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Tax revenues, public investments and economic growth rates: evidence from Russia

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ABSTRACT

This article analyzes the economic effects of public investments in Russia. The correlation between gross regional product growth rates and public capital accumulation has been identified. It has been found that regional investments stimulate growth much better than federal ones. Therefore, the transfer of federal resources to regional levels, as well as a more precise tailoring of investment policies to the needs of individual territories, should contribute to a rise in productivity and an increase in regional growth rates. The findings show that investments from subnational budget sources are closely correlated to regional tax revenues. Therefore, the fine-tuning of the revenue-sharing mechanism in the larger fiscal federalism framework, the expansion of the regional tax base, the improvement of tax collection and tax administration systems, and other related measures represent the main focus areas for expanding investment opportunities at the provincial level. In the long term, this way of regional development is expected to be more efficient and sustainable compared to the current emphasis on the implementation of large developmental projects at the expense of the federal budget. These aspects of Russia's experience seems to be valid for the entire Eurasian continent, as seen by the scale of infrastructure projects initiated there in recent years under the framework of "One belt-One Road" and other development initiatives

KEYWORDS

Economic growth, infrastructure development, public investment, regional economy, tax revenues

JEL R11, R53, H72

HIGHLIGHTS

1. Subnational investments from regional budgets positively influence the rate of regional development, whereas the role of federal investment, most often, is negative or statistically insignificant

2. The fine-tuning of the revenue-sharing mechanism, the expansion of the regional tax base, the improvement of tax collection and tax administration systems, and other related measures represent the main focus areas for expanding investment opportunities at the provincial level

3. Since federal investments are considered inferior to regional ones in terms of provincial growth stimulation, transferring most of the investment resources to the subnational level could be beneficial for overall growth rates

4. Comprehensive use of local resources for federal construction projects allows to maximize the macroeconomic effects not only in Russia, but also in several Eurasian states, currently implementing large-scale infrastructure development initiatives

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Налоговые доходы, бюджетные инвестиции и темпы роста экономики: опыт российских регионов

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АННОТАЦИЯ

В данной статье на примере российских регионов исследуются экономические эффекты бюджетного инвестирования. Оценка корреляции темпов роста валового регионального продукта с накоплением общественного капитала показывает, что региональные инвестиции стимулируют рост намного лучше, чем федеральные. Следовательно, передача федеральных ресурсов на региональный уровень, а также более точная ориентация инвестиционной политики на особенности отдельных территорий должны способствовать ускорению национального экономического развития. Кроме того, инвестиции за счет субнациональных бюджетов тесно коррелируют с региональными налоговыми поступлениями. Следовательно, точная настройка механизма бюджетного федерализма в области доходов, увеличение налоговой базы субъектов Российской Федерации, улучшение собираемости налогов и другие аналогичные меры являются главным направлением расширения инвестирования на региональном уровне. В долгосрочном плане, этот путь территориального развития представляется более эффективным и устойчивым, чем реализация крупных проектов за счет федерального бюджета. Перечисленные аспекты российского опыта актуальны для всего евразийского континента, где в последние годы в рамках проекта «Один пояс-один путь» и других инициатив начато создание крупных инфраструктурных объектов за счет бюджетных источников

КЛЮЧЕВЫЕ СЛОВА

Экономический рост, развитие инфраструктуры, бюджетные инвестиции, региональная экономика, налоговые доходы

ОСНОВНЫЕ ПОЛОЖЕНИЯ

1. Капиталовложения из региональных бюджетов позитивно влияют на темпы территориального развития, однако роль федеральных инвестиций, чаще всего, отрицательна или статистически незначима

2. Увеличение налоговых доходов субъектов Федерации представляет собой главный и наиболее эффективный путь расширения региональных инвестиций

3. Поскольку федеральные инвестиции уступают региональным в плане территориального стимулирования роста, передача большинства инвестиционных ресурсов на субнациональный уровень может привести к повышению суммарных темпов экономического развития

4. Комплексное использование местных ресурсов в процессе строительства за счет федерального бюджета позволяет максимизировать получаемые макроэкономические эффекты не только в России, но и в ряде Евразийских государств, осуществляющих крупные проекты инфраструктурного развития

Introduction and the scope of this research

The Eurasian continent deservedly draws attention from all over the world as a unique research field for specialists in territorial development. Eurasia stands out for its experience with multilateral financial institutions, its operation of large integration groupings, and its achievement of intensive economic interaction among key players. Important developments in recent years have included new large-scale development initiatives, the establishment of previously absent institutions, and the emergence of additional opportunities for infrastructure construction

within the frameworks of: the Eurasian Economic Union promoted by Russia, the One Belt-One Road initiative suggested by China, the Asian Development Bank lead by Japan, and many other important and actively working organizations.

