

CHAPTER 11
THE INSTITUTIONAL ROLE
OF PUBLIC-PRIVATE PARTNERSHIPS
IN SHAPING THE COST OF CAPITAL IN INFRASTRUCTURE
PROJECTS FOR UKRAINE’S GREEN RECONSTRUCTION

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INTRODUCTION

The current stage of Ukraine’s economic development is shaped by an unprecedented combination of structural transformations, wartime challenges, and the urgent need for large-scale infrastructure reconstruction. According to estimates by the World Bank ^{1, 2} the European Commission (EC), and the European Investment Bank (EIB) ³, the total financing required for recovery exceeds \$500 billion, substantially surpassing the capacity of public budgets and necessitating the search for an institutional mechanism capable of mobilizing private capital.

Under these conditions, public-private partnerships (PPPs) assume a fundamentally new functional role – not merely as an instrument for delivering individual infrastructure projects but as a systemic mechanism for transforming the investment model of development. PPPs enable the long-term integration of public resources, private capital, and international financing. The effectiveness of PPPs is determined by both the volume of resources mobilised and, more fundamentally, by the quality of their institutional architecture, which determines risk allocation, the cost of capital, and the overall financial viability of infrastructure projects.

¹ Government of European Union; Nations, United. Ukraine: Rapid Damage and Needs Assessment (RDNA4) (2025). February 2022 – December 2024. (Ukrainian). Washington, D.C.: *World Bank Group*. <http://documents.worldbank.org/curated/en/099052925103531065>

² UNDP. (2025). Ukraine - Fourth Rapid Damage and Needs Assessment (RDNA4) : February 2022 – December 2024. <https://www.undp.org/ukraine/press-releases/updated-damage-assessment-finds-524-billion-needed-recovery-ukraine-over-next-decade>

³ EIB Investment report 2025/2026. Capitalising on Europe’s strengths (2026). *European Investment Bank Group*. <https://www.eib.org/files/publications/20250379-030326-investment-report-2025-en.pdf>

Conventional approaches to the analysis of PPPs, as reflected in the works of E.R. Yescombe ⁴, the World Bank ⁵, and the International Monetary Fund (IMF) ⁶, primarily focus on risk allocation, financing structures, and contractual arrangements. In contrast, recent research has increasingly shifted toward examining the relationship between the institutional environment and the cost of capital, particularly through the channels of reduced regulatory uncertainty, lower transaction costs, and diminished risk premium. Within this context, the concept of an institutional-investment multiplier is emerging, according to which the quality of the regulatory environment determines the scale and efficiency of private capital mobilization.

Particular relevance is attributed to analysis of the financial parameters of PPP projects in the context of macro-financial constraints. According to estimates by the IMF, in countries with weak institutional settings, contingent liabilities associated with PPPs may reach 3–6% of GDP, necessitating the integration of PPP mechanisms into medium-term fiscal planning arrangements. By contrast, the experience of EU countries, along with the recommendations of the EIB, demonstrates that, under a robust institutional design, PPPs can generate a substantial investment multiplier effect, with leverage ratios typically ranging from 3 to 5.

A new wave of institutional reforms in the field of PPPs in Ukraine, particularly the adaptation of the Law of Ukraine “On Public-Private Partnership” № 4510-IX (2025) ⁷, establishes fundamentally new conditions for the functioning of this mechanism. The introduction of blended finance instruments, direct agreements with lenders, step-in rights, and the expansion of PPP application areas significantly reshapes the financial architecture of infrastructure projects, affecting both risk allocation and the cost of capital. However, a systematic assessment of these institutional changes through the lens of financial indicators such as WACC and NPV, as well as their macroeconomic implications, remains insufficiently developed in the existing literature. Against this background, the research problem lies in the absence of

⁴ Yescombe, E.R. (2007). *Public-private partnerships: principles of policy & finance*: monograph. Butterworth-Heinemann. ISBN: 978-0750680547. <https://doi.org/10.1016/B978-0-7506-8054-7.X5022-9>

