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Structural Effects of Regional Reproduction and Supply Chain Strategy in Russia: Impact on Market and Administrative Coordination Relationship

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Abstract-This article is a continuation of a previously published study devoted to the interaction analysis of the national and regional economies through a two-sector model [1]. The concept is based on the proportion between the resource-rich and resource-poor sectors. In the previous article, we showed the fundamental possibility of using this two-sector model for the study of regional economy. In continuation of our study, we will use the two-sector model to study the interrelationships of individual regions using possible situations with different proportions of the resource-rich and resource-poor sectors. Although the two-sector model is initially based on the fundamentally different theoretical grounds, the practical conclusions from this model do not contradict the neoclassical theory of regional development. It is shown how government regulation can help or hinder the development of a separate region, as well as influence the degree of uneven economic development of the regions.

Keywords: two-sector model, structure, resource-rich sector, resource-poor sector, region, market, plan, innovation, investment, Supply chain strategy, Eurasian integration.

1. Introduction

Russia has a high degree of uneven economic development in terms of territory. This unevenness is largely determined by the diverse availability of natural resources, historically established infrastructure, natural and climatic conditions, and other objective factors [1]. Along with objective factors, regional economic policy and business conditions have a significant impact on the development of the subjects of the Russian Federation. Despite the fact that the influence of these factors is not capable of fundamentally reversing the situation in a number of regions, there are examples of how the region has turned from depressive into investment-attractive and has showed high economic indicators due to the actions of the governor and the administration. It is important how effectively the natural or historical advantages are used in the region, or, conversely, to what extent the disadvantage of these advantages is compensated by hidden reserves or original initiatives. All this is reflected in the indicators of economy, budget, social sphere of the regions and determines the high level of differentiation of the subjects of the Russian Federation by socio-economic status. Of course, for the above reasons, a complete similarity is impossible in regional development. The region is an important component of the national economy, with a large internal mobility, is a complex multi-level structure. There is a significant amount of diverse connections, circulation of financial, material and information flows, as well as a combination of economic, social, informational, environmental and other elements in the regions. At present, the key issue is the problems of independence, stable development and economic regions in Russia. The need for a regional study of issues of socio-economic development is associated primarily with the territorial differences, uneven distribution of natural resources, different climatic conditions, and traditions of economic structure. The socio-economic development of a region is always correlated with a certain territory, the availability

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and use of natural resources, etc. The regions, in fact, are in a state of constant competitive struggle for product sales and investment, as well as subsidized assistance from the state In 2017, the Government of the Russian Federation tested a grant mechanism to support regions that are pursuing high economic growth and tax deductions. This includes grants that the federal center sends to the subject for achieving indicators, including on

investment growth. "We will continue this practice in 2018-2020. About 20 billion roubles will be allocated for these purposes annually", said A. Siluanov in an interview. In some regions, these financial investments reach enormous values (Dagestan, Chechnya, Kamchatka), and some regions are unable to provide funding for even the minimum set of their state powers [2].
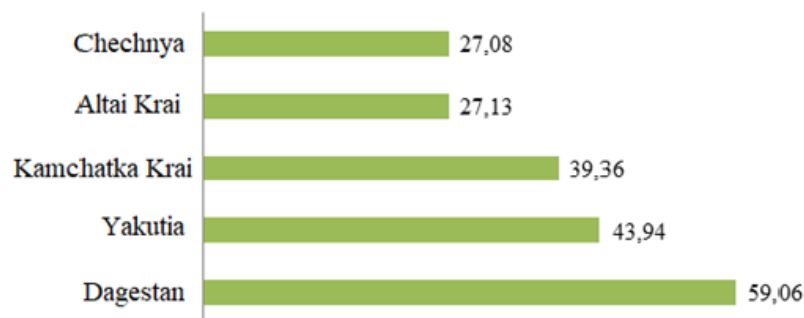

Figure1. Recipients of the largest subsidies from the federal budget. Subsidy amount, billion roubles [4]

