Investments in fixed capital and the prospects for sustainable development of the eastern border regions of Russia

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Abstract. The article is devoted to the analysis of the economic effects generated by the investments in the economy of the eastern border regions of Russia: the subjects of the Far Eastern Federal District and the Baikal region. Interregional comparisons and contrasts of the economic development indicators for 2011-2018 are given in comparable prices with 2011 as the base year. We discuss the factors hindering the accelerated growth of the economies of these regions. Particular attention is paid to the structure of investments in fixed assets, their effectiveness and impact on the specifics of the socioeconomic development in individual regions. There are multidirectional tendencies in the socioeconomic development of the studied regions. An analysis of investment flows and indicators of socioeconomic development in the eastern regions of the Russian Federation reveals that the existing institutional environment does not yet ensure sustainable economic development in the east of Russia. The integration processes here are hampered by an excessively strong dependence on the federal centre and a focus on specific investors. Therefore, the eastern Russian regions are forced to build their economic policy, focusing on creating attractive conditions for large investors. The stability of economic growth can be ensured only through stable growth of the region population and improvement of the human capital quality. For the successful implementation of large-scale development plans for the east of Russia, it is necessary to stop the processes of depopulation of the territory and maintain optimal proportions between the economic and demographic reproduction.

1. Introduction

In recent decades, increased attention has been paid to the socioeconomic development of the east of Russia as a macro-region of strategic importance for ensuring the national security and integrity of the country. In the state policy of Russia, it is assigned as strategic priorities. Over decades, the Government of the Russian Federation has accepted several federal targeted programs for the socioeconomic development of the Far East and Transbaikalia. However, none of them gave the planned results: there are serious discrepancies between the desired and the actual results [1-4]. There is no adequate return from the specially created institutions of the "new model" of the Far Eastern macro-region development (the Ministry for the Development of the Russian Far East, etc.). According to estimates [1, 5, 6], there is a clear contradiction between the stated goals, new institutional instruments and the first results achieved.

The aim of this study is to assess the economic effects generated by the investments in the economy of the eastern border regions of the Russian Federation involved in cross-border
cooperation with the Asia-Pacific countries. We hypothesize that attracting investment to the region is a key factor of not only accelerated but also sustainable development in the studied regions.

We analyzed the economic indicators for 2011-2018 in the Russian Federation subjects, including in the Far Eastern Federal District (FEFD) and the Baikal region (BR): the Republic of Buryatia and the Republic of Sakha (Yakutia), Kamchatka, Khabarovsk, Primorye and Transbaikal territories, Amur, Irkutsk, Magadan and Sakhalin Regions, the Jewish Autonomous Region (Jewish AR), and Chukotka Autonomous Area (Chukotka AA). These regions are united by their border position, rich natural resource potential and historically established natural resource orientation of their economies as well as cross-border cooperation with the countries of the Asia-Pacific region (APR), among which there are rather close trade and economic ties, primarily with China.

2. Models and methods
The study was carried out using GIS technologies, comparative analysis as well as economic and statistical methods based on open official statistical information from the databases of the Federal State Statistics Service (Rosstat).

The research period is 2011-2018: since the beginning of economic stabilization after the 2008-2009 crisis, covering the time when the regional economies were significantly affected by external shocks in 2014 (significant fluctuations in oil prices, the sanctions policy of western countries and the associated food embargo of Russia as well as the devaluation of the Russian ruble), and the adaptation period, the beginning of the formation of import substitution processes.

In interregional comparisons and contrasts, all indicators are given in comparable prices; the base year is 2011. The presented indicators were calculated using regional indices of physical volume of investments in fixed capital (FC investments) and the indices of physical volume of gross regional product (GRP).

3. Results and discussion

3.1. Investments in fixed capital and the gross regional product
The regions of the Russian Federation selected for analysis differ in many respects. In the context of this study, they should be primarily compared in the level of economic development. The most common statistical indicator characterizing the regional economy, its structure and development dynamics is the volume and growth rate of the gross regional product.

