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PUBLIC-PRIVATE PARTNERSHIP FOR THE DEVELOPMENT OF INFRASTRUCTURE INDUSTRIES: EUROPEAN EXPERIENCE OF STRENGTHENING NATIONAL ECONOMIC SECURITY

Economic security is a prerequisite for the stable development of any country; it is partially reflected in GDP *per capita*, employment, and unemployment rates. The purpose of this study is to determine the impact of investments for the development of infrastructure facilities on the basis of public-private partnership (PPP) on the economic security of a country. The analysis uses official data from the European Investment Bank and the Statistical Office of the European Union. The article concludes that there is a high correlation between accumulated investment in infrastructure and GDP *per capita*, employment, and unemployment. On this basis, it is reasonable to consider infrastructure development policy as important not only for national but also for economic security. Developing infrastructure facilities by attracting private investment can reduce pressure on national budgets and accelerate the implementation of capital-intensive projects.

Keywords: public-private partnership, infrastructure, indicator, economic security, investment, project.

1. INTRODUCTION

One of the main functions of the state, realization of which depends on the existing external and internal conditions, is economic security. Economic security means the protection of the national interests of the state in the local and international context, the ability of government institutions to protect the development of the national economy, maintain and restore the process of social reproduction, ensure sufficient military potential and socio-political stability of society (Kahler, 2004). A prerequisite for the country's economic security is the investments in the development of infrastructure sectors of the national economy and their efficient functioning (Böhme, Nowey, 2008).

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A number of infrastructure sectors are strategically important, as they create a prerequisite for economic security. They are transport, production of the energy, communal services, healthcare, education. Governments has to find trade-off between market pricing mechanisms, social politics and responsibility for the national economy security.

In most of cases the projects related to the development of certain infrastructure projects related to the development of certain infrastructure sectors (e.g., transport, energy, housing and utilities, etc.) are capital-intensive. Maintaining existing facilities and creating new ones in these sectors in the face of limited budgets is a challenge. This has prompted countries to look for new tools to find investment that will not be additional financial burden for the government. One such tool is the attraction of private investment by governments on the basis of public-private partnerships (PPP).

Partnerships between the state and private business involve not only the pooling of resources and competencies, but also the distribution split of responsibilities, revenues, and risks associated with the implementation of project. Sometimes the implementation of PPP projects requires the government to create prerequisites for a partnership with a private investor in a sector that previously served exclusively state interests.

As practice shows, in some cases attracting private investor can accelerate the implementation of capital-intensive projects with high social significance, reduce country's budget expenses, and increase employment level and business activity in the sector. These indicators partly reflect the country's economic security level (Ward, 1998).

In the following text we discuss the impact of infrastructure projects based on PPP to the economic security indicators in European countries.

The purpose of the study is to find out the impact of investments, in particular on the basis of PPP, in infrastructure industries on indicators of economic security of the country.

The text consists of three parts. In the first part, based on the literature review, a platform of modern understanding of the economic security of the country and the indicators by which it is evaluated is formed. In the second part, according to the data of the European Investment Bank, the analysis of the experience of implementing infrastructure projects on the basis of PPP is presented. It is shown that PPPs are an important factor in the activation of private investments in the implementation of capital-intensive and time-consuming projects in infrastructure sectors. National PPP projects are more successful where the institutional environment (in particular, legal) is more developed. In the third part, a model of the dependence between investments in infrastructure industries and the value of GDP per capita was proposed. There is a strong relationship between studied indicators.

The paper closes with the conclusions of the study and promising directions for research on public-private partnerships in European countries.

2. RESEARCH METHODS

The study used methods mentioned below. The monographic method was used to formulate our point of view that based on the study of experience of implementing PPP projects, country' security reports and scientific literature.

Based on data from the European Investment Bank, we study PPP investment practices that have been completed in the EU-27, Great Britain, Turkey and the countries of the Western Balkans (Albania, Bosnia and Herzegovina, North Macedonia, Kosovo, Montenegro and Serbia). Budget of all these projects was at least 10 million euros.

The case study also used data from the Statistical Office of the European Union. Approximation was used to model the relationship between accumulated investments in infrastructure (independent variable) and GDP *per capita*, number of employed persons, and unemployment rate in European countries (dependent variables).

