

“Project finance risk management for public-private partnership”

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PROJECT FINANCE RISK MANAGEMENT FOR PUBLIC- PRIVATE PARTNERSHIP

Abstract

The development of public-private partnership in Ukraine in recent years has become very important as an instrument of anti-crisis orientation. The real economic situation objectively creates the preconditions for more effective use of this mechanism and institutes of public-private partnerships in order to ensure sustainable economic development, obtain new ones and improve the quality of public services provided to the population.

The objective of the research is to identify the components of project finance risk management and to provide justification of effective and balanced sharing of risks between public and private partners as the prerequisite and the main principle of effective implementation of public-private partnership.

The authors used the following research methods: systemic approach, theoretical and empirical methods of scientific knowledge.

This paper examines types of investment project financing by banks based on public-private partnership. It defines the structure of public-private partnership according to sources of capital investment in the project vehicle. The paper identifies components of the risk management process in project finance. It proves that a balanced distribution of risks between the private and public partners is the key requirement and the primary principle of effective public-private partnership. In this way, the need for mobilization of additional financial resources for implementation of investment projects calls for extended cooperation of state agencies and banks as a part of the effort of economic crisis management.

Keywords

bank, financial resources, public-private partnership,
project finance, risk management, investment projects

JEL Classification

D810, D920, G920

INTRODUCTION

Over the past fifteen years, Ukraine has been lagging behind the developed countries by any definition, causing the national economy to lose its competitive edge. All of these effects are primarily due to insufficient funding, completely out of line with the trends prevailing globally. The trend has culminated in the current financial and economic crisis, with one its drivers being negative dynamics of investment demand in the country.

Public-private partnership (PPP) may become one of the main channels to expand financial resources and raise money needed for development of the economy. Public-private partnership provides access to alternative sources of private capital and allows implementation of important and urgent projects, which, otherwise, would be impossible. The business and state relationship system, which exists in Ukraine, stipulates the necessity to form new partnership mechanisms based on the integration of state economy regulation principles directed at

society development aims, tasks and priorities achievement, and business incentives. The potential of public-private partnership, its power and opportunities stipulate consistency, depth and reasoning of society modernization in the direction of knowledge-based economy development, efficiency of measures aimed at creating conditions for innovative and competitive business formation.

1. LITERATURE REVIEW

An important contribution to the study of the features of institutional environment and the implementation of public-private partnership made was by famous scientists, economists and experts, and in particular Akitobi (2007), Varnavskyi (2002), Heiets (2004), Zapatrina (2011), Mitskan (2010), Hemming (2007), Schwartz (2007), etc.

Thus, Zapatrina (2011) emphasizes the uniqueness of the mechanism of PPP, which allows for additional funding and examines the problems of state investment support for the implementation of PPP. Among the Russian works, which are devoted to this theme, the works by Shakhmalov should be separately identified (2005), which contain a deep and systematic theoretical substantiation of the problems of interaction between entrepreneurship and the state. In the works of Varnavsky (2002), the main emphasis is placed on the feasibility of applying different forms of public-private partnership to enterprises of the national infrastructure. As to the rationale for the prospect of such a partnership, attention is drawn to the research by Efimova (2003), Kondratiev (1989), Sosnowski (2011), Brussera (2007), Bukhareva (2009), Vdovenko (2004), Golovina (2010), Ostapyuk (2008), Pankratova (2009), Polyakova (2009) and many others. The study of the phenomenon of public-private partnership is undertaken by foreign scholars such as Grimsby and Lewis (2011), Delmon (2010). It should be noted the significant contribution of international organizations, such as the Asian Development Bank, the World Bank, the International Monetary Fund, the European Commission, the International Bank for Reconstruction and Development, the Public Private Partnerships in Infrastructure, the Organization for Economic Cooperation and Development and others. Attention of researchers is focused on disclosing the essence of the phenomenon of PPP, using partnerships in various fields of activity, identifying the advantages and disadvantages for each participant in cooperation,

as well as analysis of foreign experience in order to adapt to the realities of the Ukrainian economy.

At the same time, many issues need further development. First of all, it concerns the financing of the knowledge economy in terms of its constituent elements. Public-private partnerships can become one of the tools that can implement knowledge economy development programs. Famous economists and specialists in the field of public administration such as Amunz (2005), Bogomolov (2009) and others made a significant contribution to the study of the peculiarities of the formation of the institutional environment and the implementation of the institution of public-private partnership.

The world experience in financing infrastructure projects and trends in the development of PPP projects is researched by some domestic and foreign scholars, including Golian (2009), Klymenko (2003), Pavlyuk (2010), Fedulova (2009), Shilepnitsky (2010), etc. Concerning the issue of the financial provision of public-private partnership in the context of consideration of problems of the formation of financial resources, attention was paid to the works of such domestic and foreign scientists, in particular Piltya (2012), Ovsyannikova (2012), Mostepanyuk (2010), Yescomba (2007), etc.