In the vast Eurasian expanse, Russia possesses the largest territory and has accumulated the broadest experience in spatial development. As recent history shows, the "Turn East" policy initiated by Russia in the middle of the last decade gradually acquired the features of a comprehensive governmental program, one effectively oriented for sustainable regional growth. The implementation of large infrastructure projects, the shifting resources to the Asian part of the country and the establishment of regional development institutions have had a profound effect on the economic dynamics of the Russian provinces.

All these facts underline the importance of analyzing and disseminating best practices in the accumulation of public capital for regional development. The existing economic literature on this topic has taken one of two approaches. The first examines the role of the state in the formation of public capital and the related productivity issues [1; 2]. The second group of studies views the accumulation process as a precondition for the performance of public finance functions such as macroeconomic regulation, income redistribution and the provision of public goods [3].

Russia-based studies have been conducted in both directions but reached contradictory conclusions. Some papers argue in support of the positive role of investment (including public ones) in boosting economic growth [4], while others insist budgetary investments have no or an adverse impact on both growth rates and the reduction of regional disparities [5].

Even more important than these conflicting conclusions, however, is the fact that significant dimensions of Russia's situation have not yet been properly analyzed in the economic literature. Among these issues are: the breakdown of public investment into federal and regional sources, the grouping of Russian provinces according to the dynamics of the investment process, and the statistical relationship between public investment and regional growth rates. These omissions constitute the focus of this paper. After an empirical overview of budgetary investment understood as an increase of public capital, this paper looks at an econometric model assessing the interaction of investment and economic growth in Russia's regions, before concluding with some policy implications. These topics provide important insight into the promotion of international projects currently being implemented on the Eurasian continent.

Theoretical issues and literature review

Existing approaches to the analysis of budget investments can be divided into two parts. The first group of works considers investment as a form of accumulation of social capital and deals with its productivity issues. In particular, a representative analysis of meta-data from 93 studies on this subject made it possible to conclude that in the post-war period in most countries the cumulative effect of public spending was rather positive, although not very significant [1]. A subsequent review of 76 sources led to a similar conclusion about the positive and statistically significant but relatively small contribution of social capital to the growth of gross output [6]. The positive contribution was limited to the educational and infrastructure components of investments in social capital. In the regional context, the latter's positive influence was recorded for US states [7]. An analysis of the prefectures of Japan showed that the effect depended on the study period and the type of region. At the stage of rapid economic growth in the 1950–1970s, the role of social capital was unambiguously positive. However, in the 1980s and 1990s, negative contribution prevailed in less developed areas, indicating an excessive accumulation of public capital [8]. This was the result of significant changes in the Japanese regional policy after the first oil shock, when the center of gravity was switched from the stimulation of growth to a more even distribution of public goods throughout the country [9; 10].

For Russia, such studies have long been limited to the contribution of all accumulated capital to GDP growth or total factor productivity (a literature review is provided in [11]). In the first work, which divided the role of private and public funds, a positive and significant correlation of the output with public investment was established, but the accuracy of the constructed model raised serious doubts [12]. Later, a more accurate econometric analysis confirmed the conclusion about the positive and significant contribution of social capital to the economic dynamics [13].

The second group of works in the field of budgetary investments considers them as the process of formation and maintenance of fixed capital necessary for performing the basic functions of public finance, i.e. macroeconomic regulation, redistribution of resources and provision of public goods. Theoretically, budget investments should act as a tool to stimulate economic growth, equalize the levels of economic development and improve the social environment [3]. But according to the results of empirical studies, the elasticity of GDP on budgetary investments can have negative values [14], international and regional convergence is not always followed by investment [15], and simple expansion of budgetary investments does not necessarily lead to the desired social outcome [16].

Studies on the materials of Russia also lead to contradictory conclusions. Some papers cite arguments in support of the positive role of investment (including budgetary ones) in boosting the growth of the economy [4], while others mention the zero or even negative impact of budgetary investments on growth rates and regional differences [5]. However, the greatest difficulty is that some aspects of the Russian situation are not represented in the economic literature at all. This refers to the division of federal and regional investments, the analysis of different functions of public finance, the statistical correlation of budget investments and the quality of the social environment, etc.

