Analysis of the development of public-private partnership under the conditions of implementation of economic projects

Análisis del desarrollo de la asociación público-privada en las condiciones de implementación de proyectos económicos

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Abstract
The basic goal of the state is to ensure a decent, stable and adequate standard of living for its citizens. In order to do this, the state forms a policy of development of various spheres and sectors of the economy. However, due to limited financial resources, the state is forced to seek new sources of economic projects in the country such as a platform for sustainable development of infrastructure, transport, energy and other industries. The purpose of the academic paper: investigation of advantages and disadvantages of PPP (public and private partnership) economic projects and analysis of key trends and sectoral direction of PPP development in different regions of the world. Results. According to the results of the study, the advantages and disadvantages of PPP economic projects have been summarized. Advantages are as follows: organizational advantages for public authorities; possibility of high-quality project implementation and clear control by the state. Disadvantages are as follows: the difficulty of determining the feasibility of PPP; excessive burden on the private sector; different profitability of PPP projects; high cost for the state; the complexity of forecasting economic benefits in the future; possible inefficient project management by private owners. It has been revealed that in recent years (2000-2020) the number and cost of PPP projects in European countries is declining (and is projected to remain unchanged). On the other hand, in countries with budget deficits and significant public debt, they are increasing (the Asian, the Pacific regions, including Vietnam, Malaysia, Indonesia, Thailand and the Philippines). Distinct priority branches and spheres of PPP (energy, transport and infrastructure development) in different regions of the world have been established and identified, namely: European region - projects in the field of green energy (approx. 65%) and
transport (approx. 15%); the Asian and the Pacific - transport projects (approx. 30%), energy (approx. 30%), infrastructure (approx. 17%), healthcare (approx. 17%); African region - transport projects (approx. 30%), energy (approx. 27%), infrastructure (25%).

Keywords: Public-Private Partnership (PPP), Economic Projects, Structure of Public-Private Partnership, Transport, Infrastructure, Energy, PPP Shortcomings (Disadvantages).

Resumen

El objetivo básico del estado es garantizar un nivel de vida digno, estable y adecuado para sus ciudadanos. Para ello, el Estado forma una política de desarrollo de diversas esferas y sectores de la economía. Sin embargo, debido a los limitados recursos financieros, el estado se ve obligado a buscar nuevas fuentes de proyectos económicos en el país, como una plataforma para el desarrollo sostenible de infraestructura, transporte, energía y otras industrias. El propósito del artículo académico: investigación de las ventajas y desventajas de los proyectos económicos de APP (asociaciones públicas y privadas) y análisis de las tendencias clave y la dirección sectorial del desarrollo de APP en diferentes regiones del mundo. Resultados. Según los resultados del estudio, se han resumido las ventajas y desventajas de los proyectos económicos de APP. Las ventajas son las siguientes: ventajas organizativas para las autoridades públicas; posibilidad de ejecución de proyectos de alta calidad y control claro por parte del estado. Las desventajas son las siguientes: la dificultad de determinar la viabilidad de una APP; carga excesiva para el sector privado; diferente rentabilidad de los proyectos de APP; alto costo para el estado; la complejidad de pronosticar los beneficios económicos en el futuro; posible gestión ineficiente del proyecto por parte de propietarios privados. Se ha revelado que en los últimos años (2000-2020) el número y el costo de los proyectos de APP en los países europeos está disminuyendo (y se prevé que no varíe). Por otro lado, en países con déficit presupuestario y una deuda pública significativa, están aumentando (las regiones de Asia, el Pacífico, incluidas Vietnam, Malasia, Indonesia, Tailandia y Filipinas). Se han establecido e identificado distintas ramas y esferas prioritarias de APP (energía, transporte y desarrollo de infraestructura) en diferentes regiones del mundo, a saber: región europea - proyectos en el campo de la energía verde (aprox.65%) y transporte (aprox. 15%); Asia y el Pacífico: proyectos de transporte (aprox. 30%), energía (aprox. 30%), infraestructura (aprox. 17%), asistencia sanitaria (aprox. 17%); Región africana: proyectos de transporte (aprox. 30%), energía (aprox. 27%), infraestructura (25%).

