North Caucasian consumer model of economic growth: factors and mechanisms

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Abstract. Socio-economic development management of large territorial complexes requires knowledge of their development model. In historical practice, two large economic development models of territories appeared: consumer model and investment model. The basis of the first one is the demand (needs) of people living in the territory, of the second it is investment in the main capital of territorial economic entities and large infrastructure projects. Essentially, these two models are not based on two mutually exclusive, but on two mutually reinforcing directions of territorial socio-economic development. But anytime there is dominance (and preference) of one or the other direction. Moreover, if we consider their implementation in terms of end results - economic growth rates, expressed in synthetic indicators of territory development, for example, GRP, it turns out that in this regard there is no obvious preference of one over the other. The model of territory socio-economic development based on consumption is relatively conservative evolutionary in nature. As for the investment model, it is more revolutionary in nature and depends on the volume and structure of investments coming into the territorial complex. The authors analyzed the socio-economic development state of a large territorial complex - the North Caucasus Federal District, based on official statistics and long-term observations. They revealed the features of existing development model, formalized and quantified the dependencies of GRP and the factors that ensure its growth. The authors also formulated conclusions and suggestions.

1. Introduction

The territories development is associated with their raw materials, production, labor, demographic, social, political, communication, economic and other resources. Territories with large volumes of strategic (raw materials, production, etc.) resources, objectively choose one economic development model, while resource-poor territories choose another. In international practice (and theory), it is decided to distinguish two large models of economic development. [1, 2] One is based on investments in fixed capital of business entities and territorial infrastructure, the other is based on domestic consumption. The main engine of the first is investments in fixed capital of business entities, which are supplemented by investments in economic (production), as well as related infrastructure (transport, etc.). [3, 4] The main source of territorial development in such models is investments influx and development. This model work is expressed by the investment multiplier, according to which, the increase in investments in OK effects the GRP outstrips both the primary (direct) and secondary (indirect). [5, 6] However, to start the investment multiplier and investment model as a whole working there should be corresponding
investment volumes and structure in the territorial complex. International practice shows that to start the investment multiplier to work (and therefore an investment model), it is necessary to have the investment level at least 30%. [7, 8, 9] Often the investment is not enough and then the investment multiplier stalls, that is reflected in investment return decrease with the degeneration prospect. In conditions of limited access to external financial borrowings (cheap foreign loans) and limited domestic credit resources, the use of investment model becomes difficult. In such case, there are frequent cases of using an inferior (called marginal) investment model with the goal of "staying afloat until favorable market conditions appeared". In this situation, there is an alternative to the investment model - a consumer model or a model based on consumer spending, the main source of which is per capita consumption. [10, 11, 12]

There are many sources of per capita consumption. [13, 14] Under the conditions of natural consumption, economic growth is conservative static and associated not so much with consumption as with the number of consumers. The consumers number growth (which is expressed in population growth) leads to an increase in consumption and is reflected in economic growth. Another option is the consumption growth itself. But, as a rule, with natural consumption, the magnitude of consumption volume and structure remains conservative and, as a rule, does not change, and if it does, it is not in a too wide range, which cannot strongly affect production dynamics and economic growth. Apparently among other things (since essentially it is not so much about consumption as about reproduction, that means much wider contour of development) and therefore national governments aim to reduce natural consumption segment and transfer consumption to money, as more dynamic and with a wide range of development opportunities. In commodity consumption based on exchange of the monetary equivalent available at the consumer’s hands for products in need, cash income, i.e. the estimated cash amount is decisive in consumption. It is cash incomes, their volume and structure, that are determining in consumption volume and structure. They create an analogue of the investment multiplier - the consumer multiplier. [15, 16].

In our opinion, one or the other should not be given unreasonable preference. It seems to us that preference in the growth model in this case is a matter of alternative. If it is not possible to use the investment growth model, then you should use the consumer growth model as a less costly. At the same time, in both cases with the proper use of growth mechanisms specific for these models, we can get a positive effect. In order to describe the choice of consumer model, the authors of the article analyze the economic growth state in the North Caucasus (within the boundaries of the North Caucasus Federal District) and its territories, reveal some dynamic and structural trends, formalize and quantify them.

