PUBLIC-PRIVATE PARTNERSHIP IN INFRASTRUCTURE: BUDGET EXPENDITURES' EFFICIENCY INCREASE IN RUSSIA

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Abstract. The article contains a methodology for formalized evaluation of alternative models of replacement of budget funds by private investment in the public infrastructure projects in the PPP's forms. The theoretical explanation of the origin of PPP as a structural relationship of economic system capable to organize the optimal combination of formal and informal institutions allows an economic system not only to stabilize the pace of economic growth but also to stimulate its long-term increase. In the situation of economic growth slow-down in Russia, it is extremely important to determine some standard of PPP in the sphere of public infrastructure projects, that could allow to reduce capital expenditures of the budget and their replacement by private investment. To organize the optimal hybrid forms of PPP-projects in infrastructure there have been modeled their alternative structures, which give different economic results in terms of reducing budget expenditures and growing GDP rates.

Keywords: public-private partnership (PPP), formal institutions, public infrastructure projects, budget deficit, fiscal consolidation, budget capital expenditures.

1 Introduction

The global crisis of 2008-2009 has made the obvious trend of the global economy' slow-down, despite the differences in GDP growth rates in various groups of countries (IMF, 2017). According to EBRD' experts, starting from 2018, the global economic growth is likely to vary around 3% (EBRD, 2018). Accepting this trend as a given, the article raises the question of the possibilities of national communities to institutionalize such forms of potential investors' cooperation that would allow in the foreseeable future to damp the negative economic trends using the potential of organizational forms of business. The latter are directly connected with factors of inclusive economic development that have been little studied today (World Economic Forum, 2018).

Taking into account the low economic growth rate in Russia it should be of great importance to solve the problem of the multiplier effect of budgetary investment in public infrastructure in the conditions of growing budget deficit, increasing cost of its servicing and the resultant fiscal consolidation. Thus it becomes clear that the stable formal institutional conditions for private investors as to transactional costs, risks, financial parameters could bring the ratio of budget and private financing of public infrastructure PPP-projects to 1 to 3 (Infrastructure Investment Analytical Review, 2018).

The contributions of this paper are as follows. The methodology section presents a revision of the investigations dealing with characteristics of formal and informal institutions, ensuring the optimization of PPP in the public infrastructure.

Section 2 discusses the methodology of modeling the substitution of budget funds by private investment in public infrastructure PPP-projects, including the essence of the category of PPP from the institutional economic theory. Among numerous organizational forms it has been proven the acceptability of hybrid forms of PPP-projects in the sphere of long-run capital-intensive public infrastructure.

Section 3 evaluates the negative and positive impacts of the budget consolidation as well as replacement of budget expenditures by private investments through hybrid organizational forms of PPP' projects in public infrastructure. The obtained estimates demonstrate the possible economic effects of attracting different amounts of private investment per unit of capital budget expenditures through infrastructure PPP projects' realization, which could reduce the negative consequences of fiscal consolidation down to zero or achieve positive return.

Section 4 discusses the conclusion and implications.

2 Methodology

2.1 The essence of the category of PPP: institutional attitude

The solution of the problem of extrabudgetary financing of infrastructure PPP projects in the public sector is directly related to the need for macroeconomic assessments of state' activities. The society's assessment of the quality of the state's activities deal with terms of the effectiveness of the state's disposal of the property and assets delegated to it; fulfillment of the functions imputed to him and provision of public goods and services (Alesina, et al 2017).

All participants of PPP enter the complex interactions or "alliances" with one another, that can be characterized from the viewpoint of partnership or cooperation. The private interests are determined by the desire to maximize profits, or market share, or cost of a public company, or others. As to the state, its aim is to save budgetary funds, as well as to increase the quantity and to improve the quality of public goods, financed from the budgetary funds (Batini, 2014).

