

About optimization of regional investment resources

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Abstract: Changing dynamics of the Russian economy, use of reproductive mechanisms to accelerate the transition to sixth technological order and ensuring of the modernization course in general sense are impossible without complex implementation of optimal investment and resource transformations at the level of the Federation members. Meanwhile one of the most important aspects of these transformations in national and regional perspectives is a structural one that implies the reasonable definition of promising types of economic activity for the purpose of the efficient dispersal of financial investments.

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1. Introduction

Implementation of innovative processes in the country, dynamics acceleration in different sectors of economy, modernization of public institutions and research infrastructure, ensuring of security and integrity of the state would be impossible without the realization of significant projects. But on the path of the funding rounds implementation often arise legal obstacles as well as those of organization and control nature, which do not allow the proper use of existing innovative potential.

The role of investment is very laconically treated by V. Ivanter. According to his findings, investments form the "space" of economic growth, define the extension of demand for equipment, building and construction works and, what is most important, for innovation. Due to the renewal and increase of production capacity, the structural and technological modernization of production and the ramp-up of its volume are implemented. Thus, investments, creating the final and intermediate demand for the products of industries of the national economy, determine the material conditions for the efficient development (Ivanter, 2012).

At the same time it is necessary to admit that even in special studies no definitive interpretations are provided in relation to the investment processes of the last decade in Russia. Controversial assessments, presence of diametrically opposite opinions about the nature of reproduction of capital indicate the presence of objective difficulties in analyzing and forecasting that are insuperable within traditional approaches (Budanov, 2012).

According to A. Zeldner's researches, under conditions of limited resources, management of the balanced economic development is always the optimal choice of priorities that ensure the planned eventual result - economic growth and social stability. The

functional role of the investment process within the priority development strategy and the public reproduction structure consist in the conversion of additional capital to the upgrade and improvement of basic production factors (Zeldner, 2012).

S. Glazyev adheres to the farsighted enough position concerning the investments to foreign states, and, in particular, to offshore territories. According to him, the result of the capital export out of the country will be a substantial deterioration of the Russian ruling elite position, both because of the growth of social tension due to the fall in living standards, and as a result of the global monitoring and expropriation of a significant part of the capital accumulated in the offshore zones for "doubtful" operations (Glazyev, 2013).

The rate of Russian accumulation (investment-GDP ratio) remains low - about 18%. In postwar Europe up to the 1970s the rate of accumulation was not less than 25 %, in Japan – 30 %, during the period of Soviet industrialization it reached 33 - 35 %. Fast-developing China supports the rate of fixed capital accumulation at 38 % level of GDP. For Russian national economy the low level of investment to fixed capital means nowadays the conservation of structural and technological degradation (Kuchukov, 2013). S. Glazyev notes that in order to "stay on top" of the new "wave" current phase of economic growth, investments to the production of new technological system should be doubled every year (Glazyev, 2013).

Examination of "gold" targets for the rate of investment accumulation rises to the question of how to select the investment structure to certain sectors of activity. All sectors without exception tend to be through (to change) specific types in life cycle: from the implementation and growth to stagnation.

Within this issue we should mention that the types of economic activity can be divided into three

major groups according to the turnover dynamics:

- “modern” economic types-leaders, the part of which increases in the economy measured according to any conventional index (sales volumes, profit). At the turn of the century, they primarily include biotechnologies and telecommunications;

- “old” economic types, the part of which steadily decreases. Among there are many “polluting” ones, such as, for example, the production of non-ferrous metals, rubber and plastic products, etc. In developed countries, these industries are being curtailed up to the complete liquidation of production;

- other types, that are between these two poles. The dynamics of their development has not so obvious autonomous trends.

With the information about the examined patterns it becomes much easier to foresee future changes and thereby to reduce the level of risk. Naturally, the most efficient and the least risky investments are those associated with the financing of innovative ways of management characterized by high growth rate (Fedosova, 2013).

It should be emphasized that the high efficiency of investment resources is only possible in case of the priority development of knowledge intensive industries with financial support of R&D by both state and private business.

At the same time, resources, knowledge, experience, intellectual capital with a high rate of institutional changes and their crudity, logical weakness (when there is no reasonability or logic, target adequacy) dwindle as factors of production and competitive rivalry and lose their value.