2. Theoretical and methodological basis of the study
Theoretical basis of this study is the provisions formulated in the works of foreign and domestic authors. [4, 17, 18, 19, 20, 21, 22, 23, 24] The most significant of them: in the conditions of strategic resources shortage, the territorial economic development is based on consumption, in which per capita monetary incomes become the main source of growth; increase in per capita cash income creates a higher increase in production, which is expressed in the GRP growth from the growth in per capita cash income of the population; the increase in gross output (GRP) is not proportional to the increase in per capita income; different levels of growth in per capita incomes correlated to their size affect different growth in GRP. Therefore, the growth GRP from the growth of per capita income at the initial level, i.e. when the value of per capita income does not exceed the value of the subsistence minimum, gives a higher increase in GRP than when the same increase in per capita income corresponds to a higher level of income. In other words, with an increase in the level of per capita incomes, any new growth does not produce a similar increase in GRP.

3. Empirical base and research methods
Empirical base of this study is the official statistics data, systematized in the statistical collections of the Federal State Statistics Service of Russia (Rosstat), its territorial branch in the North Caucasus Federal District, as well as sample surveys of authors that have been carried out since the 90s of the last century. The study uses a set of analytical and descriptive methods to identify, formalize and quantify the
relationship between GRP, per capita cash income, investment and per capita consumption of the population in the North Caucasus as a whole and in the context of its territory. Among analytical methods focus is on correlation and regression methods, which allow to quantify the relationship and determine the proportions between the listed parameters of regional development. Among descriptive ones, attention is paid to the description of the obtained dependences, revealed trends and proportions. The main task is to interpret the obtained calculations. Statistical materials are adapted to work in the PC in standard programs Microsoft Office Excel 2007 and others.

4. Calculations and discussions
If we stick to the multiversion approach to economic development, according to that there is no single model of economic development for all times, peoples and territories, but, on the contrary, every nation forms its development model, in accordance with the climatic, socio-political, ethno-psychological and other conditions. At any time, not only on the planet, but also at the level of macroregions, there is a large number of different economic development models. There is competition between them, of course, but also so-called "peaceful coexistence". Unfortunately, this coexistence is not perceived by so-called economic mainstream, that prefers one model and looks at others through it. Meanwhile, a closer look at the territorial economic development indicates that different territories have their own economic development model.

The stated provisions on the multiversion approach to economic development at the planetary level are obviously also suitable at the national level. At least for a country like Russia, the territory divided by climatic, weather, communication, resource and raw materials, historical, economic, mental and other features, multiversion approach to economic development is justified and promising. At least, it gives more adequate understanding of the territorial (regional) country development features than monocentric (whether in the Anglo-Saxon or Chinese form). One of such macro-regions, which stands out for its special development model, is the North Caucasus. Even being cut down instead of the natural geographical to the administrative level - the North Caucasus Federal District, it is characterized by many features of economic development and growth model.

The North Caucasus within the borders of the North Caucasus Federal District includes Stavropol Territory (Region) and republics: Dagestan, Ingush Republic, Kabardino-Balkar Republic, Karachay-Cherkessia, North Ossetia-Alania, Chechen Republic. The area of the macroregion’s territory is 170.4 thousand square km or less than 1% of the total territory of Russia, and by this parameter the macroregion belongs to the federal district with the smallest area. The population of the North Caucasus Federal District as of January 1, 2019 amounted to 9.866 million people, or 6.7% of the total population of Russia. This macroregion ranks No. 7 among the macroregions of the Russian Federation in terms of population and has one of the best demographic potentials and population growth. In 2017 the volume of the gross regional product (GRP) of the North Caucasus Federal District amounted to 1864722.9 billion rubles, or 2.5% of the GRP of Russia. According to this parameter, the North-Caucasian Federal District takes the last place in Russia, and this place has been reserved for it since 2010. The value of fixed capital in 2018 amounted to 52,20064 million rubles, or 2.5% of the total volume in Russia. The volume of investments in the fixed capital in 2018 amounted to 550,920 million rubles, or 3.1% of the total volume in Russia. The gross agricultural output of the macroregion in 2018 amounted to 461495 million rubles, or 8.6% of the total gross agricultural output in Russia and takes the fifth place among the macroregions in the country. For certain types of agricultural products: vegetables, fruitage, sheep and goats, poultry, as well as grain, the macroregion and its districts are included in the group of advanced regions in Russia. The gross industrial output in 2018 amounted to 631331 million rubles, that is 0.9% of the total in the Russian Federation. Thus, in terms of industrial output, the macroregion ranks one of the last places in the Russian Federation. As for mining operation, the volume of that in 2018 amounted to 26,105 million rubles, or 0.14% of the total in Russia, this is also one of the lowest indicators among the macroregions of Russia. The manufacturing output in 2018 amounted to 438133 million rubles, or 1.0% of the total in Russia. According to this indicator, as well as to the previous one, the macroregion holds steadily the last position among the Russian macroregions.
At the same time, in terms of resource potential (agricultural area, arable land, mineral and organic stocks), labor force, population, number of consumers, climate, weather, etc. the macroregion has the potential for self-sufficiency and formation of its local competitive socio-economic development model. However, it should be noted that there is a weak manufacturing and transport infrastructure, diversification of the economy, division of labor, weak transport communications, etc., which restrains the economic development of the territories and the macroregion as a whole.