These regions are among the highly subsidized areas, where the share of dependence on the federal transfers is maximum: the share of federal subsidies exceeds 40% in the incomes of their budgets. In general, the gap in the budget security of the regions is such that the top five of the most subsidized subjects will receive 30% of all subsidies for leveling in 2018. In our opinion, the role of the authorities is precisely in the study of current situation of the regions, identification of their features, problem and critical situations in their development and, accordingly, development of measures to influence these processes on this basis in the current situation. It is necessary to clearly define strategic priorities, effectively allocate and improve the quality of regional resources and infrastructure, which will create the prerequisites for improving the investment climate, business and well-being of the population together. An objective need arises in the availability of complete information on the reproductive processes of a particular region, its specific features, availability of investment potential (natural resources) and possible weaknesses, such as, for example, harsh climatic conditions. According to the RIA Rating, the richest regions of the Russian Federation in 2018, as well as a year earlier, are as follows: Moscow, St. Petersburg, the Khanty-Mansiysk Autonomous Okrug - Yugra, Tyumen and Moscow Regions, the Republic of Tatarstan, and the position of outsider regions has not almost changed - this is the Republic of Ingushetia, the

Republic of Tyva and the Jewish Autonomous Region. According to the rating, there is a certain regularity in the fact that the security of the region with natural resources is a beneficial advantage and is well known in economics. For example, we refer to the conclusions made by Western economists [3] that the economy's possibilities are not limited in a country with significant natural resources or having the potential to acquire the necessary raw materials. Under these conditions, an objective change in the regional role in the socio-economic development of society takes place. In the framework of this approach, a region is defined as "a part of a country's territory that has a common natural, socio-economic, national-cultural, and other conditions" [5]. Or in another way: "A region is a territory within the administrative boundaries of a subject of the Federation, characterized by: complexity, integrity, specialization and controllability, i.e. the presence of political and administrative authorities" [6]. Initially, the region was not considered as a carrier of special economic interests. Modern theories view the region as a multidimensional and multifunctional system, characterized by some features. The theory of region definition as: quasi-state, quasi-corporation, market, society [7] has become widespread. A region can be regarded as a quasi-state, since it is a relatively separate subsystem of a country and a national economy. "... If a region is singled out as an administrative-territorial entity or economic region, it shall meet the requirements of social development

management or national economic regulation. Every region is characterized by internal economic unity, which is a source of saving social labor" [8]. In many states, the regions collect more and more financial resources and perform functions that have previously belonged to the center. The region as an economic operator interacts and cooperates with transnational corporations. Such cooperation has a significant impact on the development of regions, for example, the placement of branches of such companies provides jobs and places orders, affects pricing and attracts investments. If we consider the region as a society (a set of people living in the same territory), it is necessary to focus on the social side of life, labor resources, health care, education, culture, environment, and conduct research in the context of social groups. This approach is broader than the economic one, since it takes into account educational, cultural, socio-psychological, medical, political and other aspects of life of the regional community. A whole range of diverse theoretical approaches to the issue of regional development is widely discussed and applied in the foreign literature, including the use of regional policy in the EU in practice. This is a set of theories that can be combined into a group of demand-oriented approaches (export balance theory, regional input-output analysis), neoclassical theory of regional development, polarization theory, theory of internal economic indicators, "new economic geography" and a number of others [9]. From the point of view of the main provisions and principles of regional policy, it is necessary to dwell on some of the concepts in more detail.

2.   Theory

The neoclassical theory and model of regional development is based on factors that determine the production potential of a territory with the addition of spatial factors, while the regions are consideredin this model as production units between which interconnection and equilibrium can be established through the markets. The uneven development of regions is explained in these models by a temporary deviation from equilibrium or a consequence of an imperfect adjustment in response to the exogenous shocks. In the long run, such economic and social differences shall be smoothed out and disappear, by achieving capital-labor ratio, equilibrium and mobility of production factors. Jones.The most prominent representatives of the neoclassical direction of regional growth are H.