However, despite a significant number of studies on the development and implementation of the concept of development of public-private partnership in Ukraine, little attention of the researchers is paid to the issue of preparedness and evaluation of financial opportunities for participation in public-private partnerships, in particular, the financial potential of public-private partnership and its use in the context of the financial policy of the state. Now, there were not developed generally accepted methodological approaches to assessing the financial potential of public-private partnership, and also determining its economic essence.

Table 1. Rating of availability of funding from different sources in some countries in 2014*

Country	Local banks	Foreign banks	PPP
Hungary	4 ¹⁾	4	3
Czech Republic	4	4	4
Poland	4	4	4
Russia	2	2	2
Ukraine	2	1	2

Notes: * compiled based on Zapatrina (2011), Ryzhkova (2012), Shchodo tendentsiy rozvytku ekonomiky Ukrainy (2014). ¹⁾4 – developed market, 1 – very limited opportunity to use the resource.

This aspect of the problem is of particular relevance to the domestic economy, because, based on data on financial potential, full information, both available and prospective, can be obtained on the totality of financial resources for PPPs.

Using data on available financial potential, it is possible to determine the optimal variant of the development of financial relations within the framework of the PPP and to realize certain tasks of the state's financial policy. Knowledge of the level, quality, dynamics of the financial potential of the PPP allows to identify internal reserves, wider use of financial incentives and ensuring a closer link between the planning indicators of the development of the territory and real possibilities for their implementation.

He creates important information for building new financial relations “the state – economic entities – financial organizations” and the solution of problematic issues related to the implementation of large socio-important tasks.

However, selective fragmentary approach to the outlined problem symbiosis is predominant, which makes their comprehensive solution impossible.

2. RESULTS

Formation of the PPPs' Institute in Ukraine can increase the efficiency of all factors of expanded reproduction in fundamentally different basis; provide the innovation dynamics for the economic development; form the conditions for the effective use of intellectual capacity and development of intellectual capital; increase the level of innovation activity and business attraction. The world practice has developed an array of tools to enable public-private partnership vehicles to engage vari-

ous financial and credit institutions in implementation of major investment programs via complex financing schemes (Bukhariev, 2009) (Table 1).

In this way, bank financing and application of PPP models are most common, with best results achieved when combining these sources of funding. PPP looks appealing to banks since they have the leverage to assess and monitor projects. Implementation of bank-financed PPP investment projects involves the following forms of financing (Ovsyannikova, 2012; Evropeyskaya ekonomicheskaya komissiya Organizatsii Ob'edinennykh Natsiy, 2008), (Figure 1).

It should be noted that in recent practice, financing of public-private partnership projects is most commonly based on the principles of project finance, which (unlike corporate financing) provides for creditors having absolutely no or limited right of recourse against the partnership member entities, should there arise any problems with repayment of funds with regard to the project (Ryzhkova, 2012). Public-private partnership financing depends on the type of capital, affecting proceeds, the level of risks, project structure, loan terms (maturity, interest rates/fees, the need in foreign currency), the financial attractiveness of the project, etc. The next stage in development of public-private partnership suggests the use of the project financing arrangement with more involvement of financial institutions (banks) in the implementation of PPP. Project financing is most commonly used in those economy sectors that require heavy capital expenditure for their development, have long-term capital-intensive assets, long amortization and payback periods. In our view, the concept of project financing as a funding mechanism perfectly suits the needs of PPP projects, however, the classical definition of project financing has to be adapted to Ukrainian