⁵ Public-private partnerships Reference guide. (2017). *The World Bank*. <https://ppp.worldbank.org/sites/default/files/2024-08/PPP%20Reference%20Guide%20Version%203.pdf>

⁶ Pillar III: Fiscal risk analysis and management (2018). *IMF. Fiscal affairs dept.* <https://www.elibrary.imf.org/display/book/9781484331859/ch04.xml>

⁷ Law of Ukraine “On Public-Private Partnership” № 4510-IX (2025, June 19). <https://zakon.rada.gov.ua/laws/show/4510-20#Text>

a comprehensive theoretical and methodological approach to evaluating the impact of PPP institutional transformation on the cost of capital, project bankability, and macro-financial sustainability in the context of post-war reconstruction.

The aim of this section is to provide a theoretical justification and develop a methodological approach for assessing the effects of institutional changes in PPPs on the financial parameters of infrastructure projects, particularly WACC and NPV, as well as on the formation of an investment multiplier in the Ukrainian economy. The practical relevance of the results lies in their potential application to the design and development of a pipeline of financially viable infrastructure projects capable of attracting private and international capital.

11.1. Institutional Transformation of PPPs as a Mechanism for Mobilizing Investment in Green Infrastructure 11.1.1. The Economic Nature of PPPs in the Contemporary Model of Infrastructure Development

In the modern economic system, PPPs are acquiring a qualitatively new meaning, extending beyond their traditional interpretation as instruments for attracting private capital to finance individual infrastructure assets. Their functional role is increasingly transforming into that of an institutional mechanism for coordinating long-term investment decisions between the state and the private sector under conditions of resource constraints and the growing complexity of infrastructure systems. From the perspective of economic theory, PPPs can be conceptualized as a specific organizational form of the investment process, within which the state delegates certain functions related to the strategic control over development parameters ^{8, 9}. PPPs perform investment, distributive, and coordination functions.

The investment function of PPPs lies in mobilizing of additional financial resources that cannot be secured solely through public budgetary sources,

⁸ Yescombe, E.R. (2007). *Public-private partnerships: principles of policy & finance*: monograph. Butterworth-Heinemann. ISBN: 978-0750680547. <https://doi.org/10.1016/B978-0-7506-8054-7.X5022-9>

⁹ Public-private partnerships Reference guide. (2017). *The World Bank*. <https://ppp.worldbank.org/sites/default/files/2024-08/PPP%20Reference%20Guide%20Version%203.pdf>

which is particularly critical in the context of large-scale reconstruction^{10, 11}. The distributive function is realized through the efficient allocation of risks, revenues, and responsibilities among project participants, while the coordination function ensures the alignment of interests among economic agents over the long-term horizon^{12, 13}. A defining characteristic of modern infrastructure systems is their high capital intensity and extended reproduction cycle, which constrains the capacity of traditional budgetary financing without generating excessive fiscal pressure. In this context, PPPs should be understood not as a substitute for public financing, but as its institutional complement, enabling optimisation of the intertemporal allocation of investment expenditures and associated risks¹⁴.

The economic efficiency of PPPs is determined by the institutional conditions governing private sector participation rather than by the mere involvement of private capital. In the presence of regulatory uncertainty, elevated transaction costs, and weak investor protection, the private sector incorporates these risks into the cost of financing, offsetting the potential advantages of partnership arrangements. Consequently, institutional quality emerges as a key determinant of the cost of capital¹⁵.