Ziebert, R. Solow, J. Borts, T. Swan, D. Romer, A. Weil, R. Barro, G. Mankew, H. Sala, D. Martin, R. Hall and Ch. Johns. The theories put forward by them are based on the basic rules for the convergence of regions, interregional trade and interregional mobility of production factors, displacements and distances, balanced growth and conditions of free competition. They included traditional production factor and transport costs, as well as social, political and geographical factors in the regional growth factors. To explain the differences in growth rates at the regional level, they used the studies of differences in growth rates based on production factors at the national level. This measurement method was originally used by J. Borts [10] and was fundamental until the mid 60s. of the twentieth century [11] and continues to be used today. In this approach, the focus is on the quantity and quality of natural and labor resources increasing the productive potential of the region, as well as the level of technology and capital stocks (theory of comparative advantage by D. Ricardo). The economic growth of the regions is ensured and achieved with the help of availability of these factors and interregional capital movement, which will lead to equalization of the level of economic development of the regions by means of their mobility (Heckscher-Olin) and leveling of prices for the production factors (theorem) by Heckscher-Olin-Samuelson.

According to these theories, each region imports goods from other regions that it lacks in production and exports goods outside its borders, the production of which is surplus due to the possession of relatively excessive production factors. Such a movement of goods between the regions equalizes their prices and leads to an equilibrium state of the economy and, as a consequence, to economic growth. In the long term, there is a convergence of regions, and the underdeveloped regions grow at a higher rate than highly developed ones. Thus, the growth of the national economy occurs as a result of effective distribution of the production factors, through the mechanism of the elemental market. Moreover, the production factors are distributed in those regions where they pay more for them. In many neoclassical theories of regional growth, a convergence of interregional differences in economic development is laid through the capital transfer from highly developed regions to less developed ones. As for labor resources, it happens the other way around, they move to highly

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developed ones, where the remuneration level is much higher than in less developed regions. In the absence of factor mobility, the products produced by these factors are actively moving through the interregional trade. Due to the income gained from trade, mobile factors (capital, labor, etc.) necessary for the productive use of immobile factors are attracted to these regions. Thus, it is precisely the interchangeability of interregional trade with the interregional movement of production factors that ensures the growth of economies and the convergence of the levels of economic development of such regions. Neoclassical models make it possible to analyze the regional effects of the direction of movement of goods and services, production factors and degree of capital

accumulation, as well as to identify the degree of influence of production and spatial factors on the growth rates of the regional economies; predict convergence due to the presence of a positive relationship between the growth rate of the economy and the difference between current and equilibrium level of income in the economy; put them into practice.

3.   Model

In the previous article, we described a theoretical two-sector model and showed the fundamental possibility of using this model for the study of regional economy, so we use it to study the interrelations of individual regions. Let's start with the situation presented in Fig. 1.
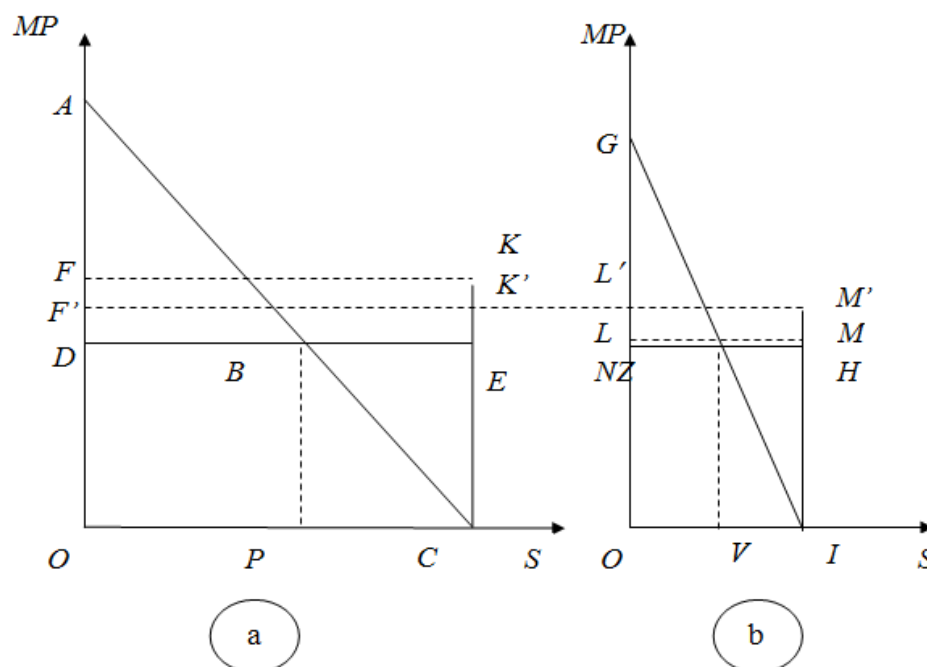