The total GRP and investments in fixed capital dynamics for the subjects discussed from 2011 to 2018 in comparable prices are shown in figure 1. Noteworthy is the stratification of regions into two groups, between which there is a very significant gap. The obvious leader here is the Irkutsk Region, whose GRP is several times higher than that of the outsider regions. With some separation from the leader, such regions as Sakhalin Region, Republic of Sakha (Yakutia), Primorye and Khabarovsk territories are grouped. Their total GRP varies from 400 to 600 billion rubles. The total GRP of other regions does not exceed 200 billion rubles. Moreover, the dynamics of changes in the GRP volume for the analyzed period has a pronounced tendency for growth only in three regions: Irkutsk and Sakhalin regions as well as the Republic of Sakha (Yakutia). All other regions have maintained their indicators or even decreased them.

For the dynamics of investment volumes, it is difficult to identify any trend common to all regions. In the studied period, the positive dynamics of growth in the volume of FC investments, as well as the GRP volume, is observed only in two regions, the Irkutsk Region and the Republic of Sakha (Yakutia) (figure 1).

The growth of FC investments relative to 2011 ranged from – 66.9% (Primorye Territory) to 67.0% (the Magadan Region); in the Russian Federation as a whole, it was 4%. At the same time, the increase in the GRP volume during the same period varied from – 11.2% (the Jewish AR) to 27.3% (the Irkutsk Region); throughout the Russian Federation, it was 11.5% (figure 2).
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Figure 1. Dynamics of the total investments in fixed capital and total gross regional product from 2011 to 2018, billion rubles, in the 2011 prices.

For Trans-Baikal Territory and Amur Region, a positive increase in the investment volume was rather accompanied by a decrease in GRP than an increase. Conversely, in Kamchatka and Khabarovsk territories, as well as in Sakhalin Region, a negative increase in investment corresponded, however, to a positive increase in GRP. Since the growth rates are presented in percentages, it is noteworthy that only for two regions (the Irkutsk Region and the Chukotka AA), there is an approximate correspondence between the investment growth and the GRP growth. In other cases, the increase in investment (in percentage terms) significantly exceeds the corresponding increase in GRP.

Figure 2. The growth of investments in fixed capital and gross regional product in the eastern regions of the Russian Federation in 2018 relative to 2011, %.

An important indicator of opportunities for economic growth is the share of FC investments in the GRP. Only one Amur Region, apparently due to the construction of the Vostochny Cosmodrome, has sharply increased this share: in 2018, it reached 83.4%. At the same time, in seven regions of this group, in 2018, this indicator dropped below 25%, which is a constraining factor for economic development. This circumstance creates a negative background in assessing the possibilities of
The accelerated socioeconomic development of territories, especially in the long term. Moreover, even the regions that seem to be relatively prosperous in terms of this indicator are not very far from this important security boundary: the Trans-Baikal Territory – 27%, the Magadan Region – 33.8%, the Jewish AR – 30.7%, and Yakutia – 37.2%.

In the total volume of FC investments, investments aimed at reconstruction and modernization play a special role. They determine the possibilities and prospects for the accelerated economic development in the region. The impossibility of renewal and modernization of production can also manifest itself as crisis phenomena in the social sphere and exacerbate the existing social inequality. Of particular concern is the situation that in 2018 the share of reconstruction and modernization in the total volume of FC investments in most studied regions ranged from 5 to 20% (table 1). Perhaps, only Buryatia and Khabarovsk Territory steadily increase the share of investments allocated for the modernization and reconstruction of production. In all fairness, it should be noted that a reasonable structure of investment funds does not guarantee by itself an accelerated economic growth.

