DEVELOPMENT TYPOLGY OF REGIONS FOR THE PURPOSES OF THE INVESTMENT POLICY OF USING SAS BUSINESS INTELLIGENCE

The study a large number of factors that influence the development of investment in agricultural production by means of data mining, which make up the SAS Business Intelligence, was chosen the most significant, and formed the group of a certain typology, according to which the features suggested improvement of investment policy.

Key words: investments typology, investment policy, agro-industry, investment attractiveness, analysis, SAS Business Intelligence.

How to optimize the use of domestic investment resources is especially important for the Ukrainian economy, which is a long time remains unattractive to foreign investors. According to data of the World Bank and the International Finance Corporation «Doing Business 2013» [1] at rating «Doing Business 2013» Ukraine rank is 134th only. The solution to this problem is closely connected with the need to develop ways to improve of investment policy that at a dynamically changing situation and increasing of the openness of the national economy requires a detailed analysis of all the factors that form conditions of investment activity both on macro-and meso-levels.

The question of the development of the investment activity in branches and sectors of the national and regional economy are devoted in works of foreign and domestic scientists, including Denisenko M., Gutkevych S., Hudzynsky O., Keynes J., Kisil M., Kondratiev N., Porter M., Schumpeter Y., Zubets M. and others.

Much attention focused on the need for adaptation of state regional policy and in particular, on its investment component according to features of the economy of certain regions. Those questions are described in the works Ackerman E., Andreychuk V., Chumachenko M., Matvienko R., Onishchenko V. and others. However, the problem of purposeful and differentiated use of the investment potential of the national economy based on regional features paid to little attention.

The aim of the article is substantiation of necessity mapping of regional features specific to agro-industrial production in the state investment policy.

During the research was supplied the following purposes: study the existing methods for classification and typology of regions for the purposes of investment policies, to identify the most significant factors for the purposes of investment policy, develop
an appropriate typology for the regions of Ukraine, taking into account the priority
development of the agro-industrial production.

Integration to the European Economic Area puts new requirements to ensure the
competitiveness of the national economy. Under these conditions the question of its
innovation and investment maintenance arises more acutely.

The economics of regions of Ukraine [2, p. 140] characterized by different levels of
investment attractiveness, competitiveness, climatic conditions, economic development
and social standards, but also it have common, integrating elements especially in agro-
industry. As the experience of regions, whose economy is dominated by agricultural
production for their sustainable economic development, is important not only to increase
the volume of investment involved, but they also must be directed to the leading
branches of the regional economy in optimal proportions according with the optimal
branch structure, production and resource potential of regions.

This investment policy allows detecting and adjusts the negative structural changes in
the regional economy, helps to eliminate disparities in their sectorial structure, identifies
trends further disintegration and differentiation of socio-economic development. The
complexity of solving these problems is in the necessity analyze large volumes of
information, in the identification of most significant and typical factors, common and
distinctive features and characteristics, modeling perspectives of development of the
investment activity in the regions. None of this is unpassable without the use of data
mining tools, as powerful as the software SAS Business Intelligence [3].

Typical examples of classification of regions are proposed by M. Homenyuk [4, p. 43]
and V. Zakharchenko [5, p. 53]. In their works were described the grouping attributes
characterizing the structure of the regional economy and its openness, in particular, used
the share of industry in GRP, share of exports to the GRP and index of the share of
innovative products in total volume of industrial production at the region.

In general, classification and typology of regions use a wide range of features to
grouping, depending on their goals, as example, share gross regional product per capita,
sectoral structure of the economy, geographic location, income, demographic situation
in the region, the ratio of employment in different sectors of the economy, and so on.
In all, we can count several tens of statistical indicators that characterize these signs.

At the core of the typology proposed by the authors posited the features of
investment providing agricultural production particular region. This is due to the fact
that the agricultural sector — undoubtedly an important component of the economies of
all regions without exception. And his top link — agriculture, long period demonstrates
sustained economic growth, competitiveness and characterized by a significant export
potential. In addition, although the agriculture, which in itself, and is not a significant
source of investment maintenance, it creates preconditions for developing other sectors
of the national economy, forms a synergetic effect from investment activity in agro-
industrial complex.

