AREAS OF INFLUENCE OF INFRASTRUCTURE DEVELOPMENT ON ECONOMIC GROWTH

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ABSTRACT

To activate the attraction of investments in infrastructure on the basis of public-private partnerships, it is necessary to significantly increase the efficiency of work at all stages - selection and preparation of projects. The purpose of the article is to analyze the direction of the influence of infrastructure development on the economic growth of the national model of the socio-economic system. Influence of infrastructure on long-term economic growth can be carried out in five directions: as a direct factor of production; as an interchangeable element of other factors of production; as an incentive for the accumulation of production factors; as a stimulus to aggregate demand; as an instrument of industrial policy. It is important to form a single mechanism for interdepartmental interaction of all levels of government bodies in the direction of economic development. Including in the direction of public-private partnership: at the stages of the project life cycle within the framework of PPP, starting with initiation, consideration, selection (decision-making), implementation, monitoring, ending with the analysis of results. To form an integrated system of operational management of the regional portfolio of agreements that are under implementation. Formation, based on the strategies of territorial socio-economic development of all levels, a base of lists of objects in relation to which it is planned to conclude PPP agreements and concession agreements.

Key words: infrastructure, investment, competition, public-private partnership, concession, economic growth, market.


1. INTRODUCTION

The Russian economy needs to increase investment in transport, energy, social and municipal infrastructure. The spatial development of the Russian economy has led to an uneven
Areas of Influence of Infrastructure Development on Economic Growth

distribution of infrastructure across the territory. The state of physical and moral deterioration of infrastructure is a serious reason for the slowdown in economic growth. All these negative factors require creating conditions for attracting investment in infrastructure modernization and development.

The creation of a favorable investment environment, infrastructure development, and innovative potential demanded by the market are key factors for the development of economic growth.

In the research of institutional issues of infrastructure development, the articles of such scientists as A. Pesenti [1], P. N. Rosenstein-Rodan [2], P. Samuelson [3], A. hirschman [4] were made, where they stressed that the income of economic entities depends on the state and level of infrastructure development. In his works, u. Rostow [5], H. Singer [6] described the existence of a certain relationship between improving the efficiency of the economy and the amount of targeted investment in infrastructure development, described the mechanisms and tools for the development of infrastructure industries. The works of A. G. Isaev [7], R. M. Nizhegorodtsev, S. M. Nikitenko, E. V. Goosen [8], and V. G. Varnavsky [9] are devoted to the issues of project financing, development of mechanisms for creating and managing infrastructure projects, state programs for infrastructure development, and public-private partnership. Among the scientists who study the problems of infrastructure development, the impact on the rate of economic growth, the efficiency of investment, it should be noted V. B. Kondratiev [10], S. Bougheas, P. Demetriades, T. Mamuneas [11], S. Ledyaev, M. Linden [12], E. A. Kolomak [13], V. G. Varnavsky [14]. Actual problems of development of the infrastructure complex of Russia, including industry aspects, are covered in the works Of L. Tropko [15], I. Shvets, Y.Shvets [16], Y. A. Shcherbanin [17]. Questions of development of the infrastructure complex of Russia within the framework of spatial development are covered in the works of M. p. Komarov [18], P. A. Minakir [19], I. Yu. Shvets, Y.Y. Shvets [20, 21], N. I. Valeakhmetov, A. N. Tsatsulin [22], J. Brotsker, P. Rietveld [23]. Despite the significant contribution of scientists, the globalization processes taking place in the world economy lead to increased competition in international markets, which requires a rethinking of the impact of infrastructure on the pace and stability of economic growth and allows us to interpret the study in a new way.

![Figure 1](image)

*The countries below from the left on the right: China, Europe, Japan, Turkey, Russia, USA

**Red = under construction/planned, blue = existing

Investment in infrastructure is an important prerequisite for sustainable economic growth. According to IMF estimates, in developing countries, an increase in investment by 1
percentage point of GDP leads to an additional increase in output by 0.25% over the next year and up to 0.5% over the next four years (in developed countries, these indicators are 0.4% and 1.5%, respectively).