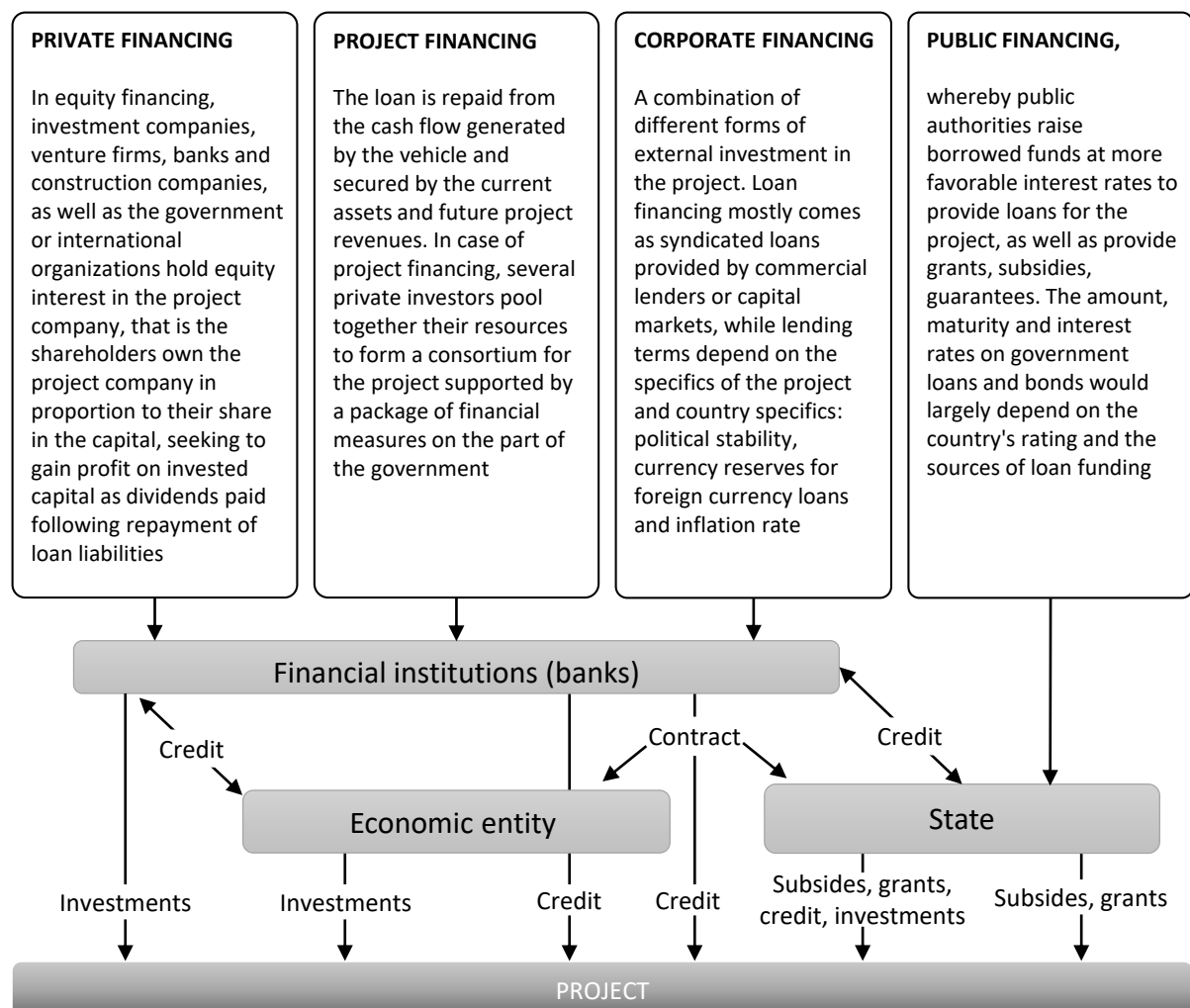


Figure 1. Forms of public-private partnership financing, compiled by authors

realities. The scheme is characterized by flexibility and effective management of external investments, equal sharing of risks and liabilities among the members. This will subsequently highlight the problem of effective use of funds in PPP financing, which calls for development of appropriate methodology of assessing the cost of state support and its feasibility analysis, as well as the use of financial instruments in certain PPP conditions. Based on the project financing structure, let us outline the sources of capital for the project vehicle, their features, upsides and downsides (Table 2).

The financial structure of public-private partnership projects allows leverage of modern financial instruments that are widely used around the

world; to implement investment projects to expand cooperation between public authorities and banks in the crisis management of the economy. The participation of banks and other financial institutions in PPP projects will:

- ensure the project company the necessary amount of capital;
- improve the quality of financial services institutions;
- develop new mechanisms and schemes to attract funds, including borrower support;
- formalize the rights of creditors with regard to timely debt repayment and service guarantees;

Table 2. An outline of PPP structure according to sources of project vehicle capital

Source	Upsides	Downsides
Public capital	No need of capital repayment and/or to incur the cost of capital lower project costs. Risks of misuse of funds.	Lengthy approval procedures. Many bids sent back to bidders for revision. Low activity in the regions suggesting lack of interest in the regions in receiving public funding.
Equity capital	Available throughout the whole project life cycle.	Limited resources. The need for distribution of rights and revenues (sale of shares).
Loan capital	Easily available. Wide range of options and terms. Risks shifted to creditors.	Participation of investors is limited only a part of project life cycle repayable.
Additional capital	Contributes to the vehicle's credit strength. May be poured at the very early stages of the project, when private business sees the benefits of increasing equity capital, but is unwilling to expose additional funds to high risks.	Is subject to repayment together with a share of profit.

