducting a survey among entrepreneurs. The main part of the indicators of the National investment climate index is based on the survey¹. The index is not the first and only one meant to stimulate the social and economic development of the regions.

In its turn, the National Index is aimed to reflect the ease of doing business and to make the regional authorities compete for investments at the regional level. For this purpose special conditions are formed: investment legislation is designed, investment promoting organizations and investment committees are set up, etc. Fixed investment indicator² is accepted as a key indicator reflecting investment activity. The indicator characterizes the business activity in the region/country, reflects the business trust in the economy development. The increased indicator comes before increased production output or quality change in product mix. However, the indicator depends more on the macro economic environment in the country/world and does not reflect efforts of regional investment institutes, because 90% of the indicator is made up of business operations like buying machinery and equipment, constructing and repairing premises. These operations are performed by existing businesses and they do not depend on the investment legislation.

High National Index indicators reflect both a region industry development and its state of economy as a whole.

The problem of interrelation between investment potential of regions and ease of doing business in Russia was studied by V.S. Levin [3]. He calculated paired Spearman rank coefficients of correlation between quantitative indicators, which characterize business regulation in 30 Russian regions, and indicators, which characterize the investment prospects (investment risks and potential), as well as inward investment volume.

As a result, the author notes that there is no evidence that territories with greater investment potential get more inward investments.

V.I. Menschikova [4] has surveyed a wide range of national and foreign methods for evaluation of the regional social and economic development level. In her work, she proves that the interval ranking is better than the overall one, which is often applied. She concludes that there is not any universal method containing a valid indicators list, which estimates the regional social and economic development level in a full and trustworthy way.

I.U. Zinchenko [5] has analyzed the methods, which estimate the efficiency of the activities of the executive

government bodies of the constituent entities of the Russian Federation and monitor the activities of the local, city and municipal districts governments. The author examines into the reasons why the evaluation procedures are not effective enough and notes that even if sophisticated evaluation methods are used, it does not bring about any substantive changes in the work of the state or municipal government bodies.

The use of expert assessments is an obvious drawback, namely, the subjectivity of the assessments, as well as experts, instinctively put average scores and rarely put extreme evaluation. Therefore, the right to give preference to statistical estimates, is more objective. Of course, sometimes one can not do without an expert evaluation, where the comparison can be made at a subjective level. The integral methods of ranking also have its disadvantages. Methods allow determining that one region is better than another, but do not show how it is superior to this region. The scales in these methods are selected by the expert method, which reinforces the subjectivity of the assessment.

A significant role withdrawn to expert estimates, leads to the fact that they can be viewed only from a position of trust or mistrust them. Summarizing, we can note the insufficiency of a methodological framework for assessing the investment attractiveness of different types of territories, including regions of the Russian Federation.

The article is dedicated to the factors, influencing the social and economic development indicators. It also tests a hypothesis that a region position in the National Index influences the key indicators of the regional social and economic development. The hypothesis is based on the following specification of the National Index: “The National investment climate index measures the efforts of the regional authorities to provide better conditions for doing business”. Thus, the leaders of the National Index provide favorable conditions for doing business that has a positive impact on the region social and economic development indicators³, reflecting trends in industry and agriculture, investments, etc.

II. MATERIALS AND METHODS

In the course of the study, the authors compared the regions indicators according to the National Index of 2014-2016 [5]:

- The final rating
- Regulatory environment
- Institutes for business
- Infrastructure and resources
- Small businesses

and some social and economic development indicators of the Federal State Statistics Service:

- Index of the fixed investment volume in large and medium businesses.

¹ <https://asi.ru/investclimate/>

² as options: Investment in fixed capital per capita, or without a budget, or by large and medium enterprises, etc.

³ According to the authors of the rating

- Index of the volume of fixed investment in kinds of businesses.
- Index of industrial production in the sphere of manufacturing.
- Index of the farm production of all the farming units.
- Index of labour productivity against the level of 2011 (only 2014).
- Index of overall quantity of work performed in the sphere of construction, at comparable prices (percentage) (only 2014).

There is an increase in the number of small and medium businesses [8].

For this pair of series, the authors have calculated Pearson correlation coefficient, which reflects the degree of linear relations between two data series. The stronger the relation is, the closer the coefficient to +1 (positive relation) or -1 (negative relation).