Investment in infrastructure is a necessary condition for survival in the modern global economy. For example, permanently expanding world trade places a steadily growing demand on transport infrastructure.

Thus, according to OECD estimates, in the future until 2030, the average annual growth rate of air cargo traffic will be 5.9%, and sea container traffic – 6%. The existing infrastructure will not be able to cope with this load without additional investment. That is why in 2003-2012 the length of Railways in the European Union increased by 13 thousand km, India – by 1.4 thousand km, and Japan-by more than 1.5 thousand km. The annual spending of 27 European countries on infrastructure development and support amounts to approximately us $ 46 billion. The length of the European high-speed Railways (HSR) by 2020 it should increase to 21 thousand km (in 2005 it was only 4 thousand km). The world leader in terms of HSR construction is China, where 15 thousand km of HSR have been built in recent years, while about 300 trains are produced annually in China.

Fig. 1 Length of high-speed Railways with a permitted speed of 200 km/h, km (Source: Gazprombank)

In total, the world today invests about 2.5 trillion us dollars annually in the energy, water, transport and telecommunications industries. But despite the substantial amount, investment is not sufficient, and the need for high-quality infrastructure is becoming more urgent. Specialists of the international consulting company McKinsey Global Institute in one of their studies calculated that the global economy needs an average of 3.3 trillion us dollars annually to maintain the planned economic growth rates. At the same time, developing countries should account for about 60% of this investment.

Figure 2

*The countries below from the left to the right: developed Asia, Wester Europe, USA, Africa, India, developing Asia, East, Latin America, East Europe, China.
Red = historical infrastructure spending 2018-2030; blue = historical infrastructure spending 2018-2030
Source: IHS Global Insight, McKinsey Global Institute)

A similar opinion is also expressed by experts from the OECD and the world Bank. The required growth rate of investment in infrastructure (in a broad sense, including telecommunications and electricity), according to OECD experts, should be about 2.5% of global GDP annually. This level is average in the world, and developing countries will have
to invest even more in infrastructure to create and maintain the necessary infrastructure in order to be competitive in the global market.

The World Bank estimates the amount of underinvestment in infrastructure in developing countries at 400-650 billion US dollars annually. The World Bank's recommended infrastructure investment rate of 4-4.5% of GDP for developing economies would increase the economic growth rate of Latin American countries by 2 percentage points per year. Indeed, the infrastructure deficit in developing economies is more acute, which means that the multiplier effect of investment, for example, in the transport industry, will be stronger. For example, according to the World Bank, the high growth rate of investment in infrastructure in Asian countries in the first half of the 2000s allowed them to grow faster by an average of 1.6 percentage points.

In the current economic environment, when national governments are reduced spending, and global economic growth of 2.5% annually according to the World Bank forecasts may become the "new normal", the need to reduce public debt, improve budgets, and, consequently, fiscal consolidation in developed countries slow down the pace of economic growth. According to the IMF calculations, a reduction in government spending by 1% of GDP leads to a reduction in real GDP by more than 0.6%. Interest rates in developed countries are already at minimum levels, and, consequently, monetary policy measures in this situation will not restore economic growth. The best way out of this situation is to invest in infrastructure.

The impact of infrastructure on long-term economic growth can be carried out in five ways:
1. as a direct factor of production;
2. as an interchangeable element of other factors of production;
3. as an incentive to accumulate factors of production;
4. as a stimulus to aggregate demand;
5. as an industrial policy tool.

From research by national Bureau of Economic Research experts, it is known that during a recession, the multiplier effect of public investment in the economy increases to 1-1.5 against 0-0.5 in the period. The World Bank has calculated that investments in infrastructure produce rapid results during the post-crisis recovery of the economy: jobs are created in industry and construction, respectively, employment growth supports the volume of consumption. Short-term increases in demand are followed by long-term multiplicative effects. But multiplicative effects differ in different countries and sectors of the economy.