Palabras clave: Asociación Público-Privada (APP), Proyectos Económicos, Estructura de Asociación Público-Privada, Transporte, Infraestructura, Energía, Deficiencias de APP (Desventajas).
Introduction

Progressive long-term development is a key goal of each country, and also serves as an effective indicator of the success of the state's implementation of its policy. So, until recently, there was no theoretical basis for the success of the formation and implementation of public policy. In turn, it contributed to the inaccuracy, uncertainty and inefficiency of policy implementation, especially in developing countries (Mugambwba et al., 2018).

In addition, even before the 1960s, the practice of public policy analysis was mainly limited to assessing the peculiarities of the formation and development of state policy in various spheres of life. However, since the 1970s, due to the low efficiency of policies in many areas, interest has naturally increased not only in the stage of formation of public policy, but also in the peculiarities of its implementation. After all, that most researchers say that the policy can be implemented automatically after its formation but it is not true. It is especially true for Third World countries and some Western countries, where governments tend to form it very broadly and are not able to bring it to the stage of implementation because of government bureaucracy (Smith, 1973). So, it is obvious that the interest in the peculiarities of the implementation of public policy became growing in the last century.

From year to year, the implementation of PPP projects is becoming more popular in order to achieve the goals outlined that would not be achieved by the state and the private sector separately from each other. In particular, reconstruction and creation of state facilities, infrastructure facilities, ensuring high-quality development, development of digital infrastructure, etc. Ideally, public-private partnerships create opportunities for the private sector to work with the government, where they are the first to take responsibility for managing economic projects and much of the risk, in exchange for profits, which usually depend on their performance. Along with this, the implementation of public policy on the use of PPP projects is a source of resources and experience for the public sector, as well as a tool to increase the effectiveness of state policy. The actual situation is that most PPP projects would not be implemented without public sector support, as budget spending optimization happening around the world makes it difficult for governments to fund obsolete government assets and services.

The purpose of the academic paper: to study the advantages and disadvantages of PPP economic projects and analysis of key trends and sectoral direction of PPP development in different regions of the world.

Research objectives:

1. Determining the benefits of implementing PPP projects.
2. Presenting of models (types) of PPP projects implementation and stages of PPP economic projects implementation.
3. Investigation of trends in the development of economic PPP projects in different regions (European, Asian, Pacific, African regions).
4. Analysis of changes in the sectoral structure in the implementation of PPP projects in Europe and identification of promising PPP industries in the future.
5. Generalization of possible shortcomings in the implementation of PPP projects.

Literature review

According to viewpoint of Bhuyan, Jorgensen and Sharma (2010), the implementation of public policy is carried out mainly due to the functioning of coordinated mechanisms, the availability of resources and linkages that connect policy with program actions.

Coleman et al. (2020) studying the features of the implementation of public policy, have noted that its implementation can be most effectively carried out using three models. The models of the first, second and third generations are among them. The main difference between them is the degree of participation of participants in their implementation and the order of distribution of responsibilities. In particular, according to the first generation model, the hierarchy of implementation and distribution of resources is carried out from top to bottom (from the state to the enterprise or institution). The model of the second generation, in turn, provides bottom-up implementation, that is, the quality of implementation depends on the degree of responsibility of companies and individuals involved in the implementation of programs and projects within public policy. The last model, the generation model, involves the use of analysis and coordination of certain actions of performers (the state - the private enterprise – the public) in order to improve the effectiveness of policy implementation. It is this model that is characteristic for public-private partnerships, which are increasingly used as a tool for the effective implementation of economic projects of the state.

Matignon, Louis de Goyon (2019) believes that there is no single approach to defining public-private partnerships. This is primarily due to the fact that the term includes hundreds of long-term
contracts of various types and directions, with a wide range of risk allocation, financing mechanisms and requirements for their transparency. At the same time, the author believes that the development of public-private partnership in the implementation of projects forms a new stage of evolution in public administration.