- engage state-owned banks to lending and investment in national projects;
- stimulate attraction of credit resources by municipal enterprises, in particular under public-private partnership agreements;
- develop new mechanisms and schemes to attract funds include support for the borrower;
- decide the rights of creditors in terms of guarantees for timely repayment;
- involve state-owned banks to lend and invest in national projects;
- stimulate attraction of credit resources by utilities in particular by agreements of public-private partnership.

partners that is the key requirement and the main principle of PPP effectiveness (Figure 2).

One of the main directions of state financial support PPP may be to stimulate bank lending, in particular, on the basis of public-private partnership. Project financing accommodates different financial instruments, while certain government guarantees are meant to ensure a significant inflow of investments into the infrastructure sector. Project financing mechanism allows to combine different financial instruments and certain guarantees of the state should provide a significant influx of investment in infrastructure.

Obviously, one of the main methods to deal with the problems of public-private partnership financing should be the development of state programs for the Ukrainian banking sector. Among such measures of high priority one can include the following:

Financial institutions (banks) are most affected by financial risks. Financial risk is first of all about reliability of funding sources involved in implementation of the project, as well as restrictions emerging both at the time of the financial closing of the deal and throughout the project cycle. This risk may incur higher project costs and have a key impact on financial viability of the project.

PPP has a fundamental difference from the usual model of funding of development by pooling national or local governments resources and those of private businesses. Mutual risks management by the PPP parties is a key factor allowing them to capitalize on the financial leverage produced by this type of cooperation. It is a balanced distribution of risks between the private and public

- allocation of investment, financial and loan resources with priority on creation of jobs in information-intensive areas of the real sector (high-tech production, new energy industry, infrastructure projects);
- opening credit lines for financially sound financial institutions and companies;
- creation of the system of temporary insurance of all bank deposits;
- creation of conditions for "new blood infusion" into the banking system by enabling access to purchase of shares of commercial financial institutions;

Source: compiled by the authors.