On the other hand, the socio-economic benefits are received by those regional systems that mobilize properly and as fast as possible natural, scientific, educational, industrial, technological, material and financial and other resources, that in its turn allows implementing the complex of measures for activation and expanded reproduction of innovation activities.

As a result, we can not but agree with V.K. Senchagov, according to the opinion of whose the main link of the strategic plan in the country should become the structural modernization of high-tech industries, as well as some traditional fields, serving human daily needs. At the same time, in modern computer centers there is an opportunity not only to assess the current socio-economic situation, internal and external needs of the state, but also to calculate the long-term risks for the implementation of national interests of the Russian Federation (Senchagov, 2013).

2. Methods

Problems outlined above, as well as milestones cause a need for the development of techniques

allowing to make the correct comparison of the dynamics of economic development in various management sectors throughout the regions, districts and the country.

In order to optimize innovation and investment measures in socio-economic development of the region Pareto's law is suggested to be used, according to which 20 % of efforts give 80 % of the result, and the remaining 80 % of the effort give only 20 % of the result (Il'enkova, 2006). In 1897 Vilfredo Pareto formulated the principle of "incorrect distribution of wealth in society" devising logarithmic mathematical models describing this inhomogeneous distribution.

Pareto's law is applicable to many situations and in most cases is respected in everyday life. Pareto's analysis ranks separate fields and phenomena according to the significance or importance, and calls to identify and primarily eliminate those reasons that cause the greatest number of problems (disparities). But we should take into account that in these statements fundamental ones are not the mentioned numerical ratios, but the fact of imbalance itself and their significant difference.

Meanwhile, the ratio 20/80, that is not absolute or invariable, is often transformed to 15/85 or to 30/70. Moreover, the amount of values included to the ratio should is not necessarily equal to 100 percent and can take the form of 10/70 or 50/95.

It is important that the number of positions (factors) were large enough. The popularity of Pareto's law is determined, on the one hand, by its extreme simplicity and the visibility, and on the other hand - the possibility to use a very wide range of processes in the analysis. The ABC-analysis is based on the principle of imbalance according to the results of which factors are ranked in 3 categories depending on the amount of their contribution for the cumulative effect.

The most important tasks (category A) form about 15 % of the total number of tasks and phenomena. However, the significance of these tasks (in terms of contribution to the goal achievement) amounts to about 65 %. Important tasks (category B) has an average of 20% of the total number of tasks and 20 % of significance; less important and unimportant tasks have respectively 65 % and 15 % (see Fig. 1).

3. Results

As a working hypothesis we can put forward the assumption that this pattern also applies to the socio-economic indices of the region. In this study, Vladimir region is selected as an object. According to the official data of Federal State Statistics Service of the Russian Federation on sectoral structure of gross value added found that for 20 % of economic sectors of

the region (3 of 15 activity categories) 54.5 % of the GRP is accounted (Regions, 2013). These proportions for the past few years have not radically changed. The most capacious sector of Vladimir region is the processing industry (31 %). Meanwhile, we should mention that in terms of this index the region is one of the leaders in the Central Federal Region (hereinafter –

the CFR). Larger proportion of industry in gross value added in Central Russia have only Kaluga (38.2%), Lipetsk (39.2 %) and Tula (35.3 %) regions. In its turn, the calculations detalization allows to affirm that 4 of 15 activity categories (26.7%) in the structure of processing sectors of Vladimir region accounts for 60.1 % of production (Fig. 2).

Relative significance of tasks (rate of contribution to the goal achievement)		
65%		15%
20%		15%
Category A tasks		Category C tasks
15%	20%	65%
Proportion in total amount of tasks		

Figure 1. ABC analysis: distribution of the relative rate of number and significance of different categories of tasks