The peculiarity of the interaction of participants in the framework of public-private partnerships in the implementation of economic projects is confined to the conclusion of an agreement between the government and a private company, a person or a group of persons, the ultimate goal of the implementation of which is to achieve social benefit (Asghari, 2019).

Depending on the functions entrusted to the private partner, the following economic projects are distinguished (Quelin, 2020):

- design - involves the development of the project on the basis of the initial concept and the initial requirements for the design of project specifications;
- construction or restoration - projects are aimed at building a certain asset or its restoration from the available resources of a private company; the responsibility in this case is borne by the private party;
- financing - in this case, the private party is involved in the project as an additional source of material resources to cover part or all of the capital costs;
- support - projects of this type provide support from the private company of the object according to the established standards during all term of the agreement;
- operation (exploitation) – centers around imposing responsibilities on a private company for the maintenance of the facility or asset, which may consist of maintenance, provision of mass services to the public buyer and the direct user, as well as the provision of ancillary services.

At the same time, World Bank experts note that it is extremely difficult for the public sector to implement infrastructure or other capital projects, and that public-private partnerships (PPPs) are the tools by which this can be implemented. After all, it can be used to ensure more efficient public procurement, focus on meeting consumer needs and supporting the implementation of the project life cycle, to carry out quality monitoring of its implementation. According to viewpoint of Kenton (2019), the most common economic projects, implemented on the basis of public-private partnership, are projects in the field of public transport networks, public spaces, creation of parks and convention centers. After all, financing of projects with the help of PPP can allow completing a project faster or make it possible in the first place. At the same time, Sadran (2017) proposes to add social and environmental services to the list of PPP using.

Another author, Rodriguez (2019), notes that public-private partnerships should be used to increase the efficiency of infrastructure projects, as it offers a solution to the problem of funding, job creation and additional investment in large projects, without spending public finances.

From year to year, the number of established divisions and implemented PPP economic projects around the world is increasing. The last country to announce the establishment of a PPP unit at the time of the study is Dubai; its government plans to use public-private partnerships to encourage the development of economic projects and infrastructure initiatives to further attract global investors (Fahy, 2019).

In addition, the use of the public-private partnership model is extremely effective in equalizing the pace of development of individual territories. After all, according to Akimova et al. (2020), the problem of lagging behind the regions in economic and social development has become extremely pronounced in recent decades.

**Data and methods**

The methodological basis of the study is the use of methods of analysis, synthesis, formalization, logical abstraction, theoretical knowledge, systematization, abstract logic and forecasting method in the process of its implementation.

For the purposes of the study, the following indicators have been used, namely: the total cost of public-private partnership projects in the European market for 2010-2019, as well as their number for the same period.

The indicator of financing large projects in the general structure of all projects in the context of the following regions has been studied, namely: European, Asian, Pacific, and African. Countries where investigations have been conducted are as follows: the UK, France, Germany, Belgium, the Netherlands, Serbia, Greece, Ireland and Austria. The sectoral distribution of PPP projects in quantitative and cost terms for 2015-2019 in the European region has been given. Branches selected for analysis are as follows: transport; housing and community; education; environment; general public services; recreation and culture.

**Results of the study**
Implementation of economic projects on the basis of public-private partnership may include the following stages: the conclusion of a contract between the participants (conclusion of the joint-stock agreement between the private company and investors on additional investment from the last means in the project occurs if necessary, as well as attraction of additional credit funds by the private company which is legally executed by the credit agreement). Depending on the type of contract, the second stage is a building contract with a construction company or a commissioning and maintenance contract with relevant contractors or specialized companies in this sphere. If additional financial resources are not required, projects are financed exclusively with the participation of the state and a private company.