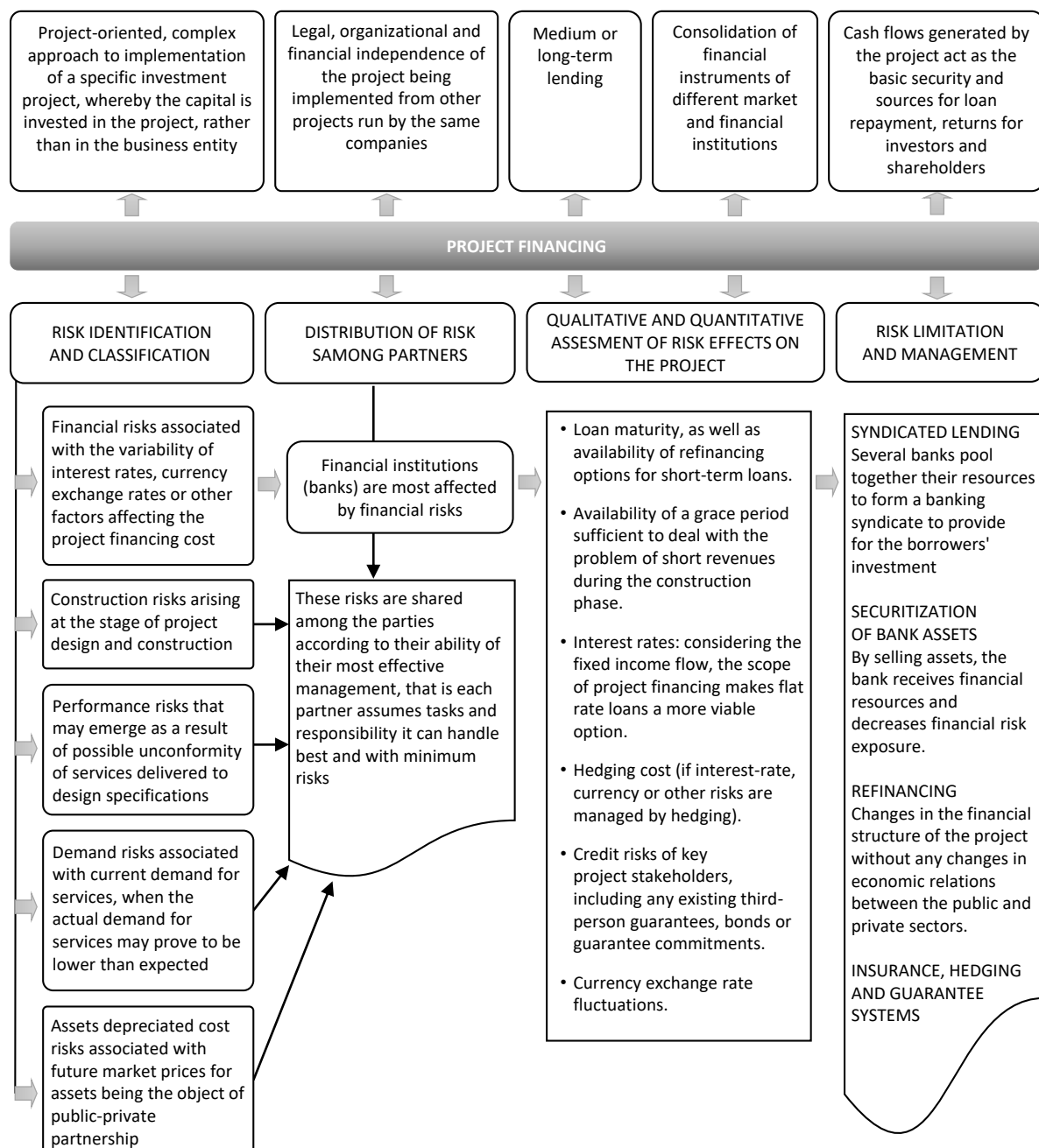


Figure 2. Project finance risk management for public-private partnership

- formation of a system crisis institutes for: consulting, marketing costs optimization, staff training for work in new economic conditions;
- partial nationalization of “problem” banks; stimulation of structural changes in business (Hubarieva, Chmutova, & Maksimova, 2016; Mushchynska, 2010);

In this way, bank financing and application of PPP models are most common, with best results achieved when combining these sources of funding. Today, Ukraine has a record of participation of lenders participation in implementation of national projects based on public-private partnership (see Sppendix, Table A), and the effectiveness and results of these projects have proven that investment projects need to be developed and implemented with participation of lending agencies, including banks.

CONCLUSION AND PROSPECTS FOR FUTURE RESEARCH

Considering the scarce availability of public funds, lack of own funds to finance capital-consuming PPP, the government should focus on incentives to stimulate bank lending as one of the primary measures of financial support of PPP on the part of the public sector, in particular, lending based on public-private partnership arrangements. The financial structure of public-private partnership projects allows leverage of modern financial instruments that are widely used around the world.

Participation of Ukrainian financial institutions in PPP projects will not only provide project vehicles with required amount of funding, but also help the institutions themselves to reach the next level in terms of quality and volume of their services. Project financing accommodates different financial instruments, while certain government guarantees are meant to ensure a significant inflow of investments into the infrastructure sector.

In this way, the need for mobilization of additional financial resources for implementation of investment projects calls for extended cooperation of state agencies and banks as a part of the effort of economic crisis management. In order to give banks better incentives for cooperation with local authorities to increase the scope of financing of public facilities it is necessary to develop new mechanisms and schemes to attract funds, including borrower support; formalize the rights of creditors with regard to timely debt repayment and service guarantees; engage state-owned banks in lending and investment in national projects; stimulate attraction of credit resources by municipal enterprises, in particular under public-private partnership agreements.

REFERENCES

1. Akitobi, B., Hemming, R., & Shvarts, G. (2007). Государственные инвестиции и государственно-частные партнерства [*Gosudarstvennye investitsii i gosudarstvenno-chastnye partnerstva*] (30 p.). Moscow: Mezhdunarodnyy Valyutnyy Fond.
2. Amunts, D. M. (2005). Государственно-частное партнёрство. Концессионная модель совместного участия государства и частного сектора в реализации финансовоёмких проектов [*Gosudarstvenno-chastnoe partnerstvo. Kontsessionnaya model sovmestnogo uchastiya gosudarstva i chastnogo sektora v realizatsii finansovoe mikh projektov*]. *Spravochnik rukovoditelya uchrezhdeniya kultury*, 12, 16-24.
3. Berduygina, Oksana N., Vlasov, Andrey I., & Kuzmin, Evgeny A. (2017). Investment capacity of the economy during the implementation of projects of public-private partnership. *Investment Man-*
4. Bogomolov, O. F. (2009). Государственно-частное партнерство: международный опыт и российская практика [*Gosudarstvenno-chastnoe partnerstvo: mezhdunarodnyy opyt i rossiyskaya praktika*]. *Problemy teorii i praktiki upravleniya*, 5, 22-25.
5. Brusser, P., Rozhkova, S. (2007). Государственно-частное партнерство – новый механизм привлечения инвестиций [*Gosudarstvenno-chastnoe partnerstvo – novyy mekhanizm privlecheniya investitsii*]. *Rynok tsennykh bumag*, 2, 29-33.
6. Bukharyev, V. M. (2009). За партнерські відносини бізнесу та влади [*Za partnerski vidnosyny biznesu ta vlady*]. *Visnyk podatkovoyi sluzhby Ukrainy*, 40, 6-7.
7. Delmon, D. (2010). Государственно-частное партнерство в инфраструктуре. Практическое руководство для органов государственной власти [*Gosudarstvenno-chastnoe partnerstvo v infrastrukture. Prakticheskoe rukovodstvo dlia organov gosudarstvennoy vlasti*] (153 p.). Mirovoy bank. PPIAF. Krasnoarmeysk: Izd-vo "ООО "GEO-TEK".
8. Efimova, L. I. (2003). Некоторые модели государственно-частных партнерств: тенденции и зарубежный опыт [*Nekotorye modeli gosudarstvenno-chastnykh partnerstv: tendentsii i zarubezhnyy opyt*]. *Vestnik Evroaziatskogo transportnogo soyuza*, 3, 15-22.
9. Fedulova, L. I., Yanenkova, I. H. (2009). Організаційний ресурс державно-приватного партнерства в умовах подолання наслідків кризи [*Orhanizatsiyni resurs derzhavno-privatnoho partnerstva v umovakh podolannya naslidkiv kryzy*]. *Naukovi pratsi*, 109(96), 57-60.