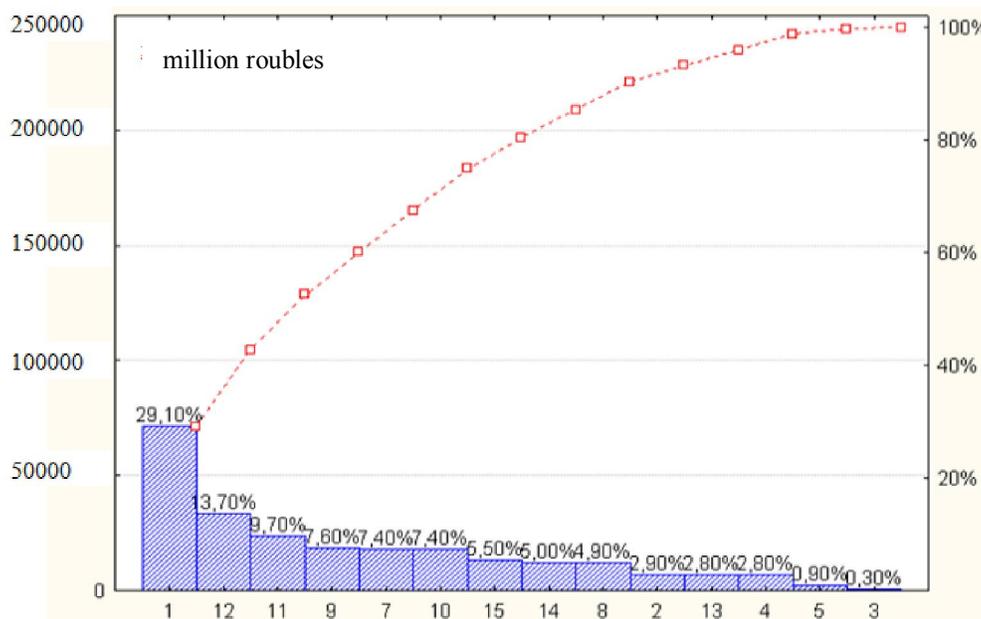


Figure 2. Pareto's map in terms of processing industries turnover for Vladimir region in 2012:

1 - food production, including beverages and tobacco; 2 - textile and clothing production; 3 - production of leather, leather products and footwear; 4 - wood processing and production of wood articles; 5 - pulp and paper production, publishing and printing industry; 6 - coke and oil production; 7 - chemical industry; 8 - manufacture of rubber and plastic products; 9 - manufacture of other non-metallic mineral products; 10 - metallurgical production and manufacture of fabricated metal products; 11 - machinery and equipment production; 12 - manufacture of electrical and optical equipment; 13 - manufacture of transport equipment; 14 – other production; 15 – production of other materials and substances, not included in other groups.

As we can see from Pareto's map built in software package *Statistica 6.1*, the dominant types of processing industry in the region are food production (encoded in figure under number 1) , manufacture of electrical equipment (12), machinery and equipment production (11), manufacture of other non-metallic mineral

products (9). Therefore the defining task is the development optimization of these particular sectors of economy in the region.

To analyze the reaction of economic activity categories according to the realized classification to the changing dynamics of the basic value we suggest using

the pace of growth ratio which may be presented as indices of development and evaluated according to the formula for the base index calculation (Efimova, 2007):

$$DI_i = \frac{T_{n,j}}{T_{r,i}},$$

where DI - Development Index; i - number of analyzed index level (1 - internal, 2 - external, 3 - absolute indices); $T_{n,j}$ - growth rate of the n -th kind of economic activity category according to the classification list in the j -th region; $T_{b,i}$ - growth rate of the base value (with $i = 1$ - of the economic activity category "processing production" in the j -th region to which the n -th activity category refers according to the list, with $i = 2$ - n -th economic activity category according to the classification list in the appropriate federal district, with $i = 3$ - n -th economic activity category according to the classification list in the country).

The application of the above-mentioned

modernized criteria is dictated by the fact that the ratio of the growth rate, in contrast, for example, to the industry elasticity index (which is calculated by the ratio of the rate of increase), will be the only positive value, and operating indices with "minus" sign often causes difficulties. In addition, the information content of the selected index increases: if the obtained result is less than 1, the development of economic activity category falls behind the basic growth trends according to the classification list, if it is equal to or bigger than 1 - it matches or is even ahead the dynamics of selected comparative factors.