Both mentioned approaches to budget investments (productivity of social capital and functions of public finance) seem to be really important and promising. However, the research on productivity (the first approach) is nearly impossible, because of the absence of necessary data. That is why this paper is focused on the stimulation, redistribution and public goods provision functions of budget investment (the second approach). After this brief literature review, the paper describes the specifics of budget investments, followed by a statistical analysis of the correlation of investment with regional growth rates and the quality of the social environment, and concludes with policy implications and recommendations. Such research provides a new answer to the question of priorities and prospects for investment policy in modern Russia.

Public investments and tax revenues in Russia

The existing information on public investments in Russia is very limited. According to available data, one can assess only the broadest features of the investment process. The main indicators related to the investment process are shown in Table 1.

Table 1

The main indicators of the investment process in Russia, %

Indicator	1995	2000	2005	2010	2015	2016
Gross savings to GDP	27.5	33.6	30.6	25.1	27.2	27.3
Gross fixed capital formation to gross savings	76.4	54.5	58.1	83.7	76.3	77.0
Gross fixed capital formation to GDP	17.5	16.5	16.7	20.4	19.6	20.4

Source: [17].

Gross savings in Russia are only slightly lower than that of the middle-income countries, while gross fixed capital formation lags far behind. The gap between the rate of gross savings and capital formation reaches 5 % of GNI and is among the highest in the world (Table 2). This figure illustrates the well-known fact that Russian savings do not turn into investments because of a weak financial sys-

tem, a bad investment climate and conservative government policies.

In 1995–2016, the ratio of budgetary investments to Russian GDP fluctuated between 2.3 and 4.1 % (Table 3). This roughly matched the figures from the bottom quarter of OECD countries, the average of which was around 4 % [19].

As for the relative contribution from federal and subnational sources, during the 1990s we observed a reduction in the federal contribution (from 1.9 % to 0.9 % of GDP), which reflects the general shift of expenditures to the subnational level (Figure).

However, since 2006, there has been an increase in the distribution of federal sources, which peaked in the crisis year of 2009 (1.9 %), and then started to fluctuate between 1.2–1.5 %. From 2010–2016, federal investments exceeded regional ones by 0.1 to 0.6 %. Apparently, this dynamic is a reflection of the evolving reality of Russian budgetary federalism.

Table 2

Gross fixed capital formation and gross savings, % of GNI

Country	Gross fixed capital formation		Gross savings	
	2005	2016	2005	2016
Brazil	17	15	17	14
China	41	44	48	46
India	39	30	38	30
Japan	25	23	28	27
Kazakhstan	31	27	29	21
Poland	20	20	17	19
Russian Federation	20	23	31	25
South Africa	18	19	15	16
Ukraine	23	22	26	17
United States	23	20	18	18
Uzbekistan	18	25	...	...
World	25	24	26	24
Low income	17	26	...	14
Lower middle income	28	27	29	28
Upper middle income	30	32	34	31
High income	23	21	23	22

Source: [18].