Using the structural approach to interpretation of the numerous forms of exchange institutionalization in general, three basic groups have been identified: the market forms, the firms (or hierarchies), and hybrid agreements. These organizational forms institutionalize virtually all the transactions in a market economy, including these that occur between public and private sectors. Agreeing with R.A. Posner's position, any decision taken by the state as a regulator must meet the welfare maximization criterion or transaction costs minimization one for the purpose of satisfying the whole society' needs. For these purposes, formal institutions (legal rules), created by the state, should imitate the market: distribute property rights like a market in conditions of zero values of transaction costs, which quite suits economic agents (Posner, 1998). The degree of this ideal situation' implementation is a kind of criterion for assessing the effectiveness of the state as an organizer of hybrid forms of PPP in the sphere of public infrastructure.

2.2 Public infrastructure PPP-projects in Russia and the budget expenditures' efficiency increase

Traditionally, the financing of public infrastructure in the form of PPP projects was carried out mainly at the expense of budgetary funds of authorities of all levels. In the developed countries on average around 15-16% of expenses on fixed assets annually are invested by the budget, the record low figure is in Germany - 10.6%, but much higher than the average level, for example, is invested in less developed Latvia - 19.2%. So Russia in this parameter falls in a general tendency, but up to a point that it lags behind on the development of infrastructure from the countries listed in the chart - France, the United States and Great Britain (Fig. 1).

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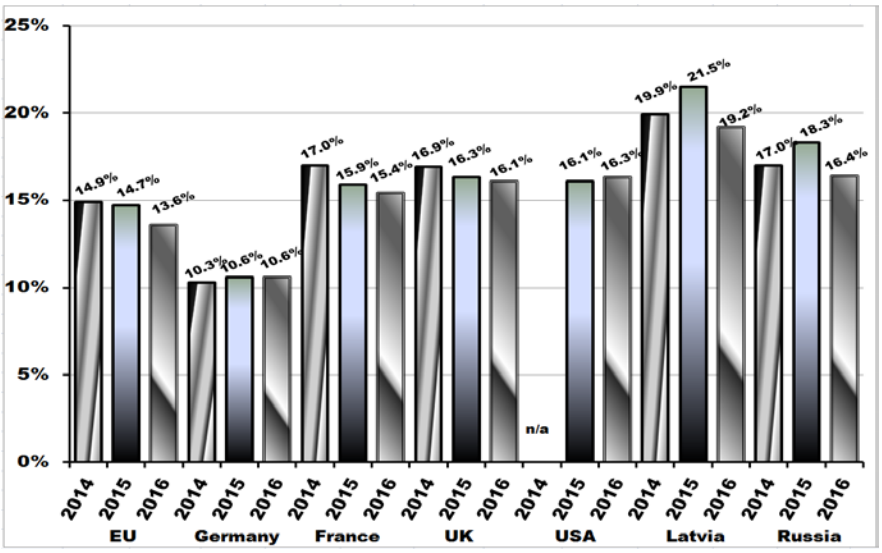

Figure 1. Budget expenditure of some national governments on infrastructure, % of total fixed assets
Sources: Composed on the materials of EU Open Data Portal, World Bank, InfraONE calculations

In order to ensure high rates of economic growth in Russia, the total expenditure on infrastructure should be at least 4-5% of GDP per year (more than 4 trillion rubles) (McKinsey & Company 2013). But for the period 2012 - 2017 years the share of state investments in public infrastructures decreased from 3.7% of GDP to less than 2.4%, respectively. So the budgetary system of the Russian Federation has been showing the record low figures as to public infrastructure PPP-projects' financing at the expense of the budget expenditures (Fig. 2).