10. Heiets, V. (2004). Характер перехідних процесів до економіки знань [Kharakter perekhidnykh protsesiv do ekonomiky znan]. *Ekonomika Ukrainy*, 4, 4-14.
11. Holian, V. A. (2009). Інституційні передумови впровадження перспективних форм інвестиційного забезпечення реалізації підприємницьких проектів у сфері водокористування [Instytutsiini peredumovy vprovadzhennia perspektivnykh form investytsiinoho zabezpechennia realizatsii pidpriemnytskykh proektiv u sferi vodorokorystuvannia]. Retrieved from www.nbuv.gov.ua/portal/soc_gum/en_oif/2009_6_2/8.pdf
12. Holovinov, O. M. (2010). Державно-приватне партнерство в інноваційній сфері [Derzhavno-pryvatne partnerstvo v innovatsiini sferi]. *Visnyk ekonomichnoi nauky Ukrainy*, 1, 47-51.
13. Hubarieva, I., Chmutova, I., Maksimova, M. (2016). Ukrainian economy unshadowing as a factor of state economic security management. *Economic Annals–XXI*, 5-6, 25-28.
14. Klymenko, T. V. (2003). Підвищення ефективності фінансового потенціалу регіону [Pidvyshchennia efektyvnosti finansovoho potentsialu rehionu] (21 p.). Donetsk.
15. Kondratev, N. D. (1989). Проблемы экономической динамики [Problemy ekonomicheskoy dinamiki] (173 p.). Moscow: Ekonomika.
16. Kruhlov, V. V., Stadnyk, V. V. (2017). Державно-приватне партнерство як інструмент регіонального розвитку [Derzhavno-pryvatne partnerstvo yak instrument rehionalnoho rozvytku]. *Teoriia ta praktyka derzhavnoho upravlinnia*, 2(57), 11-17.
17. Mitskan, A. (2010). Фінансування енергоефективних проектів: Можливості Фінансування, Публічно-Приватне Партнерство, Альянс Глобального Розвитку [Finansuvannia energoefektyvnykh proektiv: Mozhlyvosti Finansuvannia, Publichno-Privatne Partnerstvo, Alians Hlobalnoho Rozvytku]. Retrieved from ecosys.com.ua/press/library/Kiev_Nov2010_08.pdf
18. Mostepaniuk, A. V. (2010). Еволюція наукових поглядів на співпрацю держави та бізнесу в ринковій економіці [Evolutsiia naukovykh pohliadiv na spivpratsiu derzhavy ta biznesu v rynkovii ekonomitsii]. *Universytetski naukovyi zapysky*, 2(34), 291-299.
19. Mushchynska, N. Yu. (2010). Публічно-приватне партнерство як інструмент сталого регіонального розвитку [Publichno-pryvatne partnerstvo yak instrument staloho rehionalnoho rozvytku]. *Nauchno-tekhnycheskyi sbornik "Kommunalnoe khoziaystvo gorodov"*, 94, 162-167.
20. Ostapuk, S. F. (2008). Государственно-частное партнерство в реализации бюджетных целевых программ [Gosudarstvenno-chastnoe partnerstvo v realizatsii byudzhetykh tselevykh programm]. *Problemy sovremennoy ekonomii*, 30(27), 32-34.
21. Ovsianynkova, Ya. O. (2012). Джерела фінансування проектів публічно-приватного партнерства [Dzherela finansuvannia proektiv publichno-pryvatnoho partnerstva]. *Naukovyi visnyk: Finansy, banky, investytsii*, 1, 36-40.
22. Pankratov, A. A. (2009). Государственно-частное партнёрство и преодоление инфраструктурного дефицита [Gosudarstvenno-chastnoe partnerstvo i preodolenie infrastruktturnogo defitsita]. *Strakhovoe delo*, 7, 58-64.
23. Pavliuk, K. V., Pavliuk, S. M. (2010). Сутність і роль державно-приватного партнерства в соціально-економічному розвитку держави [Sutnist i rol derzhavno-pryvatnoho partnerstva v sotsialno-ekonomichnomu rozvytku derzhavy]. *Naukovi pratsi Kirovohrads'koho natsionalnoho tekhnichnoho universytetu. Ekonomichni nauky*, 17, 10-19.
24. Poliakova, O. M. (2009). Державно-приватне партнерство в Україні: проблеми становлення [Derzhavno-pryvatne partnerstvo v Ukraini: problemy stanovlennia]. *Nauchno-tekhnycheskyi sbornik*, 87, 317-322.
25. Pyltiai, O. (2012). Фінансові механізми публічно-приватного партнерства [Finansovi mekhanizmy publichno-pryvatnoho partnerstva]. *Visnyk Kyivskoho natsionalnoho torhovelno-ekonomichnoho universytetu*, 3, 63-74.
26. Ryzhkova, H. V. (2012). Банківське кредитування як джерело фінансування проектів підвищення енергоефективності підприємств [Bankivske kredytuvannia yak dzherelo finansuvannia proektiv pidvyshchennia energoefektyvnosti pidpriemstv]. *Visnyk Zaporizkoho natsionalnoho universytetu*, 1(13), 214-222.
27. Shamkhalov, F. I. (2005). Государство и экономика. Власть и бизнес [Gosudarstvo i ekonomika. Vlast i biznes] (714 p.). Moscow: Ekonomika.
28. Shylepnyskyi, P. I. (2010). Особливості впровадження проектів державно-приватного партнерства. Уроки для України [Osoblyvosti vprovadzhennia proektiv derzhavno-pryvatnoho partnerstva. Uroky dlia Ukrainy]. In Проблемы развития внешнеэкономических связей и привлечения иностранных инвестиций: региональный аспект [Problemy razvitiia vneshneekonomicheskikh svyazey i privlecheniya inostrannykh investytsiy: regionalnyi aspekt] (pp. 1014-1017). Donetsk: DonNU.
29. Sosnovskyi, A. (2011). Партнерство державного та приватного секторів як ефективний метод реалізації проектів з розвитку інфраструктури [Partnerstvo derzhavnoho ta pryvatnoho sektoriv yak efektyvnyi metod realizatsii proektiv z rozvytku infrastruktury]. *Visnyk MNTU: Seriya ekonomika*, 1, 38-45.
30. Statiukha, H. O., Skladanyni, D. M., & Bondarenko, O. S. (2011). Вступ до планування оптимального експерименту [Vstup do planuvannia optymalnoho eksperymentu] (124 p.). Kyiv: NTUU "KPI".