Summarizing various aspects of the resource, raw materials, manufacturing, business, logistics and other potential of the microregion the authors should determine relatively prospective development model of the North Caucasus and its territories.

Comparison of official statistics in 2010-2017 of GRP, per capita income, per capita consumption, investment in fixed capital, and other indicators of regional development in the North Caucasus and its territories, indicates, firstly, the presence of marked synchronism between all of the above parameters, which indicates the presence of a high connection between them, secondly, noticeable differentiation of this dependence within the territory between different entities. Consequently, we can say that the GRP of the North Caucasus and its territories is highly dependent on the size and growth of per capita income, investment in fixed capital, as well as per capita consumption. And per capita consumption is dependent on per capita income. Moreover, it should be pointed out that the degree of synchronization of the GRP curves, per capita cash income, per capita consumption and investment for the period 2010-2017 (and in 2018 with the exception of GRP) turns out to be higher both, in the North Caucasus as a whole and in its territories, than in Russia as a whole. The latter suggests that, firstly, per capita cash income and per capita consumption influence the dynamics of GRP in the North Caucasus more than in Russia as a whole, and secondly, their influence is stronger than investment in fixed capital. Based on these provisions, it can be assumed that there is a consumer growth model in the North Caucasus, according to which the main growth engine is not investment in fixed capital, but per capita cash income and per capita consumption. This assumption is based on a visual comparison of GRP curves, per capita cash income, investments in fixed capital and per capita consumption for the period 2010-2017, and requires confirmation using analytical methods and quantitative calculations, i.e. based on formalization and quantification of the alleged relationships.

In practice, the problem is solved on the basis of correlation and regression analysis. The correlation and regression analysis, which resulted in the pair correlation coefficients between the factors taken into account, as well as the regression equations, allows us to compare the dependencies between GRP, investments in fixed capital, per capita cash income, per capita expenditures, as well as between the latter in the North Caucasus as a whole, as well as in the context of its individual territories. Correlation analysis revealed, firstly, the presence of a strong positive relationship between GRP and the factors taken into account, as well as between per capita expenditures and per capita expenses, which can be interpreted as following: with increasing factors, there will be also an increase in GRP and cheap expenses with per capita income growth. Secondly, in the North Caucasus, as in Russia as a whole, the dominant factor determining the GRP dynamics is the size of per capita cash income. In terms of level, the correlation coefficient between GRP and per capita cash incomes in Russia as a whole exceeded the similar coefficient of GRP with investments, 0.982 against 0.961, and in the North Caucasus, accordingly, 0.997 against 0.964. At the same time (thirdly), not only between the North Caucasus and Russia as a whole, but also within the North Caucasus between its territories, there is a noticeable differentiation in the value of the correlation coefficients. In general in the North Caucasus the correlation coefficients value is higher than in Russia as a whole, which can be interpreted as the fact that per capita cash income, investments in fixed capital and per capita consumption in the North Caucasus have a stronger effect on the GRP dynamics than in Russia as a whole. Although, the consumer model is dominant both, at the national and macroregional levels, i.e. GRP growth model from per capita cash income and per capita consumption, rather than from investments in fixed capital. The same should be said about the effect of per capita cash income on per capita consumption, i.e. in the North Caucasus the influence of per capita cash income on per capita consumption is stronger than in Russia as a whole. However, (fourthly), the quantitative parameters revealed that the GRP and per
capita consumption depend on relevant factors in the North Caucasus and turn out to be noticeably differentiated in its territories. Moreover, there is a variation within the parameters at the territorial level.