Figure 1. Interaction of profitable and non-profitable regions on a market basis.

In Fig. 1, the national economy consist of two regions, each of which is depicted by means of a separate two-sector model (Fig. 1a and Fig. 1b). Fig. 1a shows the economy of a region in which there is a relatively large resource-rich sector (OABP) and a relatively small resource-poor sector (PBEC). The proportion between these sectors is such that if the region in Fig. 1a exchanged products only with itself, then the revenue of all economic entities in this region would be the OFKC value and they all would have a good profit equal to the DFKE value. Fig. 3b depicts the second region, the economic structure of which is significantly different. Here we have a relatively small resource-rich (OGZV) and relatively large resource-poor

(VZHI) sectors. Under the isolation condition, the economic actors in the region, in the process of sharing among themselves, would receive a cumulative revenue in the OLMI amount, that is, revenue that would only cover the costs (ONHI) and would give zero profit. In other words, region 1a. in an isolation situation can only function as a planned economy. However, in Fig. 1, regions 1a and 1b are not isolated, but are in active economic relations. There is no unhindered movement of production factors between them, but there is a free movement of goods. As a result, a unified price system is established that levels the return on invested capital. This leveling means that the revenue of economic entities in the region 1a has

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become less (OF′K′C), and the profit is lower (DF′K′E). In the region 1b, on the contrary, the revenue of the subjects increased to the OL′M′I value and, accordingly, a profit in the amount ofLL′M′M appeared. Obviously, region 1a sells its products at reduced prices, and region 1b - at inflated prices. Such an alignment of profits is possible when at least two conditions are met.

Firstly, the economy of a region 1a should be large, and the economy of a region 1b should be small. Then a significant increase in prices for products of the region 1b is accompanied by an insignificant decrease in prices for products of the region 1a.

Secondly, the products of the region 1b, despite their cost unprofitability, should be in demand in the region 1a, that is, should be for some reason needed by the consumers of the region 1a, then they can be sold at inflated prices. Let's suppose that the resource-poor sector is represented by innovative industries in the region 1a, and the resource-rich sector is represented by rare natural resources that either have nothing to replace or even import of such resources from abroad is even more expensive in the region 3b [12] . If all conditions are as they

are in the model in Fig. 1, then we are faced with a rather curious case. The region in Fig. 1a also turns out to be the center of innovation development of this national economy and at the same time a hidden resource donor in relation to the region in Fig. 1b - the resource provider. Such a strange combination of the economic functions of the development center and at the same time the resource donor in the region 1a became possible due to a peculiar regional scale effect. The resource-rich sector in the region 1a is so large that its surplus resources are enough to secure profits for their own innovative industries and economic entities in the region 1b. If we scale down the economy of the region 1a and scale up the economy of the region 1b, then sooner or later a situation arises when we would either have to consistently curtail innovative production in the region 1a or strengthen planned mechanisms for the resource redistribution throughout the system.