31. Tsurkan, M., Andreeva, S., Lyubarskaya, M., Chekalin, V., & Lapushinskaya, G. (2017). Organizational and financial mechanisms for implementation of the projects in the field of increasing the energy efficiency of the regional economy. *Problems and Perspectives in Management*, 15(3), 453-466. doi:10.21511/ppm.15(3-2).2017.13
32. Varnavskiy, V. G. (2002). Концессии в транспортной инфраструктуре: теория, практика, перспективы [*Kontses-sii v transportnoy infrastrukture: teoriya, praktika, perspektivy*] (189 p.). Moscow: IMEMO RAN.
33. Vdovenko, Yu. S. (2004). Економіко-правова сутність концесії: методологічний аспект [Eko-nomiko-pravova sutnist kontsesii: metodologichnyi aspekt]. *Zbirnyk naukovykh prats Kyivskoho uni-versytetu ekonomiky i tekhnolohii transportu: Seriya "Ekonomika i upravlinnia"*, 6, 62-69.
34. Yescombe, E. R. (2007). *Public-private partnerships: principles of policy and finance* (350 p.). Great Britain: Elsevier Ltd.
35. Zapatrina, I. V. (2011). Потенциал публично-частного партнерства для развивающихся экономик [*Potentsial publichno-chastnogo partnerstva dlya razvivayuschikh-sya ekonomik*] (152 p.). Kiev: Izdatelskiy tsentr Soyuzu sobstvennikov zhilya Ukrainy.
36. Методика виявлення ризиків, пов'язаних з державно-приватним партнерством, їх оцінки та визначення форми управління ними: Постанова Кабінету Міністрів України від 16.02.2011 № 232 [Metodyka vyavlennia ryzykiv, poviazanykh z derzhavno-pryvatnym partnerstvom, yikh otsinky ta vyznachen-nia formy upravlinnia nymy: Postanova Kabinetu Ministriv Ukrainy vid 16.02.2011 No 232]. Retrieved from zakon4.rada.gov.ua/laws/show/232-2011-%D0%BF
37. Практическое руководство по вопросам эффективного управления в сфере государственно-частного партнерства [Prakticheskoe rukovodstvo po voprosam jeffektivnogo upravleniya v sfere gosudarstvenno-chastnogo partnerstva] (2008). Zheneva: Evropeyskaya ekonomicheskaya komissiya Organizatsii Obiedinen-nykh Natsiy, 114 p.
38. Регіональний розвиток та державна регіональна політика в Україні: стан і перспективи змін у контексті глобальних викликів та європейських стандартів політики: Аналітичний звіт [Rehionalnyi rozvytok ta derzhavna rehiona na polityka v Ukraini: stan i perspektivy zmin u konteksti hlobalnykh vyklykiv ta yevropeyskykh standartiv polityky: Analitychnyi zvit]. Retrieved from <http://surdp.eu/Analytical-Report>
39. Щодо тенденцій розвитку економіки України у 2013–2014 рр. [Shchodo tendentsii rozvytku ekonomiky Ukrainy u 2013–2014 rr.]. Retrieved from <http://www.niss.gov.ua/content/articles/files/Prognoz2014-70261.pdf>