Table 3

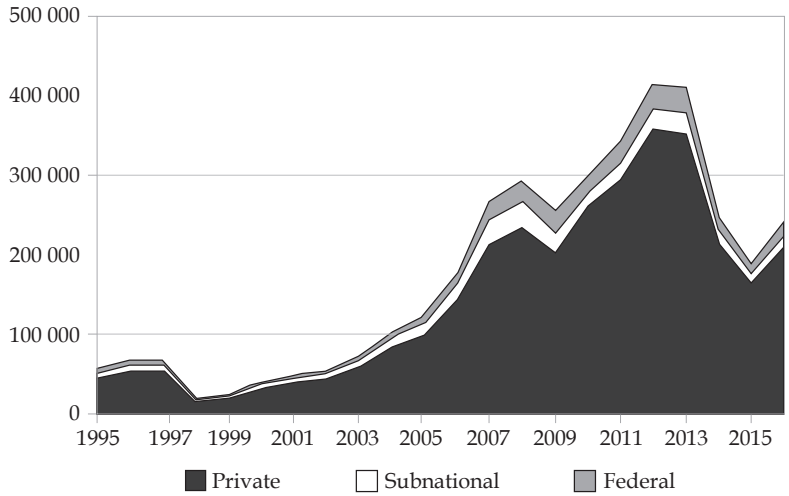
Investments in fixed assets in Russia

Indicator	1995	2000	2005	2010	2015	2016
billion rubles (1995 – trillions of rubles)						
GDP	1 429.0	7 306.0	21 610.0	46 309.0	83 232.6	86 043.6
Investments	267.0	1 165.2	3 611.1	9 152.0	13 897.2	14 639.8
Investments*, including:	267.0	1 053.7	2 983.2	6 625.0	10 496.3	11 266.9
federal budget	27.0	69.2	202.2	661.9	1 185.5	1047.9
subnational budgets**	27.5	151.2	365.1	542.8	736.0	907.2
% of GDP						
GDP	100.0	100.0	100.0	100.0	100.0	100.0
Investments	18.7	15.9	16.7	20.3	16.7	17.0
Investments*, including:	18.7	14.4	13.8	14.7	12.6	13.1
federal budget	1.9	0.9	0.9	1.5	1.4	1.2
subnational budgets**	1.9	2.1	1.7	1.2	0.9	1.1

* Since 2000: without small business entities and unobserved economic activity.

** Budgets of Russian provinces and municipalities.

Source: [20, pp. 579–581].



Investment in fixed assets in Russia, millions of USD at official rate

Third, the largest share of public investments (about 26 % of all federal investments in 2016) was directed to transport and communications, first and foremost to road construction. Nevertheless, as a percentage of GDP, road construction was only 0.3 % of GDP in 2016, compared to the 1 % recommended by the European Union to its members.

During the 2000s, there was considerable growth in the amount of investment carried out on the basis of the program budgeting method. In the federal budget, the share of programmed investments increased from 16.8 % in 2001 to 47.4 % in 2016. It should be noted that more than half (55.0 %) of all allocations went to the program "Development of the Transport System of Russia in 2010–2020".

Budgetary investments are very unevenly distributed across the country. During the same period of 2000–2015, the share of the 10 richest regions (leading in terms of per capita GRP) fell from 60 % to 38.2 %, while the share of the 10 poorest regions increased from 1 % to 6.8 %. Clearly, the spatial distribution of investments has become more egalitarian.

An interesting picture is drawn by the analysis of the spatial distribution of public investment stock. Since the deflators for budget investments are not available, we will calculate them in US dollars at the official exchange rate. For the period of 1995–2015, budgets of all levels invested in the Russian economy total 751.5 billion dollars (346.7 federal and 404.8 regional, see Table 4).

44.7 % of federal investment was channeled into the top ten regions. This composition illustrates the federal government's investment priorities, which include the two Russian capitals with their adjacent territories, a number of provinces with large national projects (the Sochi Olympics in 2014, the Summer Universiade in 2013, the APEC summit in 2012, etc.), and the North Caucasian republics that were severely damaged during a war against Islamic terror. Subnational investments are distributed even more unevenly. The top ten account for 63.8 % of public investment, 47.2 % for the first three provinces and 25.6 % for Moscow. The allocation of subnational investments depends, predominantly, on the financial capabilities of the provinces and reflects the uneven distribution of budgetary resources across the country.

Tax revenues are also very unevenly distributed throughout the country. This is a well-documented fact, thoroughly discussed in the relevant literature [21–23]. 52.5 % of tax revenues are collected in the 10 most economically developed provinces of Russia, with Moscow accounting for 22.3 % of the total amount. Preliminary estimates show that the tax revenues of regional budgets are closely related to bud-

Table 4

Spatial distribution of public investment and tax revenues (stock, 1995–2015), billion dollars

	Federal budget sources			Subnational budget sources			Tax revenues*	
1	Moscow	34.2	1	Moscow	103.6	1	Moscow	442.5
2	Krasnodarskii krai	24.5	2	Tumen oblast	65.4	2	Tumen oblast	169.9
3	Saint-Petersburg	19.2	3	Saint-Petersburg	22.1	3	Saint-Petersburg	114.3
4	Moscovskaya oblast	13.9	4	Tatarstan republic	13.4	4	Moscovskaya oblast	110.2
5	Primorskii krai	13.1	5	Bashkort. republic	10.7	5	Sverdlovskaya oblast	53.8
6	Dagestan republic	11.9	6	Krasnodarskii krai	9.3	6	Krasnoyarskii krai	50.7
7	Tatarstan republic	10.3	7	Moscovskaya oblast	9.2	7	Tatarstan republic	49.2
8	Voronezh oblast	9.3	8	Sverdlovskaya oblast	8.7	8	Krasnodarskii krai	48.7
9	Chechen republic	9.3	9	Dagestan republic	8.3	9	Bashkortostan republic	39.4
10	Rostov oblast	8.7	10	Nizhegorodskaya oblast	6.9	10	Samarskaya oblast	39.1
	Total for 10 provinces	155.0		*Total for 10 provinces*	258.1		*Total for 10 provinces*	1 117.7
	Total Russia	346.7		*Total Russia*	404.8		*Total Russia*	1 981.3

* For the years 2000–2015.

get investments, with the partial correlation coefficients being positive for regional (0.6, significant at 0.01) and negative (–0.28, significant at 0.01) for federal investments. Such a preliminary conclusion seems to be very important for this research and requires additional verification.