A result of research carried out on the use of a set of 39 socio-economic indicators
implemented in SAS Business Intelligence (average distance, centroid method, Ward’s
minimum variance, k-means), received the following grouping of regions.
Table 1

Summary results of the cluster analysis of effectiveness of investment activity in the regions of Ukraine in 2010–2012 (developed by the authors based on source [6])

<table>
<thead>
<tr>
<th>Region</th>
<th>Number of the cluster</th>
<th>Distance to the center of the cluster (on average, by different methods)</th>
<th>Group by the level of efficiency investments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Crimea</td>
<td>3</td>
<td>1.69366</td>
<td>very high, increasing</td>
</tr>
<tr>
<td>Dnipropetrovsk</td>
<td>2</td>
<td>2.29593</td>
<td>high and rising</td>
</tr>
<tr>
<td>Donetsk</td>
<td>5</td>
<td>1.56233</td>
<td>very high, increasing</td>
</tr>
<tr>
<td>Zaporizhia</td>
<td>5</td>
<td>1.73793</td>
<td>not high, increasing</td>
</tr>
<tr>
<td>Lugansk</td>
<td>5</td>
<td>1.94660</td>
<td>not high, increasing</td>
</tr>
<tr>
<td>Odessa</td>
<td>3</td>
<td>2.15895</td>
<td>high and rising</td>
</tr>
<tr>
<td>Kharkiv</td>
<td>3</td>
<td>1.47743</td>
<td>very high, increasing</td>
</tr>
<tr>
<td>Ivano-Frankivsk</td>
<td>3</td>
<td>2.08548</td>
<td>not high, falls</td>
</tr>
<tr>
<td>Vinnitsa</td>
<td>1</td>
<td>1.23383</td>
<td>not high, increasing</td>
</tr>
<tr>
<td>Volyn</td>
<td>3</td>
<td>1.71505</td>
<td>not high, falls</td>
</tr>
<tr>
<td>Zhytomyr</td>
<td>4</td>
<td>1.48645</td>
<td>not high, falls</td>
</tr>
<tr>
<td>Transcarpathian</td>
<td>3</td>
<td>3.27512</td>
<td>not high, falls</td>
</tr>
<tr>
<td>Kirovograd</td>
<td>1</td>
<td>1.31494</td>
<td>not high, increasing</td>
</tr>
<tr>
<td>Kiev</td>
<td>2</td>
<td>2.29593</td>
<td>very high, increasing</td>
</tr>
<tr>
<td>Lviv</td>
<td>3</td>
<td>1.49399</td>
<td>high and rising</td>
</tr>
<tr>
<td>Nicholas</td>
<td>3</td>
<td>2.29645</td>
<td>not high, falls</td>
</tr>
<tr>
<td>Poltava</td>
<td>5</td>
<td>2.18412</td>
<td>not high, increasing</td>
</tr>
<tr>
<td>Rivne</td>
<td>4</td>
<td>2.01886</td>
<td>not high, falls</td>
</tr>
<tr>
<td>Sums</td>
<td>4</td>
<td>0.65913</td>
<td>not high, falls</td>
</tr>
<tr>
<td>Ternopil</td>
<td>4</td>
<td>1.81193</td>
<td>not high, increasing</td>
</tr>
<tr>
<td>Kherson</td>
<td>1</td>
<td>1.31776</td>
<td>not high, falls</td>
</tr>
<tr>
<td>Khmelnytsky</td>
<td>4</td>
<td>1.83218</td>
<td>not high, falls</td>
</tr>
<tr>
<td>Cherkasy</td>
<td>1</td>
<td>2.13486</td>
<td>not high, increasing</td>
</tr>
<tr>
<td>Chernivtsi</td>
<td>3</td>
<td>2.09909</td>
<td>not high, falls</td>
</tr>
<tr>
<td>Chernihiv</td>
<td>4</td>
<td>1.45575</td>
<td>not high, increasing</td>
</tr>
</tbody>
</table>

Grouping of regions presented in Table 1 practically corresponds to their distribution on macroeconomic and agrotechnical areas.

For the purposes of the research and forecasting of investment activity in the regions and to improve the state investment policy, the authors proposed a typology of regions, which is based on European and Russian approaches [7], adapted to Ukrainian conditions (grouping performed using SAS Business Intelligence).