3. ECONOMIC SECURITY OF THE COUNTRY AND ITS INDICATORS

A reliable and efficient system of economic security is a prerequisite for stable and sustainable socio-economic development of a country and protection of its independence. In general, the country's security is formed at several levels: 1) international (global, regional) (Gbur, 2018); 2) national (state); 3) sectoral/meso level (sector, enterprises, financial institutions); 4) social (households, individuals). Among them the economic security of the country is most important for the the national security (Sytnyk, Blakyta, Huliayeva, 2020).

In turn, the economic security of a country is in the environment of number of interrelated elements: economic security of a region, industry, enterprise, financial sector, society, and an individual. The interaction of these elements can be represented as an open system since each of them has external connections that may be stronger than internal ones (Figure 1).

Economic security is understood as a qualitative characteristic of the economic system that determines its ability to maintain normal conditions of the system's performance, development within the framework of the goals set for the system, and in the event of various threats (external and internal), a system that is able to withstand them and restore its performance (Epifanov, Plastun, Dombrovsky, Bolgar, Vashchenko, 2009). Here it is worth adding that such qualitative characteristic must have clear rational base, main part of which are quantitative assessments.

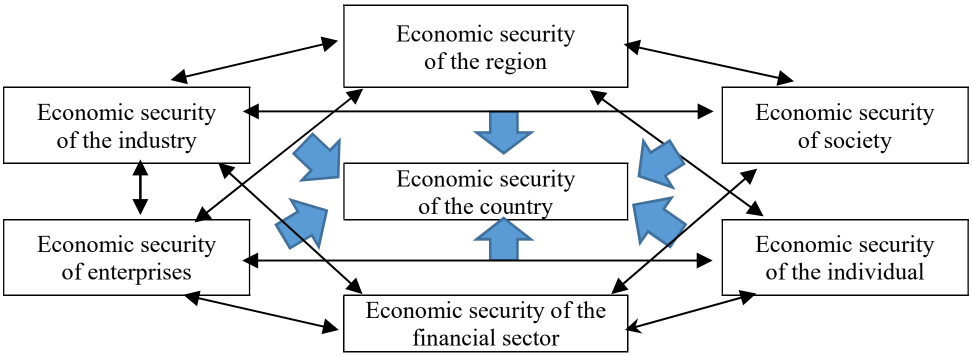

Figure 1. The system of economic security of the state

Source: (Kahler, 2004; Böhme, Nowey, 2008; Gbur, 2018; Solomina, 2018; Sytnyk, Blakita, Gulyayeva, 2020).

The main qualitative characteristics of the country's economic security are:

1. Economic independence, e.g., the ability to manage national resources, the ability to use national competitive advantages to ensure equal participation in international competition;

2. Sustainability of the national economy, e.g., protection of all forms of ownership, creation of guarantees for effective business activity, reducing of destabilising factors;
3. The ability to self-development and progress, i.e. the ability to independently implement and protect national economic interests, to carry out continuous modernisation of production, effective investment and innovation policy, to develop the intellectual and labour potential of the country (Kharazishvili, Dron, 2014).
4. Economic security is reflected in the following indicators: generalised labour productivity (GDP *per capita*), GDP growth rate, indicators of production technology, level of shadow economic, economic openness ratio, levels of export and import dependence, level of investment, growth of foreign direct investment, level of fixed assets renewal, ratio of average wage to living wage, level of shadow employment, indicators of natural population growth, level of monetisation of economic assets, level of economic activity, etc. Some of these indicators characterise the socio-economic well-being of the country's population. (Gbur, 2018).

Socio-economic well-being among other things is based on the development of transport infrastructure and level of the perceived quality of transport services, provision of acceptable living conditions through the development of housing and communal services, medical care system, education conditions, etc. In the context of economic security it means that achieving the target indicators requires a modern production forces and infrastructure. Some European cases show that PPP are an effective tool for ensuring the development of infrastructure sectors (Verweij, 2015; Festa et. al., 2016; Revoltella, Brutscher, 2017; Iossa, Saussier, 2018; Inderst, 2020; Cruz, Sarmento, 2022; Fleta-Asín, Muñoz, 2023).