Previous experience of PPP implementation in Ukraine reveals the presence for systematic institutional constraints that have hindered the formation of this mechanism as a fully-fledged instrument of infrastructure investment. At the core of these constraints lies the absence of a coherent economic model governing PPPs, which is manifested in fragmented regulatory structure and procedural uncertainty. The duality of the regulatory environment, particularly the parallel application of public procurement legislation and PPP-specific

¹⁰ UNDP. (2025). Ukraine - Fourth Rapid Damage and Needs Assessment (RDNA4) : February 2022 – December 2024. <https://www.undp.org/ukraine/press-releases/updated-damage-assessment-finds-524-billion-needed-recovery-ukraine-over-next-decade>

¹¹ Government of European Union; Nations, United. Ukraine: Rapid Damage and Needs Assessment (RDNA4) (2025). February 2022 – December 2024. (Ukrainian). Washington, D.C.: *World Bank Group*. <http://documents.worldbank.org/curated/en/099052925103531065>

¹² OECD Principles for private sector participation in infrastructure (2007). *OECD*. https://www.oecd.org/content/dam/oecd/en/publications/reports/2007/07/oecd-principles-for-private-sector-participation-in-infrastructure_g1gh801a/9789264034105-en.pdf

¹³ Public-Private Partnerships and Investment in Infrastructure (2010). *OECD*. https://www.oecd.org/content/dam/oecd/en/publications/reports/2010/09/public-private-partnerships-and-investment-in-infrastructure_g17a1ecd/5km7jf6q8f0t-en.pdf

¹⁴ Kim, Jay-Hyung, Fallov, Jonas Arp, & Groom, Simon. (2020). Public Investment Management Reference Guide. *World Bank Group*. <https://documents1.worldbank.org/curated/en/548751582775237521/pdf/Public-Investment-Management-Reference-Guide.pdf>

¹⁵ Steffen, B. (2020). Estimating the cost of capital for renewable energy projects. *Energy Economics*, 88, 104783. <https://doi.org/10.1016/j.eneco.2020.104783>

regulations, generates additional transaction costs and reduced the predictability of the investment process. Lengthy approval procedures and the lack of standardized approaches to project preparation have diverged from international best practices, according to which the effectiveness of PPPs depends on procedural transparency, standardization, and clearly defined risk allocation mechanisms¹⁶. International guidelines emphasize that institutional coherence and regulatory predictability are key determinants of project bankability and the ability to attract long-term private capital¹⁷.

A further constraint has been the inefficient allocation of risks. In practice, a significant share of risks – including demand risk, exchange rate volatility, and regulatory risk – has been transferred to the private partner without adequate compensatory mechanisms. This has resulted in an elevated risk premium and, consequently, a higher cost of capital¹⁸. In addition, PPPs have often been used as an off-budget financing instrument without proper integration into the public financial management system. The lack of accounting for long-term and contingent liabilities has created risks of hidden debt accumulation, undermined fiscal sustainability and reduced confidence among investors and international financial institutions¹⁹. Taken together, these factors have shaped an institutional environment in which PPPs have been unable to function as an effective mechanism for mobilizing investment, while the formal existence of legal instruments has failed to compensate for the absence of a coherent economic logic in their application.

11.1.2. The Impact of Institutional Changes on the Cost of Capital and Investment Attractiveness of Infrastructure Projects

The institutional transformation of the PPP model has a direct economic dimension, manifested primarily through changes in the cost of capital for infrastructure projects. In this context, institutional parameters determine the general conditions of investment as well as the quantitative characteristics of

¹⁶ Public-private partnerships Reference guide. (2017). *The World Bank*. <https://ppp.worldbank.org/sites/default/files/2024-08/PPP%20Reference%20Guide%20Version%203.pdf>

¹⁷ Public-Private Partnerships and Investment in Infrastructure (2010). *OECD*. https://www.oecd.org/content/dam/oecd/en/publications/reports/2010/09/public-private-partnerships-and-investment-in-infrastructure_g17a1ecd/5km7jf6q8f0t-en.pdf

¹⁸ Yescombe, E.R. (2007). *Public-private partnerships: principles of policy & finance: monograph*. Butterworth-Heinemann. ISBN: 978-0750680547. <https://doi.org/10.1016/B978-0-7506-8054-7.X5022-9>

¹⁹ Pillar III: Fiscal risk analysis and management (2018). *IMF. Fiscal affairs dept.* <https://www.elibrary.imf.org/display/book/9781484331859/ch04.xml>

project financial viability. For capital-intensive infrastructure initiatives with long implementation horizons, the cost of capital constitutes a key determinant of investment decision-making. Through discounted cash flow analysis, changes in financing costs directly affect core financial indicators such as NPV and IRR²⁰.