The next stage involves the transfer of ownership capital from investors to the company involved in the PPP, as well as the latter settlements with contractors (construction companies or companies for operation and maintenance). In the fourth stage, the return of credit funds or payment of dividends to investors, as well as the return of excess funds received from the state (if any) is carried out. The stage of conducting payments from the state to the private sector does not contain its number, as they can be executed both at the beginning of the project and in the process of its execution. Completion of public-private partnership during the implementation of economic projects can take place at different stages of their implementation, depending on the chosen type of contract.

Herewith, regardless of its location and subordination, the process of implementing economic projects on the basis of public-private partnership has a unified structure and includes several stages, a schematic representation of which is reflected in Figure 1.

![Figure 1. Stages of project implementation using public-private partnership](image)

**Source:** author's own development based on APMG International (2020)

According to the analysis of world experience, the partnership can be formalized in the form of the following organizational forms (Designing Buildings Wiki, 2020):

1. Concession contracts. Here a private company grants a concession on behalf of the government. The company receives a fee from the government (e.g., toll roads).
2. Private Finance Initiatives (PFIs), which impose an obligation on a private company to finance and provide services on behalf of the state (e.g., construction, maintenance and operation). In this case, the payment is received from the relevant
One of the characteristic differences of various PPP economic projects is the transfer of ownership of the asset at the end of the contract, which may take the form of ownership of the objects of the agreement by the state, by a private partner, as well as being owned by a private partner with subsequent transfer to state ownership for a certain period of time.

We propose to consider in practice the dynamics and features of the implementation of economic projects on the basis of PPP in European countries. The management of public-private partnership processes during the implementation of economic...
projects in European region is carried out by the management of the European PPP Expertise Center. This institution operates in close cooperation with the Advisory Services Department of the European Investment Bank. In total, they guide about 42 national units of public-private partnership of EPEC member countries.

For the purposes of the study, we use annual reports published by EPEC based on the results of PPP activities in the European market. The latest report on the results of 2019 is called “Review of the European PPP Market in 2019”. According to this report, we receive information on the dynamics of changes in the cost of PPP projects in Europe over the past decade. Visual display of data obtained from Figure 2.

Thus, we can summarize that the overall trend in the cost of public-private partnership projects was negative. In particular, in 2019, compared to 2018, the cost of PPP projects decreased by 31% (from 14.3 in 2018 to 9.8 in 2019). At the same time, the highest cost of PPP projects is observed in 2013 at 21.0 billion euros, and the lowest in 2019 and 2016, 9.8 and 11.2 billion euros. This is due to the negative impact of economic crises on project implementation.

In addition, we analyze the overall dynamics of change in the number of public-private partnership projects, depicting the current trend with the help of Fig. 3.

So, as we see, the trends in the number of projects are almost identical to the trends in the cost of

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**Figure 2.** Cost of PPP projects for 2010-2019  
**Source:** Author's own development based on European PPP Expertise Center (2020)

**Figure 3.** Number of PPP projects for 2010-2019  
**Source:** Author's own development based on European PPP Expertise Center (2020)
projects. They are declining. The largest number of PPP projects was brought to the financial point in 2010 - 108, and the smallest number in 2019 - 29. So, we see a decrease of almost three times. At the same time, for the period 2013-2014 there is a slight increase in the number of PPP projects, but in 2015 their sharp decline.

In addition, according to the European PPP Expertise Center, the lowest number of transactions in public-private partnership projects since 1996 is monitored in 2019. At the same time, 6 large projects with a total value of about 5.9 billion euros were completed last year. Among them are the following projects:

- Silvertown tunnel - regeneration of the Brentwood area in Great Britain;
- construction of Netz Elbe Spree rolling stock in Germany;
- construction of the A9 motorway in the Netherlands;
- construction of the Tarn-et-Garonne Broadband in France.

Let's show the place of these projects in the general structure of PPP projects in the countries of their realization by Fig. 4.

![Figure 4](image)

**Source:** Author's own development based on European PPP Expertise Center. (2020)

So, analyzing the data shown in the figure, we can see that large PPP projects in the structure of their total cost occupy almost its entire share in the UK, the Netherlands and Germany. At the same time, in Serbia, Greece, Ireland and Austria, where the volume of public-private partnership projects compared to other European countries is quite high, did not implement large-scale projects in 2019, while in France, the construction of broadband range occupied only a quarter of the total number of projects, ¼ all funding was directed to local projects with a relatively low cost.