The calculated regression equations for GRP from per capita cash income, investments in fixed capital and per capita consumption, as well as between the last ones in the North Caucasus and in the context of its individual territories, allows us to highlight a number of features in the GRP change (as well as in per capita consumption change). These features are dependent on the volume changes of investments in fixed capital, per capita cash income and per capita consumption in the North Caucasus as a whole and its territories. To simplify the calculations, the authors calculated linear one-factor regression everywhere. The regression equations calculations showed that the parameters values of the regression equation differ both, in the context of factors and in the context of territories determined by factors. Firstly, the value of the basic (passive) parameter \( (a_0) \), which shows the average effect on the resultant attribute (GRP in the first three equations and per capita consumption in the fourth one) of unaccounted factors, [25] varies by territory and factors. For the same factors (according to the regression equations), there is a strong variation between the Russian, North Caucasian, and intra-Caucasian ones, both in direction (signs) and in absolute values of the basic parameter \( (a_0) \). For one regression equation, the basic parameter value in Russia as a whole is higher than in the North Caucasus as a whole; for other equations, we can observe the opposite situation, which is supplemented by intra-Caucasian territorial diversity. Secondly, the active parameter value \( (a_1) \) – the regression coefficient, which shows how much the average value of the productive attribute changes with increasing factor attribute by a unit of eigenvalue, [25] as well as with the previous (basic) parameter of the regression equation both, by regression equations and by territories. It is noteworthy that, with the exception of the last regression equation (between per capita consumption and per capita cash income), the value of the regression coefficient in Russia as a whole turned out to be higher than in the North Caucasus as a whole. True, while in terms of per capita cash income and per capita consumption, federal level superiority was almost 30 times higher, in relation to investments in fixed capital it was only about 0.9 points higher. As for the relationship between per capita consumption and per capita money income, here, on the contrary, the value of the regression coefficient in the North Caucasus is 0.043 points higher than in Russia as a whole. Within the North Caucasus per capita cash incomes had the greatest impact on GRP growth in the Stavropol Territory (29.64) and Dagestan (26.17). (It should be noted that in the Stavropol Territory the basic parameter of the investment regression equation was almost 5 times higher than in Dagestan). The increase of GRP from investments in fixed capital to the greatest extent among the North Caucasian territories was formed in the Stavropol Territory (5.07) and Chechen Republic (4.63), and the weakest / lowest was in Ingush Republic (1.94), Karachay-Cherkessia (2.03). As for the increase of GRP from per capita consumption, it turned out to be the most significant in the Stavropol Territory (35.77) and Dagestan (26.47), and the weakest in North Ossetia-Alania (6.69) and Kabardino-Balkar Republic (7.31).

The increase of per capita consumption from the per capita cash income increase had a positive relationship everywhere, but at the same time it showed the greatest dependence in Dagestan (1.009), and the lowest in Karachay-Cherkessia (0.466), in other territories its influence varied around the value 0.811 - 0.849.

It is characteristic that the regression coefficient for per capita cash income and per capita consumption is everywhere in favor of the last ones, although in a different proportion. The greatest differences were observed within the North Caucasus in Karachay-Cherkessia (6.6) and the Stavropol Territory (5.13), and the smallest differences in Dagestan (0.3 points in favor of per capita consumption).

The analysis of the growth model with the use of one-factor models is complemented by a multifactor (three-factor: per capita cash income, investment in fixed capital and per capita consumption) growth model. The calculation of the GRP dependence on three factors (per capita income, investment and per capita consumption) in the Russian Federation, in the North Caucasus, and in terms of its territory showed, firstly, a high influence level of three factors on GRP (cumulative coefficient determination is from 97% to 99%), secondly, an influence strength gradation of these factors on the GRP growth. So, if per capita consumption dominates in the Russian Federation as a whole (which is also repeated in the
North Caucasus Federal District, as well as in Dagestan, Kabardino-Balkar Republic, Karachay-Cherkessia and Chechen Republic), per capita money income is in second place (the exception is Ingushetia and Stavropol Territory where this factor dominates among the three considered), and investment is in third place (with the exception of North Ossetia-Alania, where this factor is in second place in order of importance). As for investments, it should be noted that their influence was not always positive. For example, in the Stavropol Territory, the regression coefficient for this parameter was (-) 3.41, which means that for any investment increase per GRP unit, this coefficient will decrease by 3.41 points. Another feature of the obtained equations in terms of investments is the fact that, for example, in the Russian Federation as a whole, in the North Caucasus, as well as in Ingush Republic, Kabardino-Balkar Republic and Chechen Republic, the regression coefficient value for this parameter, although it was positive, turns out to be less than 1, and in Karachay-Cherkessia is even less than 0.1 points. In other words, in such a growth model, in order to ensure growth due to investment increase, it is necessary to carry out huge investment injections, so that the current investment volume in regional (and presumably also national) economy is much lower than the volume that can make investments to a forming economic growth factor. The latter can be interpreted not in favor of investment factor and investment growth model. This state of the coefficient under the investment factor is explained by the fact that neither in the country as a whole, nor in the North Caucasus and its territories (with the exception of Dagestan and North Ossetia) the investment growth model does not work. In Dagestan and North Ossetia, such a model is valid, although very weak.