In classical financial theory, the cost of capital is defined as the weighted average cost of capital (WACC), encompassing the risk-free rate, risk premium, and the cost of debt financing. In economies undergoing structural transformation, the institutional component of risk constitutes a decisive element in the formation of WACC. This is substantiated by contemporary central bank approaches, which incorporate climate-related risks into financial systems through their transmission into the cost of capital and associated risk premium^{21,22}. Risk allocation in PPP arrangements – shaped by institutional arrangements – constitutes a critical determinant of financing costs. As established in the literature, an efficient allocation of risks between the public and private partners reduces the overall cost of financing and enhances project investment attractiveness²³.

In the previous PPP model in Ukraine, the combination of regulatory uncertainty, fragmented legal configuration, and limited procedural transparency generated an elevated institutional risk premium. This premium was directly transmitted into higher financing costs, thereby constraining the implementation of economically viable infrastructure projects. Under such conditions, even potentially efficient investment initiatives lost financial viability due to the mismatch between expected returns and the actual cost of capital²⁴.

Institutional reforms introduced by the new legislative approach establish a fundamentally different logic of PPP functioning, oriented towards the systemic

²⁰ Steffen, B. (2020). Estimating the cost of capital for renewable energy projects. *Energy Economics*, 88, 104783. <https://doi.org/10.1016/j.eneco.2020.104783>

²¹ Greening monetary policy operations: exploring additional options (2026). *Network for greening the financial system*. <https://www.ngfs.net/en/publications-and-statistics/publications/greening-monetary-policy-operations-exploring-additional-options>

²² Guide to climate scenario analysis for central bank and supervisors – update (2025). *Network for greening the financial system*. <https://www.ngfs.net/en/publications-and-statistics/publications/2025-guide-climate-scenario-analysis-central-banks-and-supervisors>

²³ Yescombe, E.R. (2007). *Public-private partnerships: principles of policy & finance*: monograph. Butterworth-Heinemann. ISBN: 978-0750680547. <https://doi.org/10.1016/B978-0-7506-8054-7.X5022-9>

²⁴ Public-private partnerships Reference guide. (2017). *The World Bank*. <https://ppp.worldbank.org/sites/default/files/2024-08/PPP%20Reference%20Guide%20Version%203.pdf>

reduction of institutional risk²⁵. The unification of procedures and the recognition of PPPs as a distinct legal regime reduce regulatory uncertainty; the formalisation of risk allocation principles enhances the predictability of future cash flows; and the integration of PPP mechanisms into fiscal planning frameworks ensures the stability and credibility of public commitments. Taken together, these changes improve the bankability of infrastructure projects and reduce risk premium within the capital structure^{26, 27}.

The effects of such institutional changes are not only qualitative but also quantitatively measurable. Evidence from international practice suggests that improvements in the institutional environment for infrastructure investment can reduce risk premium by 100–300 basis points, which corresponds to a decline in the weighted average cost of capital (WACC) of approximately 1–1.5 percentage points^{28, 29}. The economic implications of such a reduction are substantial. For a typical infrastructure project valued at \$1 billion with an implementation horizon of 20–30 years, even a one-percentage-point decrease in WACC leads to a reduction in discounted costs by approximately 10–15% of the initial investment. This implies that a significant share of projects previously situated at the threshold of financial viability shifts into the range of positive net present value.