The feature of the typology presented in Table 2 is that the grouping attributes is not only a production orientation or geographic location, and the complex of factors, primary among which is the sensitivity of the regional economy (especially agro-industrial production) for investment.
### Table 2

<table>
<thead>
<tr>
<th>Name Type</th>
<th>Description regional features typology</th>
<th>Regions that belong to this type</th>
</tr>
</thead>
<tbody>
<tr>
<td>with special status</td>
<td>Cities — the centers of national importance that are centers of adjacent regions</td>
<td>m. Kyiv, Sevastopol, Crimea</td>
</tr>
</tbody>
</table>
| traditionally developed, active investment | - gross regional product of the region is more than 75% of the national average among regions;  
- Positive trend of investment income;  
- stable investment attractiveness;  
- presence of the existing branch structure;  
- powerful scientific potential. | Dnipropetrovsk, Donetsk, Zaporozhye, Lugansk, Poltava, Kiev, Kharkov, Odessa regions |
| active investment, such the developing | - gross regional product of the region is in the range of 50% to 75% average across regions or became positive growth;  
— balanced industrial structure;  
- existing stable positive dynamics of development;  
- investment is increasing, but there is no strong positive the dynamics;  
- not high investment attractiveness;  
- low level of implementation of innovations | Nikolaev, Vinnitsa, Cherkassy, Kirovograd, Kherson regions |
| regions that are potential consumers of investment | - gross regional product of the region is less than 50% on average among the regions;  
- investment dynamics negative or was not determined;  
- investment unattractive;  
- branch structure needs improvement. | Zhytomyr, Ternopil, Chernihiv, Sumy, Rivne, Khmelnitsky regions |
| areas of cross-border cooperation | - regions bordering with countries outside the CIS, their separate areas have a special status | Volyn, Lviv, Ivano-Frankivsk, Transcarpathian and Chernivtsi regions |

Developing measures for improvement of public investment policy according to the present typology of regions, government should pay attention to the features of investment that is specific to different groups and take into account them while developing regional investment programs and strategies.

Group of investment active leading regions consists of regions with industrial-oriented economy, which shows non-clear positive trend, but differs of investment attractiveness and a significant amount of investment. Agriculture in these regions focused on providing needs of the population for food, although industry specialization is highly effective. Therefore, the investment policy in these regions should be oriented first of all on development of leading industry branches and tasks, and for the agricultural sector priorities consist in food self-sufficiency of region.
The economy of the regions that identified as potential consumers investments is characterized by non-always positive economic development, low investment attractiveness and efficiency of investment. Therefore, the main objective of the investment policy for this group of regions should be to support those investment directions that contributing to the formation of optimal branch structure of the economy in these regions (including agro-production).

The largest group is the group of investment typology that consists of investment active regions whose economies are growing. Members of this group — regions, economy of which is based on the agricultural production, they have low ratings of attractiveness. That is why they must use mainly their own investment resources for further development. Nevertheless, over the past five years they have shown steady positive economic dynamics.

This group includes leading regions of agricultural production, for which agriculture is the leading system-branch of the economy. In regions-members of this group, enterprises of other sectors of agro-production, in particular, trade and transport develop around of agricultural enterprises. A characteristic feature of those economic systems is balanced industrial structure, developed agro-industry with a clear trend of cooperation and clustering. This group of regions requires special attention from the state and local government, since a synergistic effect on investment received in the integrated agro-formations significantly increases the overall efficiency of investment.

Regions of cross-border cooperation highlighted in a separate group due to the peculiarities of the functioning of those economic systems through participation in interstate projects and therefore have the appropriate legal status of the investment maintenance. To further modeling and ensuring clarity of the results, we have developed an interactive map of the region using tools SAS Business Intelligence and the results of previous studies [8]
Using of this map will greatly facilitate the perception of information about classification regions on the particular groups, will help simulate the process of co-development of geographically close and remote regions, and more.

Thus, according to the study, agriculture is the basis for the formation of an effective system of investment activity. It is therefore necessary not only try to attract more investment of resources, but also to optimize the activity of the regional and state administration to ensure a balanced orientation of investment resources in the economy of certain regions.

Given the significant impact of regional characteristics on the effectiveness of investment in agricultural production should be differentiated approaches to stimulate positive development of investment activity in agricultural production according to the typology developed by the authors. In order to improve the quality of research should be more use tools SAS Business Intelligence, competent application which will reduce the risks associated with management decisions.


The article is recommended to be published in the present state by the following scientists:

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