This brief overview shows that both public investments and tax revenues differ greatly in volume, dynamics and spatial allocation. We can reasonably suggest that they also have differing impacts on the economic dynamics of the tax collecting and investments receiving provinces. Let us try to test this assumption using the available data.

Correlation of public investment, tax revenues and economic growth

In this part we will try to establish a correlation between the indicators of public investments and the parameters of the regional economy, concentrating on the efficacy of public finances in stimulate economic growth. The estimation model is described by the formula:

$$Y = \mu + \beta_{inv} Inv + \sum_{i=1}^{n} \beta_i X_i + \sum_{i=1}^{n} \beta_i Z_i + \varepsilon,$$

where Y is the dependent variable, namely: GRP index; μ is a constant; *Inv* are shares of federal, subnational and other (private) investments in GRP; i — provinces of Russia; β_{inv} and β_i are the estimated partial correlation coefficients; X is a vector of constantly present control variables; Z is a vector of additional control variables that reflect the characteristics of the regional economy; ε is the statistical error.

The observation period covers 13 years from 1997 to 2009. Data on autonomous okrugs are included for the larger provinces, and the Chechen Republic is excluded due to missing data, bringing the number of regions to 79. The vector of constantly present control variables X consists of the following indicators: 1) Labor (index of employment); 2) Tax-revenues (tax revenues of subnational budgets as % of GRP). The vector Z includes Jan-temp (the normalized average temperature of January with the value for Russia taken as 1). In addition, some dummy variables were introduced into the X vector, such as dummies for the crisis years of 1998 and 2009 (*cr98, cr09*) as well as for the Republics of Kalmykia, Mordovia and the Chukotka Autonomous Okrug, which have a number of outstanding features in regional development and investment process (*kalmyk, mordov, chukot*).

Statistical characteristics of the variables are provided in Table 5.

The estimation results are shown in the Table 6. Estimation 1 includes only control variables X, in Estimation 2 the *Jan-temp* variable is added, and Estimation 3 includes the entire set of control variables X and Z.

Table 5

Description of variables (1997-2009, for 79 regions)

Variable	Mean	Min	Max	SD	Description
1.Inv-priv	0.174	0.002	1.023	0.096	Private investment share in GRP (%)
2.Inv-reg	0.020	0.000	0.227	0.018	Subnational budgetary investments share in GRP (%)
3.Inv-fed	0.031	0.000	0.433	0.041	Federal budgetary investment share in GRP (%)
4.Labor	0.998	0.866	1.173	0.024	Employment index
5.Tax-revenues	0.144	0.012	1.148	0.056	Tax income of subnational budgets to GRP (%)
6.Jan-temp	0.984	0.076	3.100	0.660	The average temperature in January (normalized with Russia's average value = 1)

Source: Rosstat data.

Table 6

OLS estimation results (GRP index as a dependent variable)

Independent variables and estimation results	Estimation		
	1	2	3
Intercept	–0.159 (–1.802)	–0.142 (–1.599)	0.422 (5.085)
1.Inv-priv	0.200* (7.074)	0.199* (7.052)	0.217* (8.753)
2.Inv-reg	0.066** (2.018)	0.062*** (1.899)	0.088* (3.090)
3.Inv-fed	–0.06** (–1.997)	-0.07* (–2.264)	–0.030 (–1.259)
4.Labor	0.384* (13.542)	0.380* (13.413)	0.207* (7.721)
5.Tax-revenues	–0.16* (–5.181)	–0.152* (–4.885)	–0.244* (–8.019)
6.Jan-temp	–	–0.06* (–2.175)	–0.08* (–3.314)
7.Kalmyk	–	–	0.034 (1.331)
8.Mordov	–	–	0.035 (1.495)
9.Chukot	–	–	0.154* (5.651)
10.Crisys-98	–	–	–0.33* (–13.080)
11.Crisys-09	–	–	–0.37* (–14.912)
Number of observations	1 027	1 027	1 027
Multiplied R2	0.479	0.483	0.668
Adjusted R2	0.225	0.229	0.441
F-statistic	60.907	51.731	74.730
Standard Error	0.065	0.065	0.055

T-statistic in parenthesis; statistical significance: * = 0,01; ** = 0,05; *** = 0.10.