According to the World Bank report for the first half of 2019, the sectoral focus of economic projects implemented on the basis of PPP in advanced and developing countries is as follows (Figure 5):

![Figure 5](image)

**Source:** WB group H1 2019 Private participation in Infrastructure (2020)

The largest number of projects in advanced and developing countries is implemented in the sphere of energy, which can be observed throughout the study period. Transport sector is the second largest area of PPP use in the implementation of economic projects. Moreover, over the past two years, it has begun to take a leading position in terms of PPP use. Public-private partnership is used least of all in
the implementation of projects in the ICT industry (less than 1% during the entire research period), as well as water & sewerage (from 1 to 3% of all projects in 2010-2019).

For comparison, the sectoral focus of the vast majority of economic projects implemented on the basis of PPP in the European market for the period from 2015 to 2019 is reflected in Figure 6 (Figure 6).

So, according to the data shown in the figures, we can see that the dynamics of change in the number and cost of projects in different industries was ambiguous. In particular, during the study period there was a decrease in PPP projects in the field of education and health care, as well as transport. At the same time, the number of projects in the field of education from the leading position in the number of projects and programs of public-private partnership in 2015-2016 moved to second place in 2019.

In addition, the number of projects in the field of health care decreased significantly and in 2019 it amounted to only 1 project. Moreover, the number of projects in the field of transport had a more stable trend and in 2019 compared to 2015 (the year with the largest number of projects in the field of transport), decreased by only 3.

Trends in the cost of public-private partnership projects have been reversed in proportion to the change in their number. In particular, the largest cost of projects throughout the study period falls on the transport sector. Moreover, funding remained relatively high in 2019. In contrast to transport, funding for education was very low and did not exceed 1.5 billion euros. Funding for health projects during 2015-2017 was at the level of ½ from funding for transport. There is a significant decrease in the cost of projects in 2018, up to a critically low level in 2019.

The detailed structure of the number of PPP projects in 2019 in terms of cost and quantity is reflected in Figure 7.
From above mentioned we can conclude that the transport sector has remained a priority one in the implementation of PPP projects, of which a total of 10 were implemented in 2019 for a total amount of about 6 billion Euros. Education is the next largest sector, where 7 projects for a total amount of 0,9 billion Euros have been implemented as well as housing and communal services (4 projects for a total amount of 1,4 billion Euros). The smallest number of PPP projects was implemented in the field of recreation and culture, defense and general public services - 1 project, respectively, and their cost was less than 0,1 billion Euros.

The trends described above allow us to confirm the thesis that public-private partnership is usually used by countries with budget deficits and significant public debt. In contrast to Europe, a completely different trend is observed for the example of Asia and the Pacific, where according to the United Nations Economic and Social Commission for Asia and the Pacific (ESCAP) and the Asian Development Bank, the number of PPP projects is growing rapidly every year.

Moreover, a wide range of directions for public-private partnerships are being traced in the African region. Only a few countries can be an exception. Africa lags far behind in terms of infrastructure, transport, health and education. These processes in this region take place under the auspices of the Southern African Development Unit (SADC) Public-Private Partnership Network.

The projected volume of economic PPP projects in the regional context, depending on the industry is reflected in Figure 8.
According to the data, we conclude that the main focus of PPP projects in the European region will be directed to energy towards the development of alternative energy sources, as well as transport sector. A small proportion of PPP projects in the near future will focus on health and education. A slightly different structure is being traced in the Asian and the Pacific region, where PPP projects are planned to focus on energy, transport and infrastructure development. In addition, about 15% of all projects will be directed to healthcare. Regarding the African region, the key areas of implementation of economic projects on the basis of PPP will be the transport sector, energy and infrastructure. 11,0% and 6,7%, respectively will be allocated for healthcare and education.