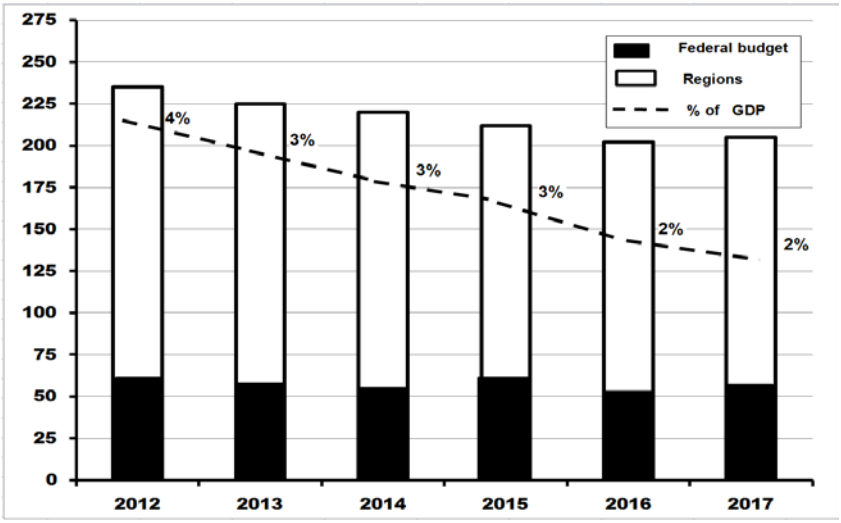

Figure 2. Budget system's expenditures of Russia on infrastructure for the period 2012-2017 (Preliminary estimates), billion rubles
Sources: Composed on the materials of InfraONE, Treasury's data

In conditions when yearly GDP growth rates are planned at 1.5% for the next three years, due to the sanctions against the Russian economy which are likely to remain until the end of the planned period, the unstable revenues of the oil and gas export that form one-third of the federal budget, the government begins to implement the fiscal consolidation program applied to the federal budget for 2018-2020 (Ministry of Finance of the Russian Federation, 2017).

So there should be found the alternatives that could help to realize budgetary consolidation without negative influence on the GDP growth rates. They deal with effective realization of hybrid forms of PPP' organization in the sphere of public infrastructure.

3 Results and discussion

The solution of the problem of large-scale construction and reorganization of the public infrastructure in the country is possible only within the framework of complementary long-term financing of a system, including the resources of the power structures, institutional and private investors. In other words, subject to consolidation of budget funds, the state should change the structure of the financial market institutionalizing the emergence of debt financing segment oriented on public infrastructure PPP projects financing.

In Russia, for example, this situation could be radically changed only after realizing the new mission of the state in the development of public infrastructure: not spending budget funds to finance PPP projects, but attracting private investment with the help of fiscal instruments. Now the ratio of budgetary and extrabudgetary PPP project financing in Russia is 1 to 1. But in perspective this ratio could be changed in favor of private business to 1 to 3. However, the potential size of the Russian financial market for infrastructure PPP projects is much larger and estimated at 2.3 trillion rubles in 2017 (Deryugina, & Vlasov, 2018). More than a quarter of its segment is represented by demand for private investment. According to expert estimates, it is possible to ensure a minimum level of the country's

development by offering at least 300-500 PPP projects of different values within 5-10 forthcoming years with a total cost of all of them at least 6 trillion rubles (Adamchuk, & Papchenkova, 2017).

According to the estimations of InfraONE staff, the use of alternative forms of state support will help to invest additional 0.34-1% of GDP to the infrastructure for three forthcoming years, depending on how actively the authorities work with investors and initiators of projects and stimulate the use of different forms of support within different projects.

In other words, the significance of the Russian state is great as compared with developed countries, which becomes obvious estimating the elasticity' coefficients. To demonstrate the elasticity of GDP in terms federal budget expenditures there have been estimated the dynamics of Russia's GDP growth rates over the period 2000 - 2018 (forecast indicators) as well as correlation with changes in federal budget revenues and expenditures. The federal budget parameters have been chosen because of their dominance in the consolidated budget' revenues and expenditures of the country (Fig. 3). Note, that GDP' dynamics in Russia was investigated within the framework of the trend-seasonal Holt-Winters model (URL).

The changes, shown in Fig. 3, show that the revenues and expenditures of the federal budget vary ambiguously: in current prices their dynamics are multidirectional. Thus, the average parameters of federal budget expenditures fluctuate above the polynomial trend. This tendency indicates a predisposition of the federal budget to an increase of the budget deficit, which justifies the budget consolidation as a government program for the forthcoming 2018-2020 years. At the same time, federal budget revenues change in a more limited range than expenditures for the same periods of time (Sadeghpour et al, 2017).