4. PUBLIC-PRIVATE PARTNERSHIP IN EUROPEAN COUNTRIES

Joint of the public and private sectors can works on solving social important and industrial projects. In this context the following terms define the specifics of partnership between the state and private business (Bondar, 2014):

Private Participation in Infrastructure (PPI) is a term used by the World Bank;

Private Sector Participation (PSP) is a term used by international financial institutions within the development lending sector;

Private Finance Initiative (PFI), which was originally developed in the United Kingdom and then actively used in Japan and Malaysia;

P3 is a term used in North America;

Privately Financed Projects (PFP) – a term used in Australia.

The success of implementing infrastructure projects based on PPPs depends, first of all, on the level of development of the institutional (including legal) environment in the country. The experience of partnership between the state and private business, which exists in a certain country, is of great importance when implementing PPPs.

Today, European countries have the most experience in implementing infrastructure projects based on PPP. Figure 2 shows the dynamics of the number of infrastructure projects implemented in European countries in 1990–2022 with support of the European Investment Bank.

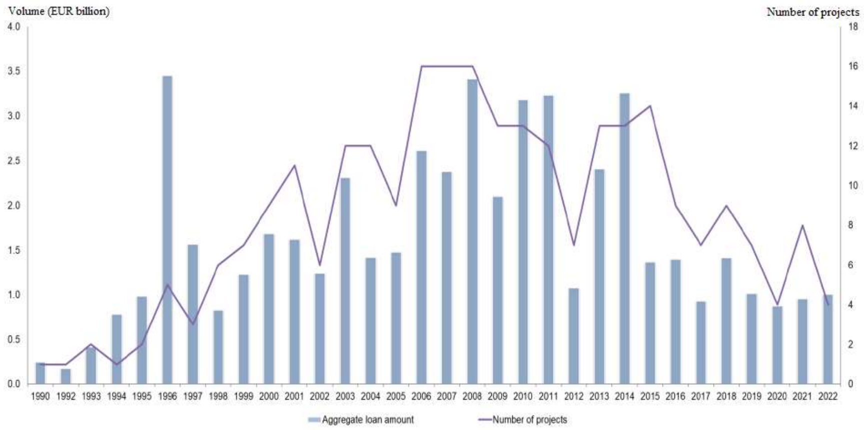

Figure 2. Investment volumes and number of infrastructure projects based on public-private partnerships in current prices

Source: (Public-private partnerships financed by the European Investment Bank from 1990 to 2022).

The largest number of projects and amounts of invested capital were observed in 1996, 2008, 2010, 2011, and 2014. The downward trend in activity stopped in 2017–2018. Since 2018, it has continued again due to the saturation of society's needs for infrastructure services. A decline in investment and the number of PPP projects is also observed in 2019––2022. Decline of economic in Europe was caused by the COVID-19 pandemia and Russia's military aggression against Ukraine. In 2022 Due to the war in Ukraine, the defense sector for the first time took second place after transport in terms of investment (Figure 3).

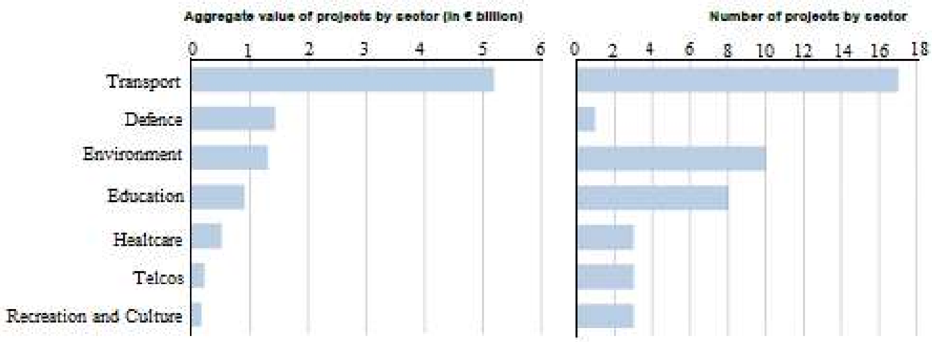

Figure 3. Distribution of economy sectors by aggregate value of projects and number of public-private partnership projects in 2022

Source: (Market Update. Review of the European PPP Market in 2023).

In 2022, 45 PPP deals reached financial close with a total value of €9.9 billion. Compared to 2021, the PPP market increased by 17% in value terms. The number of projects increased by 2%. This means that projects become more expensive.