This effect is particularly pronounced in transport decarbonization projects, which are characterized by high capital intensity, long payback periods, and elevated sensitivity to financing costs. Under such conditions, institutionally driven reductions in the cost of capital may become a decisive factor enabling project implementation, even in the absence of substantial direct fiscal support³⁰. Institutional transformation affects the level and the structure of project financing. Lower risk exposure and greater predictability of cash flows

²⁵ Law of Ukraine “On Public-Private Partnership” № 4510-IX (2025, June 19). <https://zakon.rada.gov.ua/laws/show/4510-20#Text>

²⁶ Public-Private Partnerships and Investment in Infrastructure (2010). *OECD*. https://www.oecd.org/content/dam/oecd/en/publications/reports/2010/09/public-private-partnerships-and-investment-in-infrastructure_g17a1ecd/5km7jff6q8f0t-en.pdf

²⁷ Pillar III: Fiscal risk analysis and management (2018). *IMF. Fiscal affairs dept.* <https://www.elibrary.imf.org/display/book/9781484331859/ch04.xml>

²⁸ EIB Investment report 2025/2026. Capitalising on Europe’s strengths (2026). *European Investment Bank Group*. <https://www.eib.org/files/publications/20250379-030326-investment-report-2025-en.pdf>

²⁹ Steffen, B. (2020). Estimating the cost of capital for renewable energy projects. *Energy Economics*, 88, 104783. <https://doi.org/10.1016/j.eneco.2020.104783>

³⁰ Edenhofer, O., Lessmann, K. & Tahri, I. (2024). Asset pricing and the carbon beta of externalities. *Journal of environmental economics and management*. <https://doi.org/10.1016/j.jeeem.2024.102969>

create conditions for a broader use of debt financing, including funding from international financial institutions, thereby further optimizing the capital structure and reducing WACC.

In this configuration, institutional reforms act as a multiplier of financial resources. A reduction in the cost of capital enhances the efficiency of individual projects while simultaneously expanding the overall investment capacity of the economy under fiscal constraints, thereby generating an investment scaling effect. In this sense, the regulatory transformation of PPPs produces a dual economic outcome: it lowers the cost of financing infrastructure projects while simultaneously enabling an expansion of total investment volumes. Through this mechanism, institutional change translates from the domain of regulatory design into that of tangible economic impact. From a broader macroeconomic perspective, this implies that the quality of the institutional environment becomes a decisive factor in determining the pace of infrastructure development and the ecological transformation of the economy. Financing costs serve as the key transmission channel through which regulatory policy is converted into concrete investment decisions.

To illustrate the financial implications of institutional change, consider a stylized infrastructure project with a value of \$1 billion and a 25-year implementation horizon. At a baseline WACC of 12%, a one-percentage-point reduction of discounted costs of approximately \$120–150 million. Even such a marginal improvement in institutional conditions can fundamentally alter the financial configuration of a project, shifting it from the borderline zone of investment feasibility into the range of positive net present value. Accordingly, institutional parameters function not merely as enabling conditions, but as direct determinants of the economic performance of infrastructure projects.

11.2. Fiscal Constraints and Investment Leverage of PPP

11.2.1. Fiscal Constraints of the Infrastructure Reconstruction in Ukraine

Post-war infrastructure reconstruction in Ukraine is taking place under conditions of severe fiscal constraints, which objectively define the limits of public investment policy. The scale of reconstruction needs, according to international estimates, substantially exceeds the capacity of both budgetary and donor financing, generating a structural gap between required and available

resources^{31,32}. Similar imbalances are observed in EU economies, where the shortage of infrastructure investment is regarded as a key constraint on economic recovery and the green transition^{33,34}. From a macroeconomic perspective, this reflects the operation of the intertemporal budget constraint, according to which the long-term trajectory of public expenditure must remain consistent with the economy's capacity to generate revenues without undermining fiscal sustainability. Under wartime conditions, this constraint becomes significantly more binding due to the combined effect of several factors: rising defence expenditure, a narrowing tax base, limited access to market financing, and elevated risk premium.