Comparison of the GRP connection strength with per capita cash income and per capita expenditure of the population within the North Caucasus in the context of its individual territories, allows us to note several features. The first one shows that in different territories, the strength of connection (correlation coefficient, as well as corresponding regression coefficient) between GRP and per capita cash income is different, although it is always dominant compared with investments in fixed capital. This means that the unit of per capita income increase in different territories gives different increase in GRP and, therefore, the same per capita income increase in different territories has different result (GRP increase). From an economic point of view, this means that in order to obtain a higher GRP increase it is necessary to increase per capita income in those territories where the return on the latter is higher. Thus, through the manipulation of per capita incomes, economic growth can be achieved. But then we face social and other contradictions in the territorial development. The second second one states that the same per capita cash income growth in different territories gives different results (GRP growth). Moreover, per capita income increase in some territories does not give the expected GRP growth. There is a decrease in returns on per capita income growth. Therefore, to obtain the desired GRP growth, it is necessary to manipulate the size of per capita income growth.

5. Conclusions
Firstly, the formation of economic dynamics (expressed in the GRP growth) in the North Caucasus as well as in Russia is determined by per capita money income and per capita consumption of the population. The investments impact is noticeably lower here than in Russia as a whole, although in Russia, investments do not significantly affect the GRP growth rate.

Secondly, even in this general trend in the North Caucasus in the context of territories, there are so-called territorial differences reflecting more or less influence of per capita income and per capita consumption, as well as investment. The most industrialized in the past territories of Kabardino-Balkar Republic, North Ossetia-Alania and the Stavropol Territory still retain the industrial segment in their model, what can be seen from the example of a high (by the standards of other territories) regression coefficient by the investment parameters.

Thirdly, there is a kind of competition between per capita cash income and per capita consumption in the formation of the general GRP growth trend. Per capita consumption most often (in most territories) is a more influential factor in the GRP growth than per capita cash income. This situation is explained, on the one hand, by the low level of per capita cash income (as soon as its level grows, it decreases in
proportion to the volume of per capita consumption) and the high level of natural consumption in the region and certain territories.

As for noted above contradictions between the dynamics of per capita cash income growth and GRP growth in the context of territories and in the North Caucasus as a whole, it is explained, in our opinion, firstly, by the different level (size) of per capita income of the population in different territories, i.e., that if in Dagestan in 2017 per capita income amounted to almost 30 thousand rubles, then in Ingush Republic it is only 15 thousand rubles. The presence of such differentiation, in our opinion, is a condition for a different reaction of GRP to both, the per capita income size and growth, and for a different structure of per capita income of territories, i.e., we mean the distribution of the population by per capita income (decile and quantile distributions). In some areas, the share of low-income people is higher than in others. The same situation is with high income. We believe that both of these features affect the influence dynamics and the per capita income size and growth on the GRP growth.

The general summary: currently, consumer and investment are competing growth models. International practice has shown that the investment model is more competitive, i.e. when the growth is formed by investment. The reason for this preference (competitiveness) is that the investment multiplier gives a larger GRP growth than the income one, i.e. the investments growth unit gives a higher GRP increase than the same unit of per capita income or per capita consumption growth. The latter is also explained by the fact that investing in the economy is “limitless”, while consumption is limited, i.e. increasing the investment volume in the economy can be infinite and unlimited (roughly speaking, the economy will process any amount of investment), while the per capita cash income growth is limited in its consumption (with the increasing of the income volume to a certain level, savings / accumulation increases as well).

Due to the revealed features, it was conceivably reasonable, firstly, to increase the per capita cash incomes size of the population in the North Caucasus as a whole and in the most lagging territories, and secondly, to bring their level to the average Russian level at least. Such a change in this parameter will certainly have a positive effect on the GRP growth dynamics of the macroregion and individual territories. As for investments, their low level does not allow fast and high returns; therefore, this factor loses to consumption in the economic dynamic’s formation. But in order to make the investment model work in the North Caucasus, it is necessary to have multiply larger investment volumes than now. Moreover, it is not so much critical to chase the investments volumes as their sectoral and territorial structure, i.e. we need so-called segmental and targeted investments, and not to smear the investments volume received through state support in general for the territorial complex. It is necessary to industrialize and innovate individual segments in territorial complexes, that will generate growth in other segments and sectors of the regional economy after investment and innovation models are earned. Secondly, it is necessary to form not local regional (territorial) complexes, when each territory duplicates the branches and industries already formed in the neighboring territories and have a comparative advantage, but to create an organic macroregional territorial complex based on principles of economic regionalization and comparative advantage.

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