

WHERE TO INVEST YOUR MONEY?

SIBERIA!

TOPICALITY

Russia has a Federal structure of polity, so the balanced development of each region is important to improve the country's position in the world market.

PROBLEM: the increase of investment attractiveness of the Siberian regions.

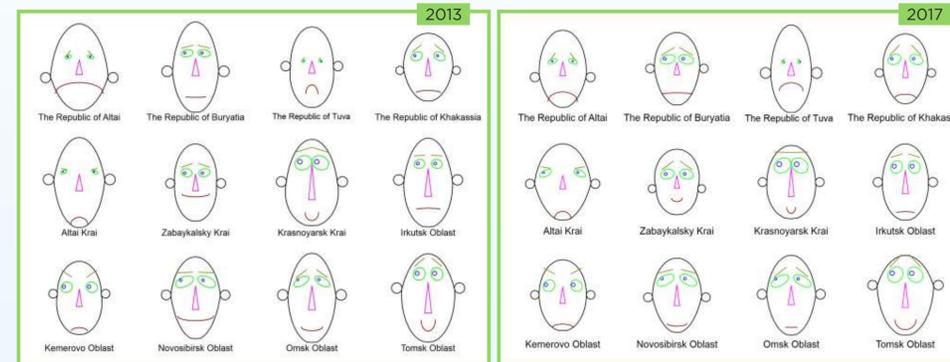
SUPPOSITION: the verification of the existence of regions with high investment potential and low investment risks in Siberia.

PURPOSE: The purpose of the research is the statistical evaluation of investment attractiveness of the regions of the Siberian Federal district (SFD) and identification of factors leading to its decline in 2013 and 2017.

SOURCES OF STATISTICS: The Russian Federal State Statistics Service (Rosstat), Unified Interdepartmental Information and Statistical System (UISS).

METHODS: method of visualization of multivariate data - Chernoff's face, method of portfolio analysis on the basis of the modified GE/McKinsey matrix, statistical tables.

ANALYSIS OF SIBERIAN REGIONS INVESTMENT ATTRACTIVENESS WITH DIFFERENT METHODS



Picture 2. Display of investment appeal of regions of SFD parameters for 2013 and 2017 years with graph «Chernoff faces»

The Chernoff faces graph is one of the icons that display multivariate data in a shape of a human face. The individual parts, such as eyes, ears, mouth and nose represent values of the variables by their shape, size, placement and orientation.

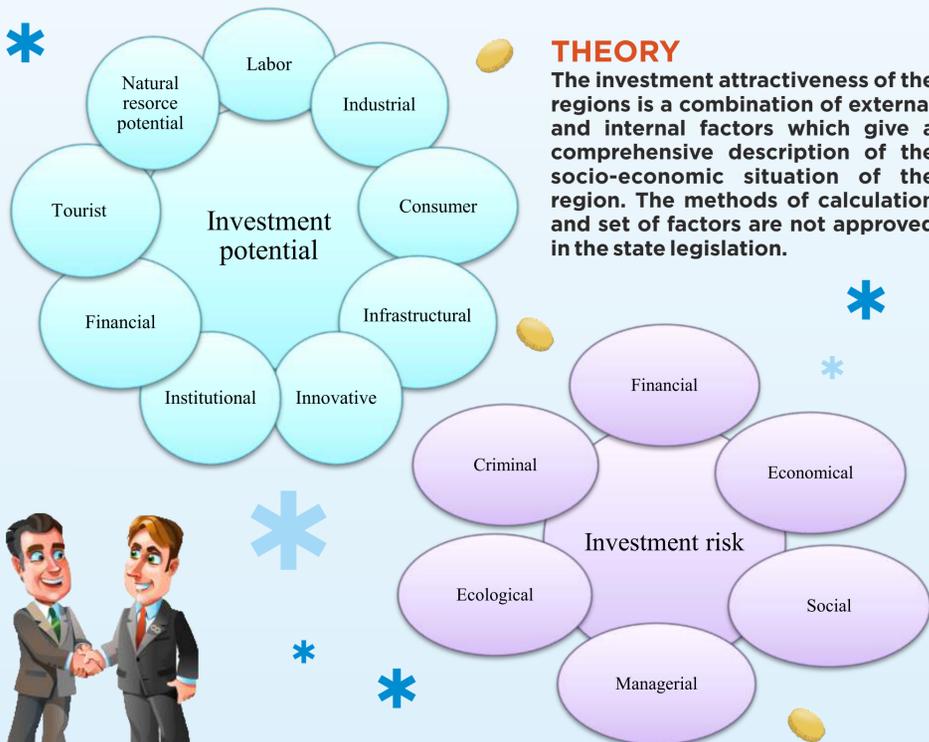
Table 2. Designation of features with statistical indicators of investment attractiveness of the regions for «Chernoff faces»