According to Pareto's chart (Fig. 2) sectors of management (economic activity categories that make up the largest proportion in the aggregate amount of processing industries in Vladimir region) are determined. Table 1 shows the calculation of the growth rate of these industries by regions of the CFR and in general in the Russian Federation, in 2012 to 2011.

Table 1. The growth rate of the processing industries by region of the CFR and the Russian Federation, 2012 to 2011

Region	Processing industry of everything	Including			
		Food, beverages and tobacco production	Manufacture of other non-metallic mineral products	Machinery and equipment production	Manufacture of electrical and optical equipment
The Russian Federation	1,101	1,108	1,125	1,060	1,120
The Central Federal Region	1,102	1,113	1,044	1,009	1,088
Belgorod	1,109	1,217	1,249	0,894	1,016
Briansk	1,196	1,088	1,446	1,033	1,122
Vladimir	1,101	1,082	1,131	1,101	1,026
Voronezh	1,095	1,120	0,954	1,108	1,141
Ivanovo	1,121	1,148	1,207	1,091	1,121
Kaluga	1,180	1,023	1,180	0,972	1,068
Kostroma	1,180	1,041	1,023	1,005	1,180
Kursk	1,103	1,239	1,141	0,937	1,090
Lipetsk	1,076	1,113	1,159	1,125	1,076
Moscow region	1,073	1,155	1,133	0,981	1,108
Orel	1,066	1,135	1,177	1,030	0,784
Ryazan	1,172	1,110	1,297	1,269	1,020
Smolensk	1,062	1,062	1,277	0,910	1,130
Tambov	1,035	0,922	1,107	1,265	1,131
Tver	1,160	1,034	1,160	1,002	1,502
Tula	1,061	1,089	1,698	0,989	0,996
Yaroslavl	1,145	1,116	1,065	1,145	1,122
Moscow city	1,104	1,039	0,610	0,936	1,117

Compiled according to the: www.gks.ru

According to the formula (1) as an example we suggest settling internal, external and absolute indices of development in dynamics from 2005 to 2012 for leading processing industries in Vladimir region.

According to the data in Table 1 and in Table 2 we show a fragment of calculating for 2012 /2011 of the above-mentioned indices.

Table 2. Development indices of the most significant processing industries in Vladimir region in 2012/2011

Indices	Processing industry of everything in 2012/2011	Including by activity categories			
		Food, beverages and tobacco production	Manufacture of other non-metallic mineral products	Machinery and equipment production	Manufacture of electrical and optical equipment
Internal development indices (DI_1)	1,000	0,983	1,027	1,000	0,932
External development indices (DI_2)	0,999	0,973	1,083	1,091	0,943
Absolute development indices (DI_3)	1,000	0,977	1,005	1,039	0,917

But in order to determine the average rate of development of one or another sector of management in a particular region in the context of three analyzed levels in the whole under the period under review from 2005 to 2012, you can use the formula for calculating the geometric middling (2). The latter traditionally used in evaluating the average growth rate represents the most correct result in content in cases when it is needed to find such a value of economic index that would be qualitatively equidistant both from its maximum and minimum values (Mkhitarian, 2010):

$$\overline{Tr}_{ij} = \sqrt[t]{DI_{s_1ij} \cdot \dots \cdot DI_{s_tij}} \quad (2),$$

where \overline{Tr}_{ij} - average rate of development (geometric middling) of the economic activity category in j -th region of i -th level;

$DI_{s_1ij} \cdot \dots \cdot DI_{s_tij}$ - individual development index values of i -th level for the period under review $S_1 \dots S_t$;

t - number of periods under review S .

In the analyzed situation the calculation was carried out on seven indices of each level (for eight-year period from 2005 to 2012). Therefore, $t=7$. Calculations of average development indices are interpreted in the diagram (Fig.3).

4. Discussions

The carried out analysis makes it possible to establish that two very important activity categories

associated with the production of non-metallic mineral products, and especially of electrical equipment show at once quite problematic dynamics of development. This is evidenced by both internal and external comparisons: in the context of all the mentioned categories, average growth rates are of less than 1. It means a bad situation in fundamentally promising and capacious enough (21.3% of the processing industries) sectors of management, their suboptimal dynamics and the apparent stagnation in the period from 2005 to 2012. For example, the values of the average growth rates of electrical equipment production in Vladimir region in split-level positions analyzed are significantly lower than standard indices (equal to figure one): 0,936; 0,923; 0,924. At the same time machinery building complex and food production of the region show in general an encouraging growth trend.