A critical issue in this context is the relationship between economic growth rates and the cost of sovereign borrowing. When the cost of debt financing exceeds the rate of economic growth, the expansion of public debt generates risks of macro-financial instability, thereby constraining the scope for direct budgetary financing of infrastructure³⁵. Under such conditions, the traditional model of infrastructure financing, based on public expenditure or sovereign borrowing, proves insufficient to meet the required scale of reconstruction. This necessitates the development of mechanisms capable of mobilizing additional investment without a proportional increase in the fiscal burden.

In contemporary economic policy, PPPs function as a channel for transforming constrained public resources into an expanded investment flow through the mobilisation of private capital. Their economic role lies not in substituting public financing, but in complementing and scaling it. Unlike the traditional model, where the state acts as the sole investor, PPPs distribute financial commitments, risks, and responsibilities between the public and private sectors. This creates the conditions for implementing projects that

³¹ UNDP. (2025). Ukraine – Fourth Rapid Damage and Needs Assessment (RDNA4) : February 2022 – December 2024. <https://www.undp.org/ukraine/press-releases/updated-damage-assessment-finds-524-billion-needed-recovery-ukraine-over-next-decade>

³² Government of European Union; Nations, United. Ukraine: Rapid Damage and Needs Assessment (RDNA4) (2025). February 2022 – December 2024. (Ukrainian). Washington, D.C.: *World Bank Group*. <http://documents.worldbank.org/curated/en/099052925103531065>

³³ EIB investment survey 2023. European Union Overview (2023). *European Investment Bank*. https://www.eib.org/attachments/lucalli/20230285_econ_eibis_2023_eu_en.pdf

³⁴ EIB Investment report 2025/2026. Capitalising on Europe's strengths (2026). *European Investment Bank Group*. <https://www.eib.org/files/publications/20250379-030326-investment-report-2025-en.pdf>

³⁵ Pillar III: Fiscal risk analysis and management (2018). *IMF. Fiscal affairs dept.* <https://www.elibrary.imf.org/display/book/9781484331859/ch04.xml>

would otherwise be postponed or remain unrealized under binding fiscal constraints³⁶.

The economic rationale of PPPs manifests across three interrelated dimensions. First, the mobilization of private capital reduces the need for upfront public expenditure. Second, private sector participation enhances project efficiency through stricter financial discipline and time constraints. Third, the allocation of risks mitigates the fiscal burden on the state under adverse scenarios^{37,38}. The effectiveness of PPPs, however, is fundamentally contingent upon the quality of the institutional environment. Regulatory predictability, procedural transparency, and clearly defined risk allocation arrangements determine project bankability and the capacity to attract long-term private capital³⁹. Nevertheless, PPPs cannot be considered fiscally neutral instruments. The creation of long-term and contingent government obligations necessitates their integration into formal fiscal planning settings. In the absence of such institutional arrangements, PPPs may evolve into a source of hidden fiscal risks⁴⁰.

11.2.2. Investment leverage as an economic effect of public-private partnerships

The central economic outcome of PPP implementation is the formation of investment leverage, reflecting the ability of public resources to generate additional private investment. In formal terms, this relationship can be expressed as:

$$I_{tot} = B \cdot L$$

where I_{tot} – denotes the total volume of investment, B represents public (budgetary) commitments, and L is the investment leverage coefficient.

³⁶ Public-private partnerships Reference guide. (2017). *The World Bank*. <https://ppp.worldbank.org/sites/default/files/2024-08/PPP%20Reference%20Guide%20Version%203.pdf>

³⁷ Yescombe, E.R. (2007). *Public-private partnerships: principles of policy & finance: monograph*. Butterworth-Heinemann. ISBN: 978-0750680547. <https://doi.org/10.1016/B978-0-7506-8054-7.X5022-9>

³⁸ Public-Private Partnerships and Investment in Infrastructure (2010). *OECD*. https://www.oecd.org/content/dam/oecd/en/publications/reports/2010/09/public-private-partnerships-and-investment-in-infrastructure_g17a1ecd/5km7jf6q8f0t-en.pdf

³⁹ Public-private partnerships Reference guide. (2017). *The World Bank*. <https://ppp.worldbank.org/sites/default/files/2024-08/PPP%20Reference%20Guide%20Version%203.pdf>