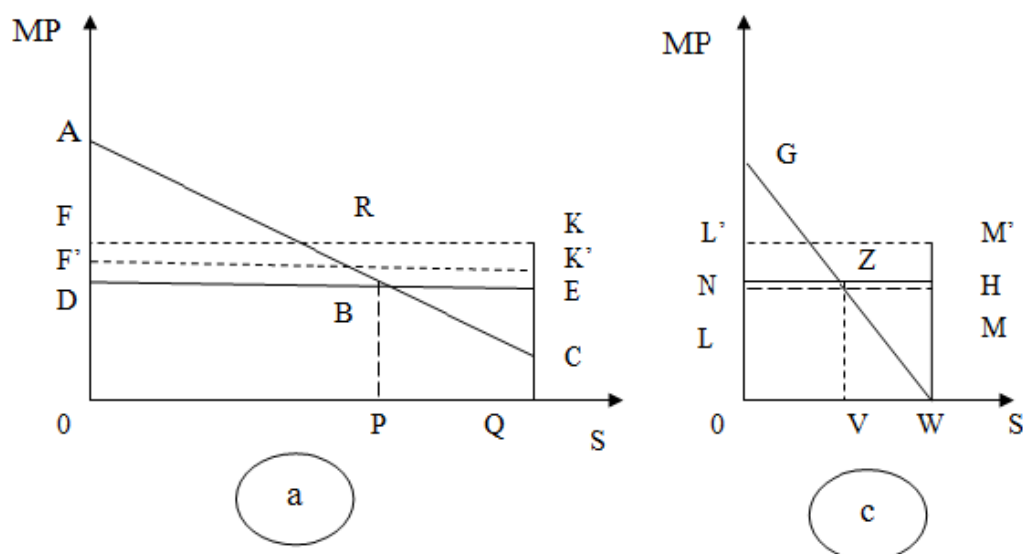Let's turn to study of the situation, which is illustrated in Fig. 2.

Figure 4. Interaction of profitable and unprofitable regions based on a combination of market and planned mechanisms.

In Fig. 2 the national economy is composed again of two regions - Fir. 2a and Fig. 2c. The region 2a in its economic structure is the same as region 1a, but there is a significant difference in the region 2c. For the economic subjects located on the OW segment (Fig. 2c), the situation is similar to the situation for subjects on the OI segment (Fig. 1c). However, if the subjects in the OI segment manage to sell their products at prices inflated against the

cost and they get a normal profit, then the subjects in the OW segment (Fig. 2c) cannot sell their products at inflated prices and their revenues (OLMW) merge with costs (ONHW) and profit is zero. That is, the leveling of profits between the subjects of both regions does not occur. The leveling of profits as in the previous case does not occur due to the fact that, unlike region 1c, the products of region 2c are either insignificant and

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can be abandoned, or may be bought elsewhere on more favorable terms. The indicated difference of region 2c from region 1c in the free market conditions makes the region 2c an economic disaster area. Poverty, crime, separate sentiments and protest actions, spontaneous migration to the territory of the region 2a, etc. flourish there. To prevent such effects, it is more beneficial for the government and the national community as a whole to withdraw part of the profits of economic subjects of the region 2a to the budget and redistribute them in favor of the region 2c. However, if the central government withdraws resources from one group of economic subjects and redistributes them in favor of another group, this is no longer a pure market

economy. Elements of the plan (state regulation) are being introduced into it. Fortunately, in the case described, the regional scale effect is again included: the region in Fig. 2a is large compared to the region in Fig. 2c; therefore, the state withdrawal of resources from the subjects of the region 2a will turn out to be small and will not significantly suppress private enterprise. However, if the scale of region 2a is reduced and the scale of region 2c is increased in the model, then the national economy is increasingly acquiring the features of a planned one.