An example is the experience of China. The Chinese model of economic growth was based on active investment. The average GDP growth rate of 9.9% in 1995-2010 was achieved, among other things, due to the active growth of investment in fixed assets (mainly in infrastructure) by 20-22% per year. Investment peaked in 2009. This year, the volume of investment in the Chinese economy increased by 40% and reached the level of 60% of GDP. This allowed China to survive the global crisis not only with the least losses, but also to demonstrate a strong economic growth rate of 9.2% in 2009. Most of the investment came from formally non-budgetary sources: banks, most of which in China are controlled by the state, were instructed to provide loans and invest in large-scale infrastructure projects, as a result, in 2008-2011, the ratio of the loan portfolio to GDP increased by 40 percentage points, and the main borrowers were large state-owned companies. In the following years, China, fearing the risk of " overheating " the economy, began to reduce the rate of increase in investment in infrastructure (already in 2011, an increase of only 10%). It is worth noting that
the low budget deficit, relatively high rates and stable revenue flow to the budget allow the Chinese economy to return to the stimulus policy if necessary.

China is also an active player in foreign investment markets, including as a major foreign investor in the Russian economy (figure 3).

Figure 3 Top 15 recipient countries of Chinese direct investment in 2005-2018, USD billion (Source: Gazprombank)

*USA, Australia, Canada, Indonesia, Brasil, Great Britain, Kazakhstan, Russia, Nigeria, Saudi Arabia, Venezuela, Iran, Peru, Algeria, Argentina

For Russia, infrastructure development is one of the highest priorities in economic policy. The national economy of our country, in the conditions of differentiated development of regions, needs an effectively functioning infrastructure. The deterioration of infrastructure, as well as the inefficiency of investment, have an adverse impact on the rate of economic growth and the sustainability of this growth.

The Russian economy needs large-scale investments in infrastructure, especially those that could reduce the resource dependence of the economy and contribute to the diversification of production. However, long-term trends, accompanied by capital outflows and the weakening of the ruble, had a negative impact on the Russian economy, as due to the slowdown in the economy, low oil prices and reduced government spending, the volume of investment in infrastructure in 2016 was 12% lower than planned. In connection with the update of the Rosstat methodology for calculating expenditures, there was not such a significant drop, which showed that the budget system's investment in infrastructure fell in nominal and real terms, and their share in GDP fell below 2%. In 2017 and 0.3% in 2018 and 0.2%. The key factors behind the slowdown in infrastructure investment were: the budget deficit; high inflation rates; high interest rates; and the devaluation of the ruble.

Many infrastructure projects involve the purchase of a significant amount of imported equipment that has no comparable domestic counterparts. This is particularly evident, for example, in telecommunications, heat and electricity. Due to the depreciation of the Russian national currency, the cost of purchasing and operating such equipment, expressed in rubles, has increased significantly. The economic benefits of implementing a project with such costs in the current environment may not recoup the investment. In addition, further devaluation and inflation expectations make it less attractive for foreign investors to invest in non-export Russian industries (including infrastructure). If the settlement is made in a foreign currency, the foreign investor will receive a comparable amount of necessary investment in the project and gradually depreciating proceeds from the project. In addition, the increase in internal
Areas of Influence of Infrastructure Development on Economic Growth

Project rates also significantly affected the deterioration of the investment climate. The main investors in Russian infrastructure have always been state and quasi-state institutions, but now the budget does not have the funds necessary to make all the critical capital investments in infrastructure. Without significant investment in infrastructure, the growth rate of the Russian economy will not accelerate, so the tax base in the economy will not increase, and the necessary funds will not appear in the budget. Economic growth in modern conditions is achievable only with large-scale investment in infrastructure. And despite the underperformance of the plan in 2016-2018, the planned volume of investment in infrastructure development in 2016-2020 is 185 billion us dollars.

![Figure 4](http://www.iaeme.com/IJM/index.asp)

**Figure 4** Dynamics of investment in Russia's infrastructure and investment needs for infrastructure development 2014-2020, trillion rubles (Source: Rosstat, Treasury, World Bank)

The government should make every effort to break the vicious circle of "weak economic growth – insufficient investment in infrastructure", but this can only be done if investment projects are effective. One of the tools that the state could use to do this is public-private partnership (PPP).