⁴⁰ Pillar III: Fiscal risk analysis and management (2018). *IMF. Fiscal affairs dept*. <https://www.elibrary.imf.org/display/book/9781484331859/ch04.xml>

Table 1

Fiscal parameters and the investment effect of PPPs

Indicator	Value	Economic interpretation
GDP of Ukraine (indicative)	\$160 billion	Baseline for calculations
Fiscally sustainable PPP level	1-1.5% of GDP	\$1.6-2.4 billion in commitments
Leverage coefficient (L)	3-5	International benchmark
Potential investment volume	\$5-12 billion annually	Through PPP mechanisms
Share of reconstruction needs covered (RDNA)	10-20%	Via PPPs

Source: compiled by the author based on ⁴¹, ⁴², ⁴³

In international practice, the leverage coefficient for infrastructure projects typically ranges from 3 to 5, implying the mobilization of three to five units of total investment per unit of public resources. According to OECD estimates ⁴⁴, the share of private capital in infrastructure financing may reach 70-85%, confirming the presence of a substantial investment multiplier effect ^{45, 46}. Such leverage is achieved under conditions of a well-developed institutional environment, effective risk allocation, and access to long-term financing. For Ukraine, this implies the possibility of significant investment scaling even under constrained fiscal conditions. With a PPP portfolio at the level of 1-1.5% of GDP and a leverage ratio of 3-5, total investment volumes could reach 4-6%

⁴¹ UNDP. (2025). Ukraine – Fourth Rapid Damage and Needs Assessment (RDNA4) : February 2022 – December 2024. <https://www.undp.org/ukraine/press-releases/updated-damage-assessment-finds-524-billion-needed-recovery-ukraine-over-next-decade>

⁴² EIB Investment report 2025/2026. Capitalising on Europe's strengths (2026). *European Investment Bank Group*. <https://www.eib.org/files/publications/20250379-030326-investment-report-2025-en.pdf>

⁴³ Public-Private Partnerships and Investment in Infrastructure (2010). *OECD*. https://www.oecd.org/content/dam/oecd/en/publications/reports/2010/09/public-private-partnerships-and-investment-in-infrastructure_g17a1ecd/5km7jf6q8f0t-en.pdf

⁴⁴ OECD Principles for private sector participation in infrastructure (2007). *OECD*. https://www.oecd.org/content/dam/oecd/en/publications/reports/2007/07/oecd-principles-for-private-sector-participation-in-infrastructure_g1gh801a/9789264034105-en.pdf

⁴⁵ OECD Principles for private sector participation in infrastructure (2007). *OECD*. https://www.oecd.org/content/dam/oecd/en/publications/reports/2007/07/oecd-principles-for-private-sector-participation-in-infrastructure_g1gh801a/9789264034105-en.pdf

⁴⁶ Public-Private Partnerships and Investment in Infrastructure (2010). *OECD*. https://www.oecd.org/content/dam/oecd/en/publications/reports/2010/09/public-private-partnerships-and-investment-in-infrastructure_g17a1ecd/5km7jf6q8f0t-en.pdf

of GDP annually, enabling the coverage of up to 10-20% of reconstruction needs^{47, 48, 49}.

The economic significance of investment leverage extends beyond the expansion of capital volumes to include improvements in their efficiency. The combination of public and private financing creates incentives for more rational resource allocation, enhances project governance, and facilitates the adoption of innovative solutions. At a deeper level, the leverage effect is inherently institutional in nature. Its magnitude is determined by the volume of public resources as well as by the quality of the regulatory environment, the degree of trust among economic agents, and the predictability of economic policy.

Despite the significant potential for investment scaling, the use of PPPs is associated with the creation of contingent government liabilities, which pose potential risks to fiscal sustainability. These liabilities include revenue guarantees, availability payments, compensation mechanisms, and other forms of public support that may materialize into direct budgetary expenditure under adverse scenarios. In contemporary public finance theory, such obligations are treated as a latent component of public debt.