APPENDIX

Table A. Case study of participation of credit institutions in public-private partnership projects*

Source: * compiled by the authors Kruglov (2017), Mitskan (2010), Rehionalnyy rozvytok ta derzhavna rehional'na polityka v Ukraini: Analitychnyy zvit (2016).

Project (Company)	Ukrainian banks loans			World Bank loans		EBRD loans	
–	ME Teplopostachannia Mista Odesy (ME Odessa Heat Supply Systems)	ME Teplopostachannia Mista Odesy (ME Odessa Heat Supply Systems)	ME Illichivsk-teploenergo (ME Illichivsk Heat and Power Company)	Kyiv Heat Supply project (1999–2004)	Energy Saving Investments project (2009–2012) Members of the project – Odessa, Chernihiv, Kalush, Kolomyia, Cherkasy, Drohobych, Kharkiv, Slaviansk, Balty	Three heat supply projects: Odessa, Cherkasy, Ivano-Frankivsk (2008–2009)	Eight heat supply project in the preparation stage (2009–2010)
Creditor bank	OJSC CB Nadra	OJSC CB Nadra	The State Export-Import Bank of Ukraine	–	–	Beneficiaries - the city heat supply companies	
Amount and terms	Amount – UAH 37.5 mln Due date February 11, 2009 17% per annum	Amount – UAH 18.976 mln Due date September 30, 2009 18% per annum	Amount – UAH 5 mln 20% per annum plus annual commission for credit line management at the rate of 0.015% of the debt limit	USD 200 mln LIBOR base rate plus LIBOR gross margin One-time commission fee of 0.75%. Interest is payable twice a year Repayment by 2018	USD 78.12 mln in loan currency plus floating average LIBOR base rate One-time commission fee of 0.25%. Interest is payable twice a year Repayment by 2027	EUR 44.8 mln	EUR 285 mln
Loan purpose	Payment for gas, electric and heat energy, repayment of earlier loans	Financing of costs of reconstruction of the heat supply system in Shkilny district of Odessa.	Timely payments for natural gas during the heating season 2009–2010	Improvement of operating capacities of the centralized heating system in Kyiv, support of measures of commercialization of Kyivenergo and Kyivzhytlokomunenergo, promotion of privatization of centralized heating services in Kyiv	Facilitating utility companies in improving quality and reliability of service provision and reduction of maintenance costs	Loan financing of priority programs of capital investments aimed at renovation and modernization of existing boiler facilities, replacement of heat supply networks, introduction of new heat supply stations at apartment buildings equipped with heat meters	
Short description	Security: Real estate mortgage to secure loan repayment and payment of loan interests Subject to approval by city authorities		Security: Non-residential real estate – the Raduaga public amenities center, municipal property of Illichivsk City Council	Grounds – Bilateral Loan Agreement between Ukraine and the International Bank for Reconstruction and Development as of October 14, 1998 (ratified on March 23, 1999)		Implementation arrangement: About EUR 1.5 mln for technical assistance. Pre-project analysis (EUR 200-300 ths) Project implementation support (EUR 500 ths), corporate development program (EUR 350 ths), projects aimed at improvement of the borrower's repayment ability (EUR 350 ths)	