Feature	Statistical indicator
Face width	Percentage of companies performing innovations in total number of companies, %
Ear level	Fixed capital depreciation ratio in the region, %
Half-face height	Share of profitable business in the regions
Eccentricity of upper face	Share of unprofitable business in the regions
Eccentricity of upper face	Fixed capital investment per company in the region, million rub
Length of nose	Per capita Gross Regional Product, rub
Position of center of mouth	Share of small business in the region
Curvature of mouth	Percentage of people with an income below subsistence level in the region, %
Length of mouth	Percentage of people confiding the government, %
Height of center eyes	Output of specialist from municipal and state higher education institutions, person per 1000 of the population
Separation of eyes	Density motorway with hard surface, km per 1000 km ² of territory of the region
Slant of eyes	Number of crimes, unit per 1000 of the population
Eccentricity of eyes	Share of gross value added (GVA) for mining operations in total GVA of region
Half-length of eye	Average per capita income of the population of the region, rub
Position of pupils	Share of population of labor age in total population of region
Height of eyebrows	Extent of pollution of ambient air from stationary sources, ton per km ² of territory of the region
Angle of eyebrows	Number of health resorts in the regions

The indicators of the four regions of the Siberian Federal district have significantly changed. It contributed to their transition from one type to another. Two regions has improved their positions and two ones has deteriorated their positions (table 3).

Table 3. Characteristics of regions of SFD position in 2013 and 2017 years on matrix «Investment potential - Investment risk»

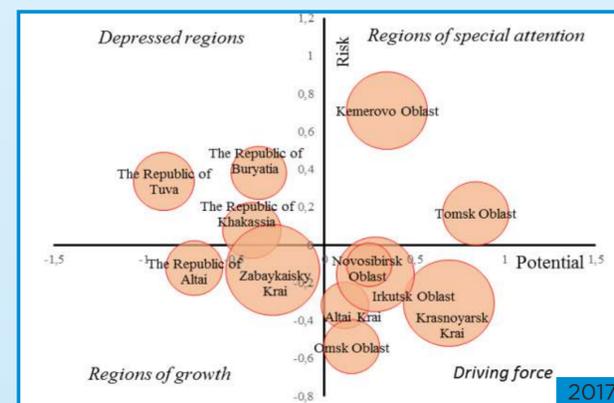
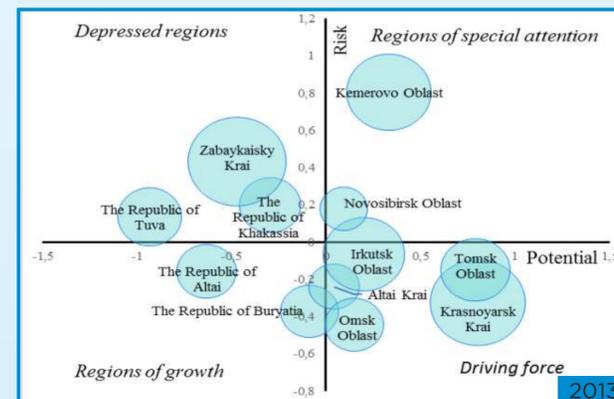
Region	Type in 2013	Type in 2017	Trend	Changes of factor of investment risk	Changes of factor of investment potential
Novosibirsk Oblast	Regions of special attention	Driving force	positive	Decrease of the number of crimes per 1000 of the population	Increase of per capita Gross Regional Product and share of small business in the region
Zabaykalsky Krai	Depressed regions	Regions of growth	positive	Decrease of the number of crimes per 1000 of the population	Increase of share of small business in the region and fixed capital investment per company in the region
Tomsk Oblast	Driving force	Regions of special attention	negative	Increase of fixed capital depreciation ratio in the region and percentage of people with an income below subsistence level in the region	Decrease of the number of health resorts in the regions and output of specialist from municipal and state higher education institutions per 1000 of the population
The Republic of Buryatia	Regions of growth	Depressed regions	negative	Increase of fixed capital depreciation ratio in the region and share of unprofitable business in the regions	Decrease of the number of health resorts in the regions and output of specialist from municipal and state higher education institutions per 1000 of the population



THEORY

The investment attractiveness of the regions is a combination of external and internal factors which give a comprehensive description of the socio-economic situation of the region. The methods of calculation and set of factors are not approved in the state legislation.