Table 1. Share of investments in fixed capital aimed at reconstruction and modernization.

| Regions               | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 |
|-----------------------|------|------|------|------|------|------|------|------|
| Irkutsk Region        | 15.2 | 17.6 | 15.7 | 15.9 | 20.0 | 18.3 | 16.2 | 20.0 |
| Republic of Buryatia  | 22.3 | 26.9 | 25.9 | 20.1 | 36.5 | 32.6 | 33.4 | 24.8 |
| Republic of Sakha (Yakutia) | 4.6  | 5.4  | 8.3  | 5.6  | 5.8  | 5.8  | 3.5  | 5.3  |
| Trans-Baikal Territory| 38.0 | 43.2 | 39.0 | 19.0 | 21.0 | 22.4 | 17.0 | 23.6 |
| Kamchatka Territory   | 18.0 | 25.8 | 30.0 | 24.5 | 19.8 | 15.9 | 17.4 | 14.3 |
| Primorye Territory    | 11.0 | 10.7 | 20.3 | 14.2 | 13.3 | 16.6 | 14.7 | 15.5 |
| Khabarovsk Territory  | 11.9 | 15.9 | 18.3 | 20.1 | 22.3 | 23.0 | 22.2 | 25.1 |
| Amur Region           | 11.8 | 13.0 | 32.0 | 12.0 | 18.2 | 14.3 | 10.7 | 11.4 |
| Magadan Region        | 16.7 | 9.7  | 7.8  | 6.0  | 2.8  | 7.7  | 7.8  | 7.3  |
| Sakhalin Region       | 8.2  | 8.9  | 12.8 | 12.1 | 11.4 | 4.9  | 6.2  | 5.3  |
| Jewish AR             | 9.6  | 11.1 | 31.4 | 20.4 | 26.6 | 25.8 | 33.7 | 20.7 |
| Chukotka AA           | 41.4 | 13.3 | 6.3  | 7.5  | 6.1  | 4.3  | 7.1  | 11.4 |

A large differentiation among the studied regions is also observed in the distribution of per capita FC investments (figure 3). In 2011, the size of per capita investment in all “old” regions of the FEFD 1.4-3 times exceeded the average Russian level, and in Sakhalin Region – 4.6 times. However, in 2018, the situation somewhat changed: the gap from the average Russian indicator decreased in many regions, Yakutia is now in the lead (the excess is already 3.75 times), Magadan and Amur regions join the leading group of regions with an excess of more than 2 times. Primorye, Khabarovsk and Kamchatka territories are moving into the group of outsiders, which is formed by the Baikal region subjects: here, the per capita volume of FC investments is significantly lower than the average Russian level. The Irkutsk Region is leaving this subgroup. It is possible that, taking into account the outstripping growth of GRP in the Irkutsk Region for the considered period, this circumstance indirectly indicates a high efficiency of the investment use in the regional economy.

It should be noted that at the beginning and the end of the considered period, only in 5 regions out of the 12 studied ones, the per capita GRP exceeds the national average one. These are the northern Far East regions and Sakhalin. For the southern and “new” regions of the FEFD, the situation has only worsened (figure 4). Therefore, there is no talking about the advanced development of the Eastern territories yet.

As mentioned above, investment growth does not always correspond to GRP growth (figure 2). Figure 5 shows that there is no definition in this issue: regions that fall into the same class in terms of the accumulated volume of per capita FC investments summarized for 2011-2018 have
multidirectional vectors of the GRP growth rates for the same period. These are, for example, the Amur and Magadan regions, the Jewish AR, Primorye Territory, the Irkutsk Region, and the Kamchatka Territory.