Investments in the transport sector totalled €5.2 billion in 2022, compared to €6.0 billion in 2021. But, at the same time, the number of projects also increased (17 projects in 2022 compared to 16 projects in 2021). These included four road construction projects (two in France, one in Greece and one in Italy) and four port expansion projects (two in France, one in Croatia and one in Cyprus). That is, projects become smaller.

The transport sector has remained consistently popular with investors (Figure 4). The total amount of invested capital in 1990–2022 was almost €40 billion (€39,938 million). Education and healthcare are in second and third place, with investment volumes of €4.5 billion and €6.5 billion respectively.

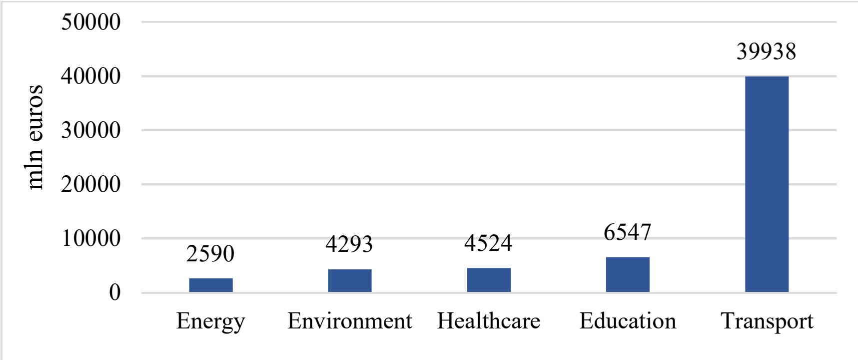

Figure 4. Distribution of PPP investments by sector (1990–2022)

Source: Own study based on: (Public-private partnerships financed by the European Investment Bank from 1990 to 2022).

A study of the practice of implementing infrastructure projects on the basis of PPPs by country in 2022 shows that France, Turkey, Cyprus, Ireland, Germany, Italy, Greece, Poland, Belgium, and the United Kingdom are the most active (Figure 5). 15 countries closed at least one PPP project. In 2021, there were 14 such cases.

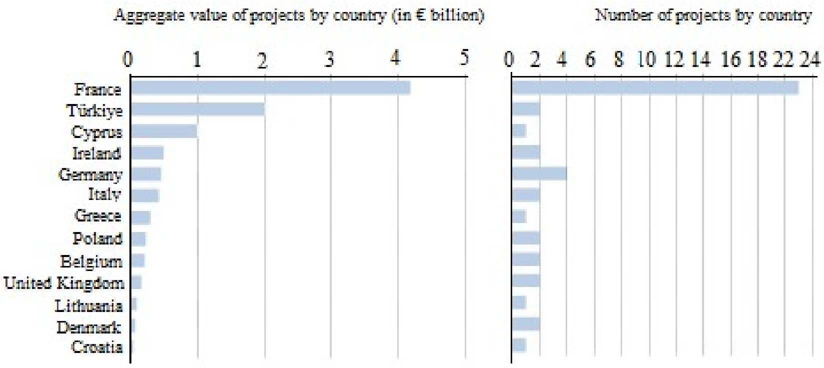

Figure 5. Distribution of countries by aggregate value of projects and number of projects in 2022

Source: (Market Update. Review of the European PPP Market in 2023).

In 2022, three major deals were concluded. Their total value was €4.25 billion, which is 44% of the total value of PPP deals in Europe. These are: Antalya Airport Concession (Turkey) – €1.8 billion; CEGELOG French Military Accommodation PPP (France) – €1.4 billion; Larnaca Port and Marina Area Redevelopment PPP (Cyprus) – €1.0 billion.

The list of leaders is somewhat different in terms of the number of deals concluded. France remains in first place (21 projects), Germany is second (4 projects), and seven countries with two projects each (Turkey, Ireland, Italy, Greece, Poland, Belgium, Denmark) are in third place.

5. THE RELATIONSHIP BETWEEN INVESTMENT IN INFRASTRUCTURE AND ECONOMIC SECURITY INDICATORS OF THE EU COUNTRIES

Given the lag between investment and their effect after, we analyse the dynamics of the average GDP per capita in current prices in accordance with the accumulated volumes of investments in infrastructure facilities on the basis of PPP (Figure 6). As can be seen, there is a high correlation between these indicators (0.9).