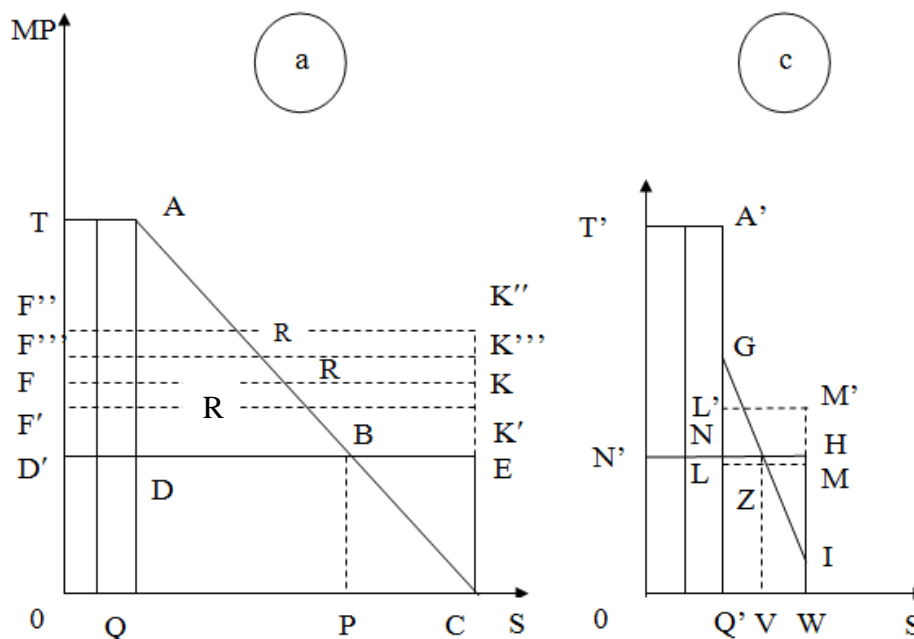Another situation that is very inherent in regional relations is worthy of attention (Fig. 3).

Figure 3 Impact of investments in a developed region on an undeveloped economy

The starting position in the region in Fig. 3a is such that the subjects of this region are located on the QC segment. These entities provide the appropriate output in the QAC amount at QDEC costs. The ratio of resource-rich and resource-poor sectors provides the region with profit and prosperity. The economic entities operate on the Q'W segment in the region in Fig. 3c in the initial position. The ratio of output (Q'GIW) and costs (Q'NHW) is such that under closed conditions, revenue (Q'LMW) coincides with costs and yields zero profit. Just as in the situation in Fig. 4c, the subjects of region 3c cannot raise prices for their products and receive a subsidy in the amount of LL'M'M. Now let us suppose that the prosperous owners of the region 3a builttwo enterprises on n their own funds in the territory of the region 3c, two columns with a total

area of OT'A'Q in Fig. 3c. These enterprises, as seen in Fig. 3c are highly productive, and the cost of output (OT'A'Q') is significantly higher than the costs (ON'LQ'). Arguing purely theoretically, and considering Fig. 3c as a closed system again, the subjects trading only among themselves, it can be argued that the emergence of two highly efficient enterprises sharply increases the share of the resource-rich sector and, accordingly, increases the overall rate of return. However, these enterprises are owned by the subjects of the region 3a. Therefore, despite the territorial affiliation of the region 3c, from the economic point of view they are not included in the resource sector of the region 3c, but in the resource sector of the region 3a (OTAQ, Fig. 3a). Therefore, the share of resource-rich sector did not increase in region 3c, but in region 3a.

Accordingly, the rate of profit has already grown and is already high not in the region 3c, but in the region 3a. As a result, the amount of funds withdrawn from the region 3a to subsidize the region 3c (FF'K'K) remains unchanged. (FF'K'K=F''F'''K'''K''). However, the mass of profits gained by the subjects of region 3a increased (D'F''K''E) and, therefore, the amount withdrawn became even less burdensome for them. In short, as a result of construction and launch of two new enterprises in the region 3c, its economic situation has not changed, and the economic situation of the region 3a has become even better. At the same time, more favorable conditions were formed for strengthening the market principles in the relations of these regions. If we return to the RIA Rating, then the Moscow GRP, which is gigantic in relation to other regions, includes products produced at the enterprises located in other regions, but owned by the owners from Moscow [3]. More than 80% of all Russian funds are concentrated in Moscow (said Sobyanin). Each Moscow resident is accounted for