According to the data of Table 1, the involvement of one additional private ruble could increase the potential of budget expenditures for infrastructure development by 2 times. So if in 2012 the federal budget expenditures for infrastructure were 565.7 billion rubles, this amount could double till 1 179.4 billion in the case of 1 additional ruble attraction of private investment in the same year. (IMF, 2017). The more significant results are given in the third column of Table 1, where the attraction of 3 additional rubles of private investment per one ruble of budget funds in 2012 could increase the whole expenditures for infrastructure development by 4 times till 2358.9 billion rubles the same year without raising budget funds at all.

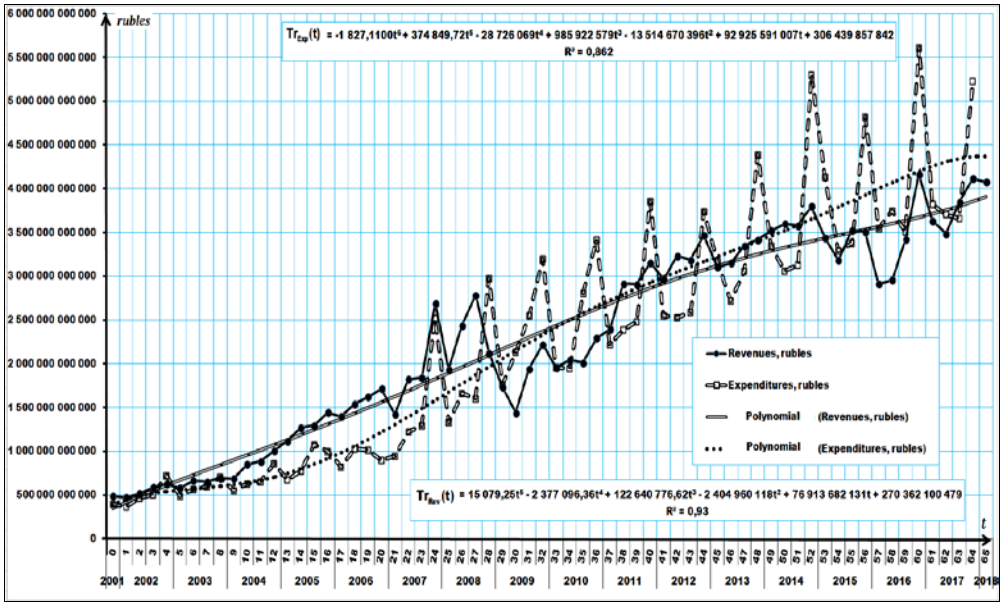

Figure 3. Dynamics and trends of quarterly changes in revenues and expenditures of the federal budget of the Russian Federation for the period of 2001-2018 (in rubles)
Sources: the authors estimations on the base of official data of Rosstat

Table 1. Assessment of the effect of scale obtained from attracting private investments to the ruble of budget funds into the infrastructure projects in current prices (in billion rubles)
Sources: the authors estimations on the base of Rosstat' data

	Year	Everage elasticity of GDP by federal budget' expenditures	Effect of scale of capital expenditures of federal budget, billion rubl.	Effect of scale of capital expenditures of federal budget in the ratio: 1 budget ruble : 1 private ruble (billion rubl.)	Effect of scale of capital expenditures of federal budget in the ratio: 1 budget ruble : 1.5 private rubles (billion rubl.)	Effect of scale of capital expenditures of federal budget in the ratio: 1 budget ruble : 3 private rubles (billion rubl.)
	2012	1,042343	589,716318	1179,432637	1474,290797	2358,865275
	2013	1,042343	571,729627	1143,459255	1429,324068	2286,918509
	2014	1,042343	726,468372	1452,936744	1816,17093	2905,873489
	2015	1,042343	686,652759	1373,305518	1716,631898	2746,611036
	2016	1,042343	628,574590	1257,149181	1571,436476	2514,298362
	2017	1,042343	594,792800	1189,585601	1486,982002	2379,171203
Forecast	2018	1,042343	609,770761	1219,541524	1524,426905	2439,083048
	2019	1,042343	604,559046	1209,118092	1511,397615	2418,236184

On the base of above discussed results (Table 1) it is constructed the regression of the growth rate of GDP by the growth rate of

expenditure which approves the tendencies. Fig. 4 describes dynamics of the economic effect of scale obtained from attracting private investments to the ruble of budget funds into the infrastructure projects in current prices for the period 2012-2020.