The submitted results show that there is a very weak or weak correlation between the region's position in the National Index and statistic indicators. The medium correlation between some pairs of data (final rating – increase in the number of small businesses; regulatory environment – increase in the number of small businesses) can be explained empirically. Though negative correlation between the index of labour productivity and regulatory environment (and weak correlation between the index of productivity and the rest of the National Index indicators) is surprising – the higher the

level of regulatory environment, the lower the labour productivity is.

The index position and values were recoded into figures according to the following rule: group 1 – 1, group 2 – 2, value A – 1, B- 2, etc.

Besides that, to test the hypothesis that the statistic indicators reflect the region position in the National Index with some time lag (1-2 years), Pearson correlation coefficient was calculated for the National Index and statistic indicators of later years.

III. RESULTS

Before the analysis of the obtained results, it is necessary to answer the question: what values of the correlation coefficient indicate a strong dependence, and which are weak?

In different fields of knowledge, there are different coefficient interpretations; that is why in this work let us use the table from the book [9]

TABLE I. THE INTERPRETATION OF THE CORRELATION COEFFICIENT

The value interval of the correlation coefficient	Interpretation
0-0.2	Very weak correlation
0.2-0.5	Weak correlation
0.5-0.7	Medium correlation
0.7-0.9	Strong correlation
0.9-1	Very strong correlation

TABLE II. PEARSON CORRELATION COEFFICIENT VALUE FOR THE NATIONAL INDEX AND STATISTIC INDICATOR FOR 2014.

	index investment of large and medium	index investment full circle	index of manufacturing industries	index of agricultural production in all categories	index of agricultural organizations	index performance	index construction	increase in the number of small businesses
overall rating	-0.07	0.05	-0.34	0.30	0.38	-0.44	0.17	0.61
regulatory environment	-0.19	-0.06	-0.36	0.15	0.23	-0.55	0.15	0.50
institutions for business	0.02	0.16	-0.14	0.40	0.41	-0.25	-0.03	0.38
resources and infrastructure	0.40	0.39	0.00	0.15	0.14	-0.27	0.11	-0.16
small business	-0.16	-0.26	0.26	0.03	0.06	-0.46	-0.29	0.16

TABLE III. PEARSON CORRELATION COEFFICIENT VALUE FOR THE NATIONAL INDEX AND STATISTIC INDICATORS FOR 2015.

	index investment of large and medium	index investment full circle	index of manufacturing industries	index of agricultural production in all categories	index of agricultural organizations	increase in the number of small businesses
overall rating	-0.08	-0.14	-0.32	-0.16	-0.25	-0.06
regulatory environment	0.09	-0.02	-0.25	0.13	-0.01	0.06
institutions for business	-0.14	-0.15	-0.24	-0.18	-0.21	0.15
resources and infrastructure	-0.07	-0.12	-0.24	-0.26	-0.33	-0.33
small business	-0.08	-0.12	-0.17	-0.17	-0.23	-0.03

The coefficient of correlation between the National Index and statistic indicators of 76 regions demonstrates a weak correlation between them [2].

TABLE IV. PEARSON CORRELATION COEFFICIENT VALUE FOR THE NATIONAL INDEX AND STATISTIC INDICATORS FOR 2015 FOR THE REGIONS RATED IN 2014

	index investment of large and medium	index investment full circle	index of manufacturing industries	index of agricultural production in all categories	index of agricultural organizations
overall rating	-0.05	-0.37	-0.11	-0.35	-0.32
regulatory environment	0.11	-0.11	-0.21	-0.56	-0.57
institutions for business	-0.08	-0.34	-0.07	-0.11	-0.04
resources and infrastructure	0.03	-0.20	-0.26	-0.28	-0.34
small business	-0.02	-0.11	-0.05	-0.28	-0.20

The coefficients of correlation between the National Index and statistic indicators for 2015 for the regions, which were in 2014 rating (in order to test the hypothesis about a delayed impact of the National Index on the statistic indicators), also demonstrate that there is a weak correlation between the indicators. What stands out is that out of 30 correlation coefficients only 5 are positive [7].

The National Index for 2016 is shown without breaking down the final rating into separate indicators as previous years. The authors studied the indicators for the first half year 2016, as there were no annual data at the time of writing. The correlation coefficients are also insignificant like in previous cases [4].