**Discussion**

Based on the study, we can conclude that the limited resources of the state encourage it to look for new ways of implementing its policies in various fields. One such way is to take advantage of public-private partnerships during the implementation of economic projects.

It should be noted that PPP is usually used in the implementation of projects in the field of transport, energy, infrastructure, health and education. Moreover, separate units are created in order to stimulate the development of public-private partnership in the structure of public bodies that operate at the state level, as well as specialized international institutions, which are responsible for coordinating and supporting the development of PPP in its jurisdiction.

As a result of the analysis of the activity of specialized institutes, we came to the conclusion that the volume of public-private partnership in the European market is decreasing every year. At the same time, their direction is also changing. At the same time, PPPs are developing steadily in Asia and Africa, which lags far behind in terms of infrastructure, education, health and transport. In compliance with proposed forecast of trends in the structure of PPP projects in the regional context according to the sectors of the economy, the priorities for Africa and Asia in the future will remain in the direction of transport, infrastructure and energy. A significant share of PPP projects will also concern the health and education sectors, which are currently lagging behind the level monitored in Europe. As for the European region, the priority will be in the energy sector, as well as in part in the transport sector.

Therefore, the Asian and African regions will be the future platform for significant dissemination of the practice of implementing economic projects in countries on the basis of public-private partnership.

However, despite the significant list of advantages of using public-private partnerships for the implementation of economic projects in numerous sectors of the economy, this type of interaction has a number of significant shortcomings. In particular, among them are as follows:

1. According to a study conducted by some analysts, the diversion of resources (financial and labor) from market goals to politically motivated public-private partnerships is holding back growth. In addition, they argue that public goods could be provided much more effectively by the private sector itself, if the effect of displacing public distortions in the capital market doesn’t take place (Investopedia, 2019).
2. PPP poses a significant risk to private firms, creating an overload on them for project failure (Prachi, 2019).
3. Different profitability of projects, depending on...
their complexity, level of competition and connected risk (Chinn, 2019).

4. Taking into consideration that there is no unlimited risk, private companies will be cautious about taking risks that are beyond their control, in particular foreign exchange. If the latter accepts such risks, it will affect the cost of the project (Nandwana, 2018).

5. Increasing government spending due to the risk of participation in projects by private firms, which in turn affects the demand for large compensations by the latter (European Court of Auditors, 2018).

6. A private company will carry out only what it was paid for, no more; that is why incentives and performance requirements must be clearly stated in the contract. Particular attention should be paid to production-based performance requirements that are relatively easy to control (Asghari, 2019).

7. Probable lack of economic benefit, which is difficult to predict when estimating the cost of the project (Chinn, 2019).

8. Significant dependence of the government on the private sector, which may affect the retention of the use of PPP during the implementation of projects (Prachi, 2019).

Conclusions

The research conducted within the framework of this scientific article allows drawing conclusions that public-private partnership is an effective innovative model for the implementation of economic projects in order to stimulate economic development by obtaining access to additional financial resources. These resources can be directed at maximizing the needs of end users, namely the population of a particular country. PPP makes it possible to stimulate the development of infrastructure in the country, transport network, energy, to build and reconstruct strategic facilities for the country, to stimulate the development of education and health care.

In the framework of the scientific study it has been found that the volumes of use of public-private partnerships for the implementation of economic projects differ significantly in various regions, which is connected with the rates of economic growth of countries and the policies within them. In addition, PPP use has been found to be increasing in Asia and Africa over the past few years, while declining in Europe.

However, during the implementation of economic projects a number of shortcomings stand in the way of a steady increase in the use of PPPs in the implementation of public policy. These disadvantages are typical for this type of partnership. In particular, there is high risk for a private company, the possible negative impact of public-private partnership on the economic growth of some countries, the lack of initiative of a private partner. The partner starts acting only when it was paid. In addition, there may be a lack of economic benefits for the state, which is difficult to predict due to the lack of knowledge of government officials, as well as increasing dependence of the state on the private sector, through PPP projects.

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