Public-private partnerships are currently considered one of the most effective methods of attracting investment in infrastructure around the world. This is the method of financing that many countries are focusing on in the hope that private capital in large-scale infrastructure projects will follow the state.

The main advantage of public-private partnerships in comparison with traditional budget investments in infrastructure is the supposed higher efficiency of private investment. Private investors take on some of the risks and have a specific motivation to avoid them, as this will directly affect their profitability. In the case of budget financing of infrastructure projects, such motivation is often absent, and the mechanisms for its creation are difficult to implement in practice.

Due to the lack of knowledge of the problems of financing PPP projects in the economic literature, the greatest difficulty for private partners and investors in practice is the question: how to structure financing and minimize the cost of capital in PPP projects. Structuring public-private partnership financing is not just a technical issue, it is something that supports the delicate balance of interests and comparative advantages of various partners in PPP. This is not only a question of optimal allocation of various risks of an infrastructure project, but also a question of creating the right management structure to ensure the sustainability of the project. Given the nature of public goods (which include most infrastructure), in most public-
private partnership projects, the main difficulty is to find a way to internalize the positive externalities produced by the project without overly excluding all potential project beneficiaries.

The institutional context is changing, evolving with time and technological progress. But there is a global historical experience of implementing public-private infrastructure projects, which is a source of models for structuring and modern PPP projects.

Well-designed public-private partnership projects can better leverage the comparative advantages of different partners in generating revenue to Finance infrastructure construction and operation.

When using public-private partnership as a form of interaction between the state and business to solve socially significant problems, a number of serious questions arise. Often, the private partner in a public-private partnership project opposes concession agreements in which future fee revenue is sent to the operator. But this is only one of the tasks of financial structuring of public-private partnership. Another question: how senior should the private investor be in the repayment hierarchy: should private investors be secured creditors, holders of subordinated bonds or ordinary shares (shareholders)? If they are creditors, to what extent is this debt guaranteed and by whom? What control rights do private investors have and what is their protection against the risk of project suspension?

In the world practice of implementing investments in infrastructure projects, there is a steady trend when investors consider them as debt instruments, preferably secured and in relatively safe infrastructure facilities. Private infrastructure investors are mostly focused on relatively safe infrastructure brownfield assets (projects that are already built and operated) and the income rate in which is no longer as attractive. Far fewer investors are willing to take risks and invest in Greenfield infrastructure projects (projects that are still under development) that expose them to construction risks, as well as regulatory and demand risks, and involve much longer payback periods. For routine transport and energy infrastructure projects, the construction risk is usually limited, but the demand and regulatory risk is not. For more unusual infrastructure investments, such as nuclear reactors, long tunnels, or large urban redevelopment projects, the construction risks are quite significant.

Despite the obvious need to attract private investment in infrastructure, there are a number of significant obstacles to attracting such investment in Russia. During 2013-2016, SOPS conducted research surveys among representatives of companies and government agencies responsible for decision-making and with experience in implementing infrastructure projects in Russia. The key points in the study were the current state of infrastructure investment in Russia and opportunities for further development, as well as consideration of the best practices of different countries in the implementation of infrastructure projects.

As a result of the study, it was found that the trends over these years were stable. The main obstacles that were identified as a result of the data analysis were that attracting private investors to infrastructure projects is hindered by uncertainty, insufficient guarantees of return on investment, uncompetitive conditions for selecting infrastructure project performers, lack of a clear and detailed infrastructure development strategy and, as a result, lack of understanding of the prospects for such investments, lack of transparency in the decision-making process for project implementation; the shortcomings of the legislative base is insufficient synchronization between regional strategy or policy and Federal programs. Thus, the main constraints on the growth of private investment in Russia's infrastructure are institutional constraints.