![Figure 3. Per capita FC investment, % of the average Russian value.](image)

![Figure 4. Per capita GRP, % of the average Russian value.](image)

We evaluated the efficiency of investment in regional economies from 2011 to 2018. As an estimate, we considered both the indicator of the investment cost of the produced GRP (the ratio of the volumes of FC investments per unit of gross value added) and the investment return (the amount of the produced GRP per unit of the investments). According to our calculations, in 2018, the Amur Region economy had the highest investment cost: for 1 ruble of gross value added 4.3 rubles of investment
were spent summarized for 2011-2018. In Russia as a whole, this value was 1.78. The lowest investment cost of GRP was in the Chukotka AA and the Kamchatka Territory, in the Irkutsk Region and the Republic of Buryatia (1.6-1.7). Figure 6 shows the differentiation of regions in terms of the accumulated volumes of per capita FC investments received in 2011-2018 and their efficiency. The investment efficiency is calculated as the ratio of the GRP produced in 2018 per unit of costs (FC investments accumulated for 2011-2018) upon receipt. For the Russian Federation as a whole, this indicator is 0.56. Very low values of this indicator were in the Amur Region and the Jewish Autonomous Region: here, 1 investment ruble created 0.2 and 0.3 rubles of GRP, respectively.

3.2. Sectoral structure of investments in fixed capital and the gross regional product

Figure 7 shows the distribution of FC investments received from 2011 to 2018 by individual types of economic activity (TEA). In most studied regions, a significant part of FC investments was directed to the TEA “Transport and Communications” and the raw material industries.

In the sectoral structure of FC investments, investments to the TEA “Mining”, “Manufacturing” and “Building” practically in all considered regions occupy a significant place. In 2018, in five subjects of the group, their total volume exceeded 52% of the total volume of FC investments; an insignificant share of investments in these industries (20-26%) was in the Kamchatka, Primorye and Khabarovsk territories, and the minimum – in the Jewish Autonomous Region (13% in amount, although in 2016 their amount exceeded 41%). In Kamchatka Territory, significant shares of FC investments went to “Fishing and fish farming”; in the Amur and Magadan regions, the Jewish AR and Chukotka AA – to “Production and distribution of electricity, gas and water”.

Additionally, during the reviewed period, some structural changes in the distribution of FC investments by industry were revealed in all regions. The share of FC investments directed to the above-mentioned sectors has increased markedly. Significant increases in FC investments are observed for the TEA “Mining” in Primorye (6 times) and Transbaikal (3 times) territories; the TEA “Manufacturing” – in the Amur Region (105 times) and Primorye Territory (6 times), and the TEA “Building” – in Sakhalin Region (12 times), the Jewish AR (10 times) and the Kamchatka Territory (5 times).
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Figure 7. Spatial distribution of the accumulated FC investments from 2011 to 2018 (billion rubles) and their sectoral structure.

With regard to GRP among the considered regions in this period, such striking changes are observed only in the TEA “Mining”: in the Jewish Autonomous Region, its share showed a 25-fold increase, and in the Irkutsk Region and the Trans-Baikal Territory, the growth was 188 and 242% (figure 8).

Figure 8. Per capita GRP (rubles) and its sectoral structure in 2011 and 2018.

However, it is important to note the differences in the GRP structure in the considered period. The leader, the Irkutsk Region, has a share of the TEA “Manufacturing” steadily decreasing as well as the Republic of Buryatia. Only in the Kamchatka Territory, the trend towards an increase in the share of manufacturing industries persists. In this pattern, the position of the Trans-Baikal Territory attracts
attention. Not being essentially a purely raw material region, the Trans-Baikal Territory does not have a developed manufacturing industry. The implementation of Soviet projects, such as the construction of the BAM, the development of the Udokan copper deposit etc., did not change the position of Chita Region (now the Trans-Baikal Territory) as one of the transit regions, which gets little from the development of cooperation with the APR countries.

Undoubtedly, investments in “Building” play an important role in the socioeconomic development of the regions. They are often the locomotives of economic growth. Furthermore, their decrease almost inevitably leads to stagnation. This largely applies to the studied eastern regions. In the analyzed period, perhaps, only one region showed a relatively stable trend towards an increase in GRP for a given TEA, the Republic of Sakha (Yakutia). The opposite situation is typical of other regions.