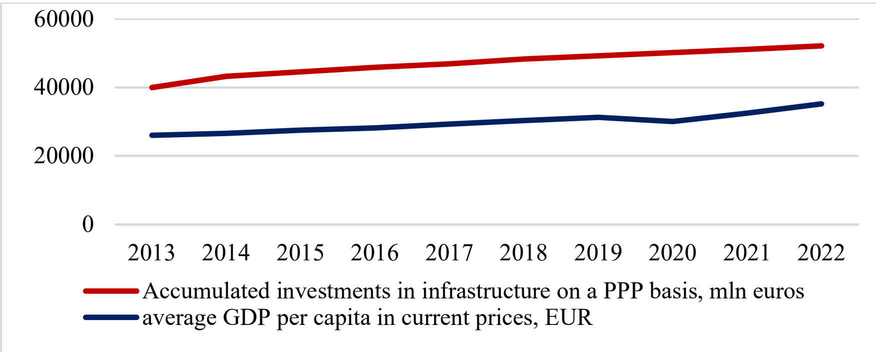

Figure 6. Dynamics of accumulated investments in infrastructure on the basis of PPPs and GDP *per capita* in the EU (2013–2021)

Source: Own study based on: (https://ec.europa.eu/eurostat [Access: 14.04.2023]).

The exponential function best reflects the dependence of average GDP *per capita* in current prices on accumulated investment in infrastructure based on PPPs (Figure 7).

It can be seen that investments made in infrastructure facilities, in particular on the basis of PPPs, have a direct impact on the average GDP *per capita* at current prices. Probably the services provided by new infrastructure facilities to society increase the added value created in the country's economy. Moreover, the accumulation of investments in infrastructure facilities creates new jobs. This has a positive impact on employment level.

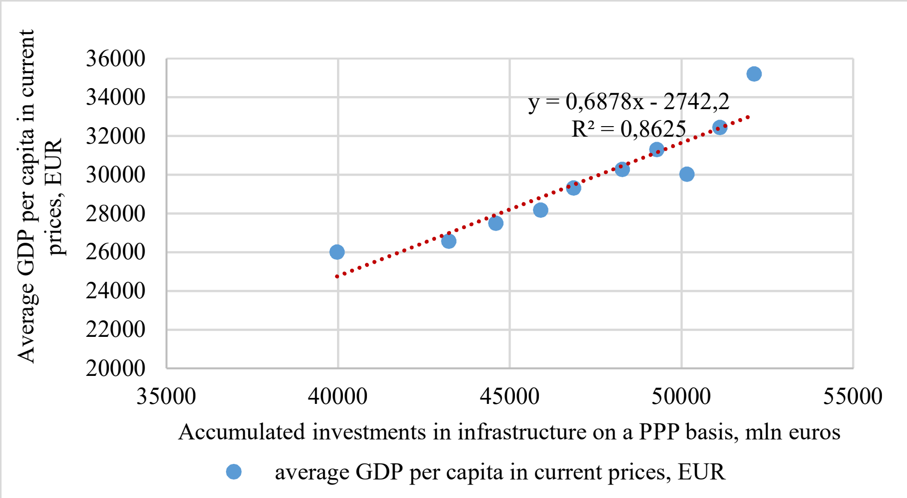

Figure 7. Dependence of average GDP *per capita* in EU countries in current prices on accumulated PPP-based infrastructure investment

Source: Own study based on: (https://ec.europa.eu/eurostat [Access: 14.04.2023]).

Figure 8 shows the dependence of the number of employed people in the EU countries on the amount of accumulated investment in infrastructure facilities. There is a direct, close relationship. It is best described by an exponential relationship.