All estimation models indicate a difference in correlation between investments and GRP depending on the source of financing. Private investment (1.Inv-priv), as common sense would suggest, has a positive and statistically significant impact on the gross output. The same applies to regional budgetary investments (2.Inv-reg). Federal investment betas (3.Inv-fed), however, are conspicuously negative. This means either that federal investment slows economic development or that it is systematically allocated to lagging regions. In either case, the stimulus provided by federal investments to regional economies is not only low, but, quite probably, negative.

Panel data estimates return the same results (Table 7).

The panel data results confirm the earlier conclusion about the serious difference between the correlations of certain types of investments with the GRP index. Private and regional investments have a significantly positive impact on the growth of provincial economies, but the correlation with federal investments appears to be steadily negative.

The role of federal investment in stimulating the provincial economy

The significantly negative correlation between federal investments and the rate of provincial economic growth

Таблица 7

Panel data estimation results (GRP index as a dependent variable)

Independent variables and estimation results	*BE* (*t*)	*FE* (*t*)	*GLS RE* (*z*)
Intercept	0.130 (0.58)	0.440 (5.01)	–0.422 (5.08)
1.Inv-priv	0.107* (4.20)	0.204* (8.01)	0.168* (8.75)
2.Inv-reg	0.372* (2.58)	0.275** (1.69)	0.354* (3.09)
3.Inv-fed	–0.164** (–2.73)	–0.002 (0.03)	–0.06*** (–1.27)
4.Labor	0.944* (4.14)	0.621* (7.00)	0.654* (7.82)
5.Tax-revenues	–0.318* (–4.01)	–0.315* (–6.66)	–0.322* (–8.01)
6.Jan-temp	–0.09* (–3.93)	Dropped	–0.009* (–3.32)
7.Kalmyk	0.043* (2.52)	Dropped	0.022 (1.33)
8.Mordov	0.025*** (1.80)	Dropped	0.023 (1.49)
9.Chukot	0.109* (4.74)	Dropped	0.102* (5.65)
10.Crisys-98	Dropped	–0.091* (–12.74)	–0.092* (–13.09)
11.Crisys-09	Dropped	–0.105* (–14.85)	–0.102* (–14.91)
Number of obs. (groups)	1 027 (79)	1 027 (79)	1 027 (79)
R2 within	0.237	0.442	0.441
R2 between	0.588	0.198	0.549
R2 overall	0.255	0.419	0.447
Wald chi2	–	–	821.86
F-statistic	10.96	106.89	–

BE — between effects (*t*-statistic in parenthesis), *FE* — fixed effects (*t*-statistic in parenthesis), *GLS RE* — general least square model with random effects (*z*-statistic in parenthesis).

is one of the most important results of the performed statistical analysis. This is an unexpected phenomenon, especially when compared to the state development programs that have been implemented in recent years. Conversely, regional investments have had a clearly positive impact on growth rates. This situation has already been described in the economic literature and has been repeatedly noted, for example, in Japan from 1990–2008 [14]. In some sense, this outcome appears quite understandable, given the central government's focus on projects of national importance, projects which do not necessarily generate immediate economic returns, as opposed to the activities of regional authorities, which are less subject to the influence of politics or corruption, and which generally produce greater economic benefits.

One reason for the low stimulus provided by federal investments can be attributed to the inevitable drop in the marginal productivity of capital that coincides with its accumulation. The excessive capacity of social capital (unnecessary bridges, roads, dams, etc.) is indeed a by-product of Japan's fiscal stimulus policy. However, in Russia's case, the poor state of the country's economic and social infrastructure means that this is not a likely explanation for the inefficiency, nor is excessive capacity likely to become a significant problem within the next few decades.

Fortunately, a much more likely explanation for the Russian economic situation exists. A massive influx of budgetary investments can lead to a suppression of private funding. Indeed, the economy of any region has an "absorption capacity" in the form of limited opportunities for roads, electricity, labor markets and other factors. If this capacity is exceeded, then public investment displaces private, initiating a so-called "crowding out effect". The clearest illustrations of the crowding out mechanism come from the Winter Olympics in Nagano (1998), the Olympic Games in London (2012) and the G-20 Summit in St. Petersburg (2013). These enormous public events led to a decrease of customers to peripheral private facilities, because tourists feared visiting potentially overcrowded cities.