TABLE V. PEARSON CORRELATION COEFFICIENT VALUE FOR THE NATIONAL INDEX INDICATORS FOR 2016 AND THE STATISTIC INDICATORS FOR THE FIRST HALF YEAR 2016.

	index investment of large and medium	index investment full circle	index of manufacturing industries	increase in the number of small businesses
2016	-0.01	0.00	-0.20	0.17
2015	0.16	0.08	-0.30	0.21
2015-2016	0.22	0.10	-0.25	0.15

Also the level of correlation between the National Index position in 2016 and the statistic indicators for 2015 were studied separately (in order to check the hypothesis that there is relation between the National Index position and indicators

of the social and economic development of the region for the previous year) [8]. Here again, the correlation is weak (table VI).

TABLE VI. PEARSON CORRELATION COEFFICIENT VALUE FOR THE NATIONAL INDEX INDICATORS FOR 2016 AND STATISTICAL INDICATORS FOR 2015.

	index investment of large and medium	index investment full circle	index of manufacturing industries	increase in the number of small businesses
2016	0.18	0.03	0.23	-0.16
2015	0.24	0.00	-0.01	-0.14
2015-2016	0.19	-0.01	-0.18	-0.07

IV. DISCUSSION

The measures of the National business initiative are aimed at the region business development that should be reflected in the state statistic indicators. From a theoretical perspective, if entrepreneurs are satisfied with the situation, there are no impediments to business; there are perfect conditions for

infrastructure construction. Then industrial and agricultural production will develop, investments will increase, therefore the indexes will get higher too. Though as the result of the study, the authors have found out that there is no linear correlation between the key statistic indicators and the region position in the National Index. In other words, a region may

have a high position in the National index, but low social and economic development indicators.

The results can be explained by the following reasons [3]:

1) The statistic indicators under study do not reflect the efforts made. And the efforts made to achieve other goal (the National Index position) do not influence the social and economic development indicators.

2) The relation between the studied indicators is nonlinear.

3) The correlation between the studied indicators exists, but with some time lag (positive or negative).

4) The National Index is compiled with the help of experts opinion. But the sample of experts can be unrepresentative. That is the experts who see the changes within the National business initiative do not have any impact on the statistic indicators.

5) The quality of the correlation can reduce because of the region being estimated only in one category.

The National business initiative provide conditions for micro and small businesses first. At the same time, large and medium enterprises are more convenient to keep recording of (the report more often; accounting is more accurate), that allows one to get a quicker and more accurate feedback to the introduced reforms. Besides, a large enterprise has a larger market share, and a positive impact on one large enterprise (instead of 100 small ones) can show up positively in a noticeable share [6].

As the history of the entrepreneurship development shows, the present share of small business in Europe is the result of evolutionary enterprise consolidation (craftsmen into craft guilds, cooperatives, holdings, etc.), which demonstrates a higher efficiency of large enterprises than that of small enterprises. The present share of small enterprises in Russia has formed as a result of artificial split of large enterprises and industry sectors, founded during the period of so-called Stalin industrialization.

Together with small business development, artificial competition was introduced. The consumers market is not growing; this results in the growth of inefficient enterprises. So the capacity of the consumer market is distributed among a greater number of enterprises.

V. CONCLUSION

The way of estimating the business environment situation with the help of the system of indicators fits well into the global system of social and economic development. The indicators are trustworthy marks for economic entities, regional and federal authorities. Establishing a balanced system of indicators assists an increase in tax revenues to the budget of all levels as a result of the development of the entrepreneurship of all kinds, shadow market reduction, growth in business activity.

However, one has to take into account that at a regional level, when making plans of the region development, they look to the statistic indicators of the social and economic development, not to entrepreneurs' satisfaction indicators as the goals.

It is necessary to coordinate the vectors of regional authorities' efforts aimed at achieving results in certain ratings with the general vector of the region development.

The further study should analyze the cause and effect relationship between business environment and authorities measures, financial and organizational support, which will provide an increase in production output (both industrial and agricultural), and therefore have a positive impact on the social and economic development of the region.

It is necessary to continue search for the parameters of correlation between the National rating and statistic indicators, but there is a risk to get a favorable result, not reflecting the existing relation.

Considering the above-noted drawbacks of the government support of small businesses, it is necessary to focus efforts on the small and medium business development, providing conditions for developing.

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