In 2005, Russia adopted the Federal law on concessions. In 2014-2015, amendments to the law on the securities market and the law on concessions were adopted, which expand the opportunities for financing investment projects, thereby increasing the attractiveness of
Areas of Influence of Infrastructure Development on Economic Growth

investments for private partners, which should have contributed to the development of project financing. Insufficient development of the regulatory framework for PPP development and a systematic approach to the formation of such a framework hindered the full development of public-private partnership in Russia. In the absence of a law on public-private partnership at the Federal level, some subjects of the Russian Federation have adopted their own laws. Their mass approval became one of the trends in 2010-2011, but almost all regional laws followed the path of listing the maximum number of mechanisms for private partner participation in economic activities that somehow intersected with the state, which became the main problem of such acts.

The solution to the problems of legal regulation of public-private partnership at the Federal level can be considered the adoption in 2015. Federal law No. 224-FZ" on public-private partnership, municipal-private partnership in the Russian Federation and on amendments to certain legislative acts of the Russian Federation " dated 13.07.2015. The purpose of this law is not only to define the General rules and conceptual framework for the implementation of public-private partnership projects in Russia, but also to become a means of solving infrastructure problems in the country as a whole and regions in particular. The PPP law is designed to regulate a narrower group of relationships compared to the Federal law on concessions. The law on public-private partnership applies to an exhaustive list of objects, which excludes some housing and utilities, social security and social housing, agricultural facilities (except for reclamation systems and their objects), non-state security, the criminal correctional system, and others. The list of possible objects includes those for which the conclusion of a concession agreement is impossible, but they can still be objects of PPP agreements.

The law provides for mechanisms that will increase the ability of participants to structure projects and create an alternative to a concession. One of these mechanisms is the right of private ownership of the created objects, which is a mandatory element of the PPP agreement, together with the obligations of the private partner to create infrastructure facilities, their operation or maintenance, and full or partial financing during the construction phase; also view the introduction of economic evaluation (cost-effectiveness and socio-economic impact) and the comparative advantages of public-private partnership projects as a verification of whether or not the use of the budget(s) for the project to have an advantage over the use of budget funds for implementation of similar state contract.

But despite the opportunities provided by the law, a number of problems remain unresolved. In recent years, the interest profile of foreign investors in Russian infrastructure projects is falling and this is not only unfavorable investment climate and the existing political situation, but also abuses by the authorities in the implementation of PPP projects, concerning the transfer of state and municipal property to the private partners of the agreement through various illegal schemes to meet the vested interests of certain groups, opacity and "determinism" of tendering procedures.

The experience of participating in such contests with a predetermined outcome forces many investors to no longer spend time and money on them. One of the ways to solve this problem is to introduce maximum transparency of PPP projects, which implies, among other things, strong public control over budget spending. It is also necessary to finalize certain provisions of the Law, in terms of restrictions on participation in projects as a private partner of foreign legal entities and companies under state control, which appear to be unfounded and do not correspond to the best international practice. There is no approach to managing the lifecycle of infrastructure projects, which includes: project selection; project preparation and structuring; project implementation; and monitoring the effectiveness of implementation.
In order to increase the attraction of investment in infrastructure based on public-private partnership, it is necessary to significantly improve the efficiency of work at all stages – the selection and preparation of projects. To improve the quality of project development and support, it is necessary to create "project offices". In order to create a stable pipeline of projects financed under PPP, it is necessary to make more active use of this mechanism at both the regional and Federal levels. This will expand the expert base and improve the efficiency of project selection and preparation, including by improving the necessary level of skills in the field.

It is important to create a unified mechanism for interdepartmental interaction at all levels of government at the stages of the project life cycle within the framework of PPP, starting with the initiation, review, selection (decision-making), implementation, monitoring, and ending with the analysis of results. Create a comprehensive system for operational management of the regional portfolio of agreements currently under implementation. Formation of a database of objects for which it is planned to conclude PPP agreements and concession agreements based on strategies for territorial socio-economic development at all levels.

In Russia, there is a significant imbalance in the number of PPP projects in various industries in some infrastructure sectors (for example, Railways, ports, airports, inland waterways and municipal infrastructure), and there is still a shortage of projects based on public-private partnerships. A good practice for the Federal government would be to develop recommendations based on best practices in implementing projects based on public-private partnerships, taking into account the interests of the private sector. It is also necessary to continue working out the relevant legal framework.

REFERENCES

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