The existence of a "crowding out effect" might be proved by a negative correlation of federal and private investments and, in fact, some calculations show that federal and private investments have just such a negative correlation [24]. This phenomenon, however, likely has several causes. First of all, the central government tends to invests in regions that are not attractive to private capital, in order to compensate for a lack of financial resources. However, we should not reject the earlier hypothesis that large federal projects in small regions could displace or "crowd out" private investments. Most likely, both processes proceed simultaneously and their relative importance could only be separated by conducting further research.

Conclusion and policy implications

Several important conclusions can be drawn from this statistical analysis. First, budget investment in Russia clearly falls into federal and subnational categories. These investments are concentrated in different regions, have differing structures, and vary in their ability to stimulate gross output. Investments from regional budgets, as a rule, positively influence the rates of regional development. The role of federal investment, most often, is negative or statistically insignificant. Consequently, the concentration of financial resources at the national level, which has increased in recent years, is an important trend within the Russian government, which orients itself around federal political priorities more than regional economic concerns.

Second, our findings show that investments from subnational budget sources are closely correlated to regional tax revenues. Therefore, the fine-tuning of the revenue-sharing mechanism in the larger fiscal federalism framework, the expansion of the regional tax base, the improvement of tax collection and tax administration systems, and other related measures represent the main focus areas for expanding investment opportunities at the provincial level. In the long term, this way of regional development is expected to be more efficient and sustainable compared to the current emphasis on the implementation of large developmental projects at the expense of the federal budget.

Third, the search for a balance of political and economic factors should be based on regional inclusion and a thorough consideration of regional specifics. In most Russian provinces, federal investments are inferior to regional ones in terms of efficient growth stimulation. Apparently, this conclusion could serve as the basis for reviewing the existing models of intergovernmental fiscal relations and transferring most of the investment resources to the subnational level. As for the small and poorly-funded provinces of Russia, the most urgent task is to increase the scale of federal inflows. In regions suffering from an overall lack of capital, the optimal policy would be to expand the investment possibilities through all available sources. In resource-rich areas where budgetary investments are not effective enough, it makes sense to consider the substitution of public funds with private ones, but regardless of regional specifics, the investment allocation model should be based on the criteria of economic efficiency. If decisions are made based on political considerations, the consequences should be assessed by evaluating the gain or loss of efficiency. This would introduce a measurement of economic costs to each step taken and considerably raise the quality of political management.

Forth, as the development of the vast virgin territories accelerates on the Eurasian continent, huge transport and energy infrastructures will develop alongside new opportunities for international integration. The majority of plans carried out by the Eurasian Economic Union, the New Silk Road and the Asian Development Bank have important political dimensions. This fact once again underlines the need to consider both political and economic factors. The balance of political and economic priorities represents the most difficult part of development process, but theoretically it is achievable even when executing the largest projects. The example of Russia suggests that the inclusive development

and comprehensive utilization of local resources in the process of all-nation infrastructure construction allows for enhanced long-term political effectiveness alongside a short-term gain from the revival of provincial economic dynamics. These aspects of Russia's experience seems to be valid for the entire Eurasian continent, as seen by the scale of infrastructure projects initiated there in recent years under the framework of "One belt-One Road" and other development initiatives.

References

1. Nijkamp P., Poot J. Meta-analysis of the effect of fiscal policies on long-run growth. *European Journal of Political Economy*, 2004, vol. 20, no. 1, pp. 91–124. DOI: 10.1016/j.ejpoleco.2003.10.001.

2. Garsia-Mila T., McGuire T., Porter H. The effects of public capital in state-level production function reconsidered. *Review of Economics and Statistics*, 1996, vol. 78, pp. 177–180.

3. Tanzi V., Schuknecht L. Public spending in the 20th century: A global perspective. Cambridge University Press, 2000. DOI: 10.1017/CBO9780511625800.

4. Ledyaeva S., Linden M. Determinants of economic growth: empirical evidence from russian regions. *The European Journal of Comparative Economics*, 2008, vol. 5, no. 1, pp. 87–105. Available at: http://eaces.liuc.it/18242979200801/182429792008050105.pdf.