5. Conclusion

Multilevel calculation of development indices allows to determine the potential of sectoral production, to identify the sectors that are the most promising in terms of industrial growth as well as to establish the economic activity categories, development of which in medium-term period will be the "bottleneck" in terms of achieving high positive dynamics.

However, using these growth opportunities depends on the condition of territorial investment climate, availability of enterprises sufficient financial resources, regional authorities tendency to support the important sectors of the economy..

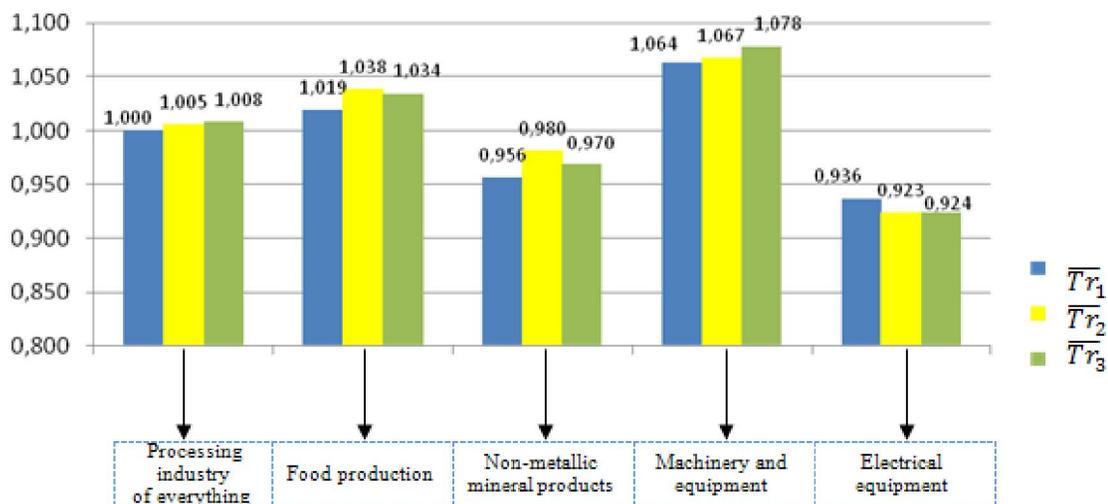


Figure 3. Average development indices of the top priority economic activity categories in Vladimir region, 2005 - 2012

Taking into account that currently the part of inefficient capacity is very high in the Russian Federation, extremely drastic measures are needed for cardinal upgrade of production facilities and rational allocation of investment resources.

The application of the group of sectoral indices considered above can be extended not only to the economic activity categories of the country or of the region, but also on the subspecies or group of products (services), which are of interest from the point of view of identifying the reasonability of investing funds to them.

Returning to the use of Pareto's law and ABC-analysis for the construction of the optimal scheme of investments allocation for the purpose of innovative modernization of the regional economy it seems rational to put forward the assumption that economic activity categories related to the production of other non-metallic mineral products, as well as machinery and equipment, on the one hand, are important and weighty, but on the other hand, they are the most problematic ones. Meanwhile, the structure of investments in processing industries in Vladimir region, according to the authors, should comply with the considered above (Fig. 1) classical ideas about the importance of tasks. Distribution of investment resources in the ratio of 80:20 or 65:35 would be a logical proposal. I.e. the maximum of 80, and at minimum of 65 % of investments in the processing sector should be related to the updating and improving of production capacity producing 1) non-metallic mineral products; 2) electrical equipment. The reason is the obvious lag of these activity categories from the set

internal and external dynamics that is evidenced by the calculated average indices of development. In addition, identified problems of these sectors are a serious obstacle to the development of modernization potential of the region's economy.

The multi-level assessment of the relative dynamics of sectoral development, based on a detailed, sequential analysis, provides an opportunity to identify innovation and investment prospects in order to implement the maximum efficiency of reproduction and resource potential of the regional and national socio-economic systems.

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