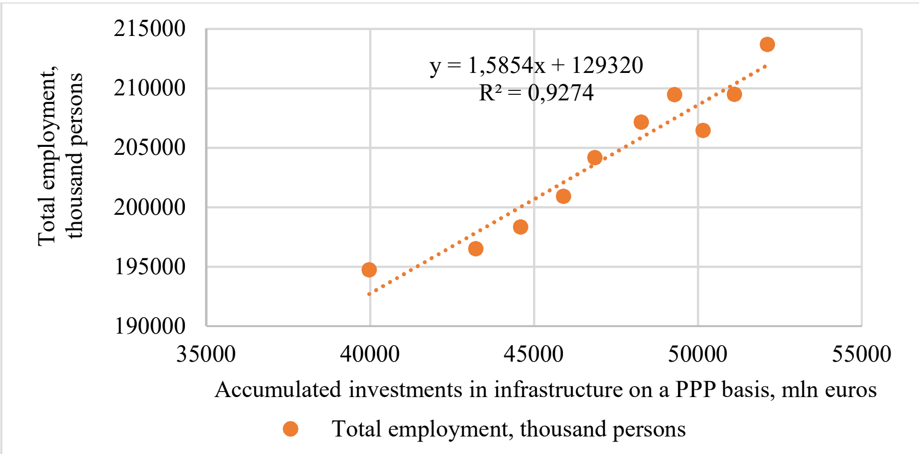

Figure 8. Dependence of total employment in EU countries at current prices on accumulated investments in infrastructure based on PPP

Source: Own study based on: (https://ec.europa.eu/eurostat [Access: 15.04.2023]).

Figure 9 shows the relationship between the unemployment rate and accumulated PPP-based infrastructure investment. The relationship between unemployment and accumulated investment in infrastructure based on PPPs is best described by a polynomial function. The relationship is close and inverse.

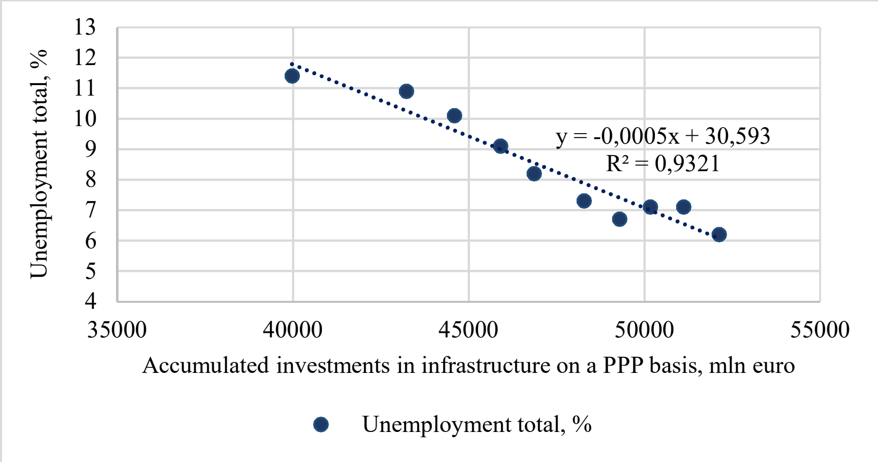

Figure 9. Dependence of the unemployment rate on accumulated investments in infrastructure based on PPPs.

Source: Own study based on: (https://ec.europa.eu/eurostat [Access: 15.04.2023]).

The percentage of unemployed among the active population decreases with the growth of accumulated investments in infrastructure. This is because business activity is increasing in the areas where infrastructure facilities are located, freight traffic is growing, local communities are developing. Unemployment is decreasing because: new jobs are created at the facilities where the investment was made; mobility (if it is transport) increases, so access to work improves. Productive capacity improves due to increased competition for jobs. Uninteresting work is done because of easier access to it (its attractiveness increases)

6. CONCLUSIONS AND DIRECTIONS OF FURTHER RESEARCHES

In summary, the results of the study on the direct impact of PPP investments in infrastructure on certain indicators of the country's economic security demonstrate the importance of a sound infrastructure policy. Such projects should be implemented, first of all, in areas that have certain delays in socio-economic development.

Countries with a high level of economic security include Luxembourg, Norway, Switzerland, Austria, the United Kingdom, Germany, Ireland, the Netherlands, Sweden, Denmark, Belgium, France, Italy, Spain, and Poland. These countries have considerable experience in developing infrastructure projects based on public-private partnerships. The projects relate to the development of transport infrastructure (roads, bridges, tunnels, sea and river ports, urban transport, airports, railways, railway stations, rolling stock), housing and utilities (gas and water supply, energy saving, construction of affordable housing), education, healthcare, law enforcement, environmental protection, tourist destinations, etc. Investments in transport development projects have the greatest impact on strengthening economic security.

In order to save budgetary funds and accelerate the implementation of socially important projects, it is important to attract private investment. This involves the creation of attractive conditions for private investors by governments. The study of the prerequisites for private investors to come to infrastructure projects and the study of the practice of creating such prerequisites in the EU countries is the focus of further research.

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