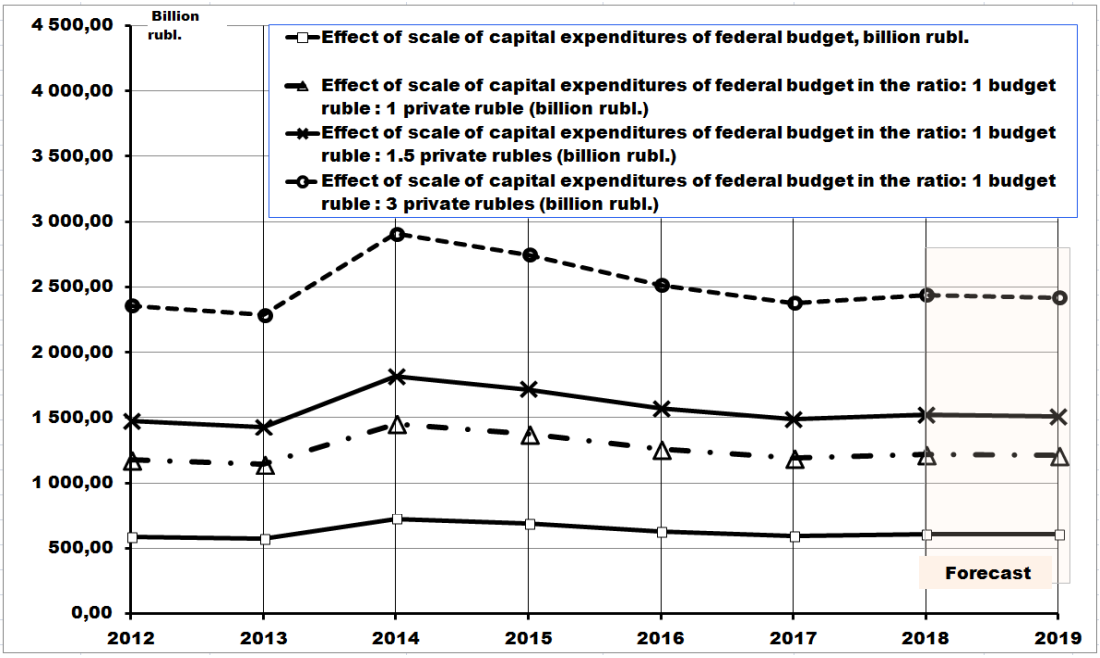

Figure 4. Dynamics of the effect of scale obtained from attracting private investments to the ruble of budget funds into the infrastructure projects in current prices (in billion rubles)
Sources: the authors estimations on the base of Table 1

The economic effect will be much higher than the averaged indicators for the elasticity of GDP by federal budget expenditures. So even in the case of a stagnant economy and fiscal consolidation, the budget expenditure' policy could be extremely effective if the state could increase the effectiveness of its activities as to public infrastructure financing of the properly organized PPP-projects.

4 Conclusion and implications

The public infrastructure projects, being a public goods, have turned out to be exclusively capital-intensive, requiring long-term investments, controlled by the state. And under certain circumstances, their effective implementation could bring a multiple economic return. The analyses and estimations have proved that modern public infrastructure building and restructuring are the fundamental factor of the Russian economy' accelerated growth (Razavi et al, 2015).

The problem of replacing effectively budgetary funds with private capital in financing public infrastructure PPP-projects, provided that the state offers the necessary administrative and institutional support, has not yet been solved by researchers or practitioners. It can manifest itself only if the government uses budget funds not so much to finance infrastructure projects as to create appropriate conditions for private investors, including institutional players. The latter means primarily the stable formal institutional conditions for private investors, low transactional costs, attractive financial parameters, that could bring the ratio of budget and private financing of public infrastructure PPP-projects to 1: 3. The base of evaluation is data variation of budget and private investment' tables as well as official and private statistics of PPP' infrastructure projects in Russia and all over the world.

Acknowledgements

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