150 thousand roubles from the budget, while it is 6 times less - only 25 thousand roubles - on average in Russia. The Moscow budget is 13,7% of the federal budget or 18,6% of all the budgets of the subjects. The capital absorbs huge amounts of money while people get pennies and live in emergency housesin the provinces. The average salary is 68 thousand roubles in Moscow and 35 thousand roubles in Russia. Due to the concentration of taxpayers, most taxes flow to Moscow - a quarter of all taxes on income and personal income tax. In the models presented in Fig. 1, 2 and 3, we proceeded from the assumption that all the subjects of this region are able to sell their products equally, and therefore, at least within the region, a single rate of profit is formed. However, a high degree of simplification is used here. As you know, the rate of return has only a tendency to leveling [3]. In this regard, in reality, the products of the resource-poor sector cannot always be sold at prices higher than the cost (Fig. 4).
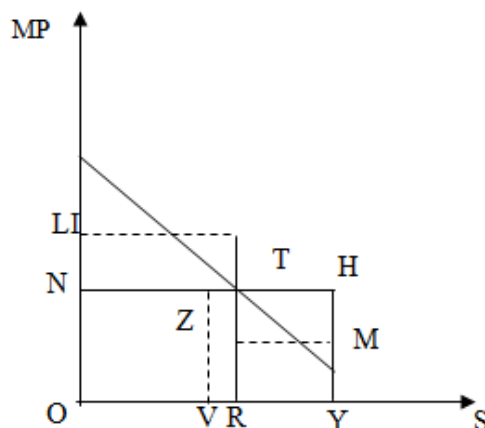

Figure 4. The presence of unprofitable business entities in the composition of resource-poor sector of the region

Fig. 4 shows that the RTHY sub-sector appeared in the structure of the resource-poor sector of the VZHY region, in which economic entities with RKMY revenues are located below costs, i.e. unprofitable entities. With respect to market entities, the market mechanism is only able to work if the loss is short-term and can be covered by a loan. If the loss is chronic and these enterprises for certain reasons, which we are not analyzed now, are inexpedient to be closed, then the only way to reduce them is a planned financial support at the

expense of the regional or federal budget. The larger the sub-sector of unprofitable enterprises and organizations is, the greater the share of federal budget funds in its financing is. In Fig. 4 we showed the economic subjects in the regional economy that cannot sell products at normal prices, but they can still sell them. However, there are economic entities whose products have a value, but cannot be sold at any price in the composition of resource-poor sector (Fig. 5).
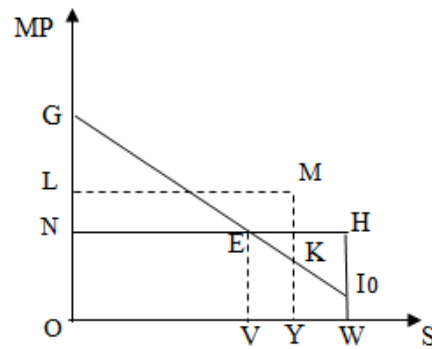
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Figure 5. Presence of economic subjects, whose products are not sold on the market in the composition of the resource-poor sector of the region