4. Conclusion
An analysis of investment flows and indicators of socioeconomic development in the eastern border regions of the Russian Federation reveals that the existing institutional environment does not yet ensure sustainable economic development of the east of Russia.

In the socioeconomic development of the eastern regions of the country, there are multidirectional trends. In contrast to certain positive changes in the economic and investment activity, the population of the regions continues to decline both due to the migration outflow and as a result of negative natural increase (decrease) [7-9]. The number of the economically active population employed in the real economy is also declining.

The current structure of economic relations in Russia does not imply the development of “horizontal” ties at the regional level, especially in the Far Eastern macro-region. Integration processes here are hampered by an excessively strong dependence on the federal center and the focus on specific investors.

The main conclusion, in this regard, is that the eastern regions of the country are forced to build their economic policy, focusing on creating attractive conditions for large investors. The stability of economic growth can be ensured only through a stable growth of the population in the regions and an improvement of the human capital quality. For the successful implementation of large-scale plans for the development of the Far East, it is necessary to stop the processes of depopulation of the territory and maintain optimal proportions between the economic and demographic reproduction [7, 8].

Perhaps, new institutional forms, such as TAD / PSEDA (territories of advanced development / priority social and economic development areas), will become attractive for investors, but they are unlikely to play the role of drivers for the socioeconomic development of the regions [5, 6, 10-12].

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References
[1] Antonova N E and Lomakina N V 2020 Institutional innovations for the development of the East of Russia: effects of implementation in the resource region J. Sib. Fed. Univ. Humanit. Soc. Sci. 13(4) 442-52 doi:10.17516/1997-1370-0580
[2] Antonova N E 2020 Forest complex of the Far Eastern federal district in the «new format»: opportunities and problems of the affiliated territories Regionalistics 7(3) 5-23 doi:10.14530/reg.2020.3.5
[3] Demyanenko A N 2019 A few words about the draft of National Program for the development of the Russian Far East Regionalistics 6(3) 5-12 doi:10.14530/reg.2019.3.5
[4] Minakir P A 2019 “Program” economy: the Far East Spatial Economics 15(2) 7-16 doi:10.14530/se.2019.2.007-016
[5] Isaev A G 2018 Policy instruments of the Russian Far East economic development and regional economic security Regionalistics 5(6) 70-82 doi:10.14530/ reg.2018.6.70
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IOP Conf. Series: Earth and Environmental Science 629 (2021) 012017
doi:10.1088/1755-1315/629/1/012017

[6] Arai H 2019 New instruments attracting investment into the Russian Far East: preliminary assessment Spatial Economics 15(1) 157-69 doi:10.14530/se.2019.1.157-169

[7] Motrich E L 2020 The population of the Far Eastern federal district: realities and prospects Regionalistics 7(2) 64-71 doi:10.14530/reg.2020.2.64

[8] Shvorina K V and Faleychik L M 2018 The main trends of migration mobility of the population of the regions of the Siberian and Far Eastern federal districts Economy of Region 14(2) 485-501 doi:10.17059/2018-2-12

[9] Prokapalo O M, Bardal A B, Isaev A G, Mazitova M G and Suslov D V 2020 Economic situation in the Far Eastern federal district in 2019 Spatial Economics 16(2) 142-84 doi:10.14530/se.2020.2.142-184

[10] Izotov D A 2017 The Far East: Innovations in public policy Problems of Economic Transition 59(10) 799-813 doi:10.1080/10611991.2017.1416839

[11] Minakir P A and Prokapalo O M 2017 Problems of Economic Transition 59(10) 778-98 doi:10.1080/10611991.2017.1416838

[12] Parfenova K and Gurova O 2020 Migration and investment activity in the regions of the Siberian federal district of the Russian Federation Journal of Urban and Regional Analysis 12(1) 75-90 doi:10.37043/JURA.2020.12.1.5