According to the faces, an assumption about the level of investment attractiveness of the region can be made. Krasnoyarsk Oblast, Tomsk Oblast are attractive for investment because they are visualized by kind and smiling faces in 2013 and 2017. At the same time the faces of the Republic of Tuva, the Republic of Altai, the Republic of Tuva, Kemerovo Oblast have sad faces with drooping eyes, which indicates the low investment attractiveness of the regions. The facial expressions of the Republic of Buryatia and Zabaykalsky Krai have changed so the investment attractiveness of these regions in 2017 compared to 2013 has also changed.



Picture 3. The matrix «Investment potential - Investment risk» for regions of the Siberian Federal District (SFD) for 2013 and 2017 years



The modified GE/McKinsey matrix is constructed on the basis of integral indicators using a multidimensional mean. The matrices of portfolio analysis "Investment potential - investment risks of the region" for the Siberian Federal district for 2013 and 2017 allow to distinguish 4 types of investment attractiveness of the regions:

- high investment potential - low investment risks («Driving force»);
- high investment potential - high investment risks («Regions of special attention»);
- low investment potential - low investment risks («Regions of growth»);
- low investment potential - high investment risks («Depressed regions»).

On the matrix the radius of the circles reflect fixed capital investment per company in the region.

CONCLUSION

1. In 2017, 42% of Siberian regions (Altai Krai, Krasnoyarsk Krai, Irkutsk, Novosibirsk Oblast and Omsk Oblast) have a high investment attractiveness due to their high investment potential and low investment risks; 25% of the regions (the Republic of Buryatia, Tyva and Khakassia) have a low investment appeal, as they are characterized by high investment risk and low investment potential; during the research some territories were highlighted as growth regions because of their need to increase investment potential - the Zabaykalsky Krai and the Altai Republic, and as regions of special attention, where measures have to be taken to reduce investment risks - the Kemerovo Oblast and Tomsk Oblast.
2. The regional structure of investment attractiveness of Siberia has not changed markedly during the analyzed period from 2013 to 2017 - the position of the two regions has improved and two has deteriorated.
3. In the Novosibirsk Oblast and the Zabaykalsky Krai, investment attractiveness has improved mainly due to an increase in the per capita GRP and the share of a small business, as well as a decrease of the number of crimes per 10,000 people during the analyzed period.
4. The investment attractiveness of Tomsk Oblast and the Republic of Buryatia were deteriorated along of an increase in fixed capital depreciation ratio, the share of unprofitable companies, percentage of people with an income below subsistence level in the region, also affected the decrease of the number of health resorts and the output of specialists from municipal and state higher education institutions per 1000 population for the analyzed period.
5. For the analyzed period the depressed regions of Siberia are characterized by high social, financial risks and the low labor, production and innovation potential.

SYSTEM OF STATISTICAL INDICATORS

Each group of factors, shown in picture 1, is characterized by one or two statistical indicators.

Table 1. Authors system of statistical indicators characterizing investment appeal of regions

Characteristic	Statistical indicator, unit of measure
Investment potential	1 Share of gross value added (GVA) for mining operations in total GVA of region
	2 Share of population of labor age in total population of region
	3 Output of specialist from municipal and state higher education institutions, person per 1000 of the population
	4 Per capita Gross Regional Product, rub
	5 Fixed capital investment per company in the region, million rub
	6 Average per capita income of the population of the region, rub
	7 Density motorway with hard surface, km per 1000 km ² of territory of the region
	8 Percentage of companies performing innovations in total number of companies, %
	9 Share of small business in the region
	10 Share of profitable business in the regions
	11 Number of health resorts in the regions
Investment risk	1 Fixed capital depreciation ratio in the region, %
	2 Percentage of people with an income below subsistence level in the region, %
	3 Share of unprofitable business in the regions
	4 Percentage of people confiding the government, %
	5 Extent of pollution of ambient air from stationary sources, ton per km ² of territory of the region
6 Number of crimes, unit per 1000 of the population	