In Figure 5, the sub-sector of the resource-poor sector, where utility products are produced[13], but which cannot be sold on the market, is represented by the YKHW rectangle. The breaking of the LM dashed line indicates that the economic subjects of this sub-sector do not have the revenue obtained by selling their products on the market. The main products produced in this sub-sector are basic research and development, weapons, social benefits and services. Obviously, this sub-sector can only exist in terms of budget financing as a whole. Thus, we consistently examined the structure of resource-poor sector and concluded that it consists of 4 main sub-sectors (Fig. 6).
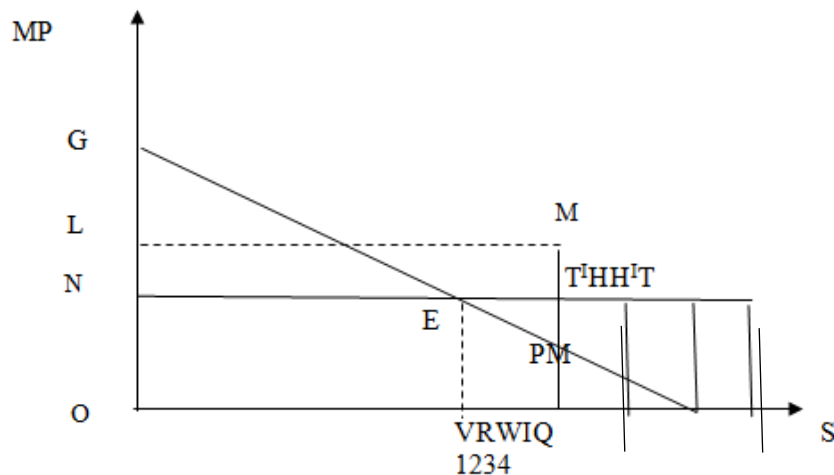

Figure 6. The structure of the resource-poor sector of the region

In Fig. 6 the resource-poor sector (VETQ) is presented by sectors. *The first* VET^{I}R sub-sector is characterized by the fact that it produces products that, in spite of the cost-loss ratio, can be sold at market prices and provide the subjects of the VR segment with normal profit [14-15].

The second sub-sector of the resource-poor sector is RT^I H W. Here are located the subjects, which are perfectly able to sell their products on the market, but at prices that do not cover the costs. Except for cases when the subjects... solve the unprofitability problems due to products or new price regulation, the PTHHM rectangle requires budget financing.

The third sub-sector is WHH^{I}I. Here is concentrated the economic subjects that cannot sell their products at market prices. The role of products and regulated prices is even less significant here and government funding is decisive.

Finally, the fourth sub-sector -IH^{I}TQ - is an excellent investment area. Here, production is absent due to the exclusion of the share of capital investments, and financing is carried out at the budget's expense. Thus, in Fig. 6, thePT^{I}TQ form, except in certain cases, is the scope of planning and budget financing. The main question that arises in this regard is the scale and level of planning and financing.

4.Conclusion

As possible ways of adjusting the fiscal policy to eliminate the existing imbalances in the structure of intergovernmental relations, we can suggest the following:

1. Crediting 60% of the value added tax on goods (works, services) sold in the territory of the Russian Federation to the budgets of the subjects of the Federation. Now 100% of this tax is credited to the federal budget. This measure would additionally attract at least 1.3 trillion roubles to regional budgets (hereinafter, the calculation is taken based on the report on the execution of consolidated budget of the Russian Federation for 2014).

2. Crediting 100% of income tax to the budgets of the subjects of the Federation.

Now about 83% of the specified tax comes to regional budgets, 17% - to the federal budget. This measure would allow in addition attracting at least 400 billion roubles. However, at the same time, it is necessary to fix the obligation to pay income tax in the region where, in fact, the economic activity of the enterprise-taxpayer is carried out, at the legislative level. Otherwise, the 100% transfer of income tax to the regional budgets will further increase the socioeconomic inequality of the regions. Today, a significant number of corporations and large financial and industrial groups are registered and pay taxes in two cities of federal subordination - Moscow and St. Petersburg. The proposed tax maneuver would allow replenishing the consolidated budgets of the subjects of the Federation of not less than 1.7 trillion roubles, which would help alleviate the severity of budget crisis in the regions, avoid defaults of regional budgets and increase funding for the social part of budgets of the subjects of the Federation.

3. Together with the redistribution of part of tax revenues in favor of the budgets of the subjects of the Federation, local authorities should be given the opportunity to regulate the rate of income tax and the part of VAT transferred to the regions. This measure will allow regional authorities stimulating the economic activity. Rate regulation shall be limited to a certain corridor in order to avoid the emergence of "internal offshore companies" in certain regions, with the help of which large corporations will be able to avoid paying taxes.

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