5. Drobyshevsky S., Lugovoy O., Astafyeva E., Polevoy D., Kozlovskaya A., Trunin P., Lederman L. *Faktory ekonomicheskogo rosta v regionakh RF* [Factors of economic growth in Russia's regions]. Moscow, Institute of Economics in Transition Publ., 2005. 278 p.

6. Bom P., Ligthart J. How productive is public capital? A meta analisis. *CESifo working paper*, 2008, no. 2206. Available at: https://ssrn.com/abstract=1088651.

7. Munnell A. How does public infrastructure affect regional economic performance? *New England Economic Review*, 1990, September/October, no. 9, pp. 11–32. Available at: http://www.bostonfed.org/economic/neer/neer1990/neer590b.pdf.

8. Yoshino N., Nakano H. Regional allocation of public investment into the metropolitan region. In: Hatta T. (ed.) *Economic Analysis of Tokyo Monopolar System*. Tokyo, Nihonkeizaishinbunsha Publ., 1994. Pp. 161–190.

9. Kataoka M. Effect of public investment on the regional economies in postwar Japan. *Review of Urban and Regional Development Studies*, 2005, vol. 17, no. 2, pp. 115–139.

10. Yamano N., Ohkawara T. The regional allocation of public investment: efficiency or equity? *Journal of Regional Science*, 2000, vol. 40, no. 2, pp. 205–229. DOI: 10.1111/0022-4146.00172.

11. Izyumov A., Vahaly J. Old capital vs. new investment in post-soviet economies: conceptual issues and estimates. *Comparative Economic Studies*, 2008, vol. 50, no. 1, pp. 79–110. DOI: 10.1057/palgrave.ces.8100237.

12. Dodonov B., Hirschhausen C., Opitz P., Sugolov P. Efficient infrastructure supply for economic development in transition countries: the case of Ukraine. *Post-Communist Economies*, 2002, vol. 14, no. 2, pp. 149–167. DOI: 10.1080/14631370220139909.

13. Kortelaionen M., Leppanen S. Public and private capital productivity puzzle revisited in Russia. In: *A nonparametric investigation, proceedings, european economic. Association 25th annual meeting*, 23–26 August 2010, Glasgow.

14. Bruckner M., Tuladhar A. Public investment as a fiscal stimulus: evidence from Japan's regional spending during the 1990s. *IMF working paper,* 2010, WP/10/110. 34 p. Available at: http://www.imf.org/external/pubs/ft/wp/2010/wp10110.pdf.

15. Aninat E., Bauer A., Cowan K. Addressing equity issues in policymaking: lessons from the chilean experience. In: Tanzi V., Chu K., Gupta S. (eds) *Economic policy and equity*. Washington DC: IMF, 1999. Pp. 109–149.

16. Fingleton B. Regional economic Growth and convergence: insights from spatial econometrics. In: Anselin L., Florax R., Rey S. (eds) *Advances in spatial econometrics.* Berlin, Springer, 2004. Pp. 397–432. DOI: 10.1007/978-3-662-05617-2_19.

17. *Investments in Russia.* 2017. Moscow, 2017. 190 p. Available at: http://www.gks.ru/free_doc/doc_2017/invest.pdf.

18. *World development indicators 2017*. Oxford, 2017. 146 p. Available at: https://openknowledge.worldbank.org/handle/10986/26447.

19. Russia: towards improving the efficiency of public investment expenditures. *The World Bank Report*, September 18, 2001, no. 22693-RU. 80 p. Available at: http://documents.vsemirnyjbank.org/curated/ru/768921468335997060/pdf/multi0page.pdf.

20. *Russian statistical yearbook*. Moscow, 2016. 725 p.

21. Bella D., Dynnikova O., Grigoli F. Fiscal federalism and regional performance. *IMF Working Paper*, WP/17/265. 23 p.

22. Lehmann H., Silvagni M. Is There convergence of Russia's regions? Exploring the empirical evidence: 1995–2010. *OECD Economics Department Working Papers*, 2013, no. 1083. DOI: 10.2139/ssrn.2321098.

23. Pokrovskaya N. The Payment of the personal income tax to local budgets of the Russian Federation. *Ekonomika. Nalogi. Pravo* = *Economics, Taxes & Law*, 2017, vol. 10, no. 3, pp. 146–151. (In Russ.).

24. Belov A. Theoretical and empirical considerations in researching of public investments in Russia. *Zhurnal ekonomicheskoi teorii* = *Journal of Economic Theory*, 2012, no. 4, pp. 85–95. (In Russ.).

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