International experience indicates that, in the absence of adequate oversight, the volume of such liabilities may reach 3-6% of GDP, generating substantial risks to macro-financial stability. According to the IMF, in countries with underdeveloped fiscal risk management models, PPPs can give rise to significant contingent liabilities that are not reflected in current budget indicators but materialize over the medium and long term⁵⁰. The integration of PPPs into the medium-term fiscal planning system, together with the application of specialized assessment tools such as PFRAM (PPP Risk Assessment Model), allows these risks to be reduced to approximately 1-2% of GDP and ensures their effective management.

⁴⁷ UNDP. (2025). Ukraine - Fourth Rapid Damage and Needs Assessment (RDNA4) : February 2022 - December 2024. <https://www.undp.org/ukraine/press-releases/updated-damage-assessment-finds-524-billion-needed-recovery-ukraine-over-next-decade>

⁴⁸ EIB Investment report 2025/2026. Capitalising on Europe's strengths (2026). *European Investment Bank Group*. <https://www.eib.org/files/publications/20250379-030326-investment-report-2025-en.pdf>

⁴⁹ Public-Private Partnerships and Investment in Infrastructure (2010). *OECD*. https://www.oecd.org/content/dam/oecd/en/publications/reports/2010/09/public-private-partnerships-and-investment-in-infrastructure_g17a1ecd/5km7jff6q8f0t-en.pdf

⁵⁰ Pillar III: Fiscal risk analysis and management (2018). *IMF. Fiscal affairs dept.* <https://www.elibrary.imf.org/display/book/9781484331859/ch04.xml>

For Ukraine, this implies the need to establish a fiscally sustainable corridor for PPP deployment, within which a balance is maintained between investment mobilization and the control of budgetary risks. Such a corridor may be approximated at 1-5% of GDP in annual government commitments. The effectiveness of PPPs is therefore determined not solely by their capacity to generate investment leverage but by the state's institutional ability to manage the associated fiscal risks.

11.3. The economic effects of public-private partnerships in the process of green reconstruction of infrastructure in Ukraine

11.3.1. Methodological approach for assessing the investment and eco-economic efficiency of PPPs

In the context of analysing the institutional transformation of PPPs, the quantitative assessment of their economic effects becomes of central importance. Conventional approaches to infrastructure investment analysis, based on indicators such as net present value, internal rate of return, and budgetary efficiency, retain their analytical relevance; however, they do not fully capture the influence of the institutional environment on investment decision parameters. The proposed methodological approach is based on the integration of institutional, financial, and reproduction-related characteristics of infrastructure projects. This makes it possible to interpret investment efficiency not as a static outcome, but as a function of changes in the cost of capital, risk structure, and the quality of the regulatory environment^{51,52}.

To formalize the impact of institutional changes on investment decision-making, an investment viability index (IVI) is proposed. This index reflects the relationship between the expected economic returns of a project and the cost of capital employed:

$$IVI = \frac{R - C}{WACC},$$

where R denotes expected project revenues, C represents total costs (including capital and operational expenditures), and $WACC$ is the weighted average cost of capital. The proposed index enables investment decisions to be interpreted as directly dependent on the institutional environment. A reduction

⁵¹ Steffen, B. (2020). Estimating the cost of capital for renewable energy projects. *Energy Economics*, 88, 104783. <https://doi.org/10.1016/j.eneco.2020.104783>

⁵² EIB Investment report 2025/2026. Capitalising on Europe's strengths (2026). *European Investment Bank Group*. <https://www.eib.org/files/publications/20250379-030326-investment-report-2025-en.pdf>

in WACC, driven by increased regulatory predictability, improved risk allocation, and the application of public support instruments, leads to a corresponding increase in IVI. This shifts projects from a zone of investment uncertainty into a domain of economic viability. Accordingly, the regulatory transformation of PPPs acquires a measurable dimension through its impact on the investment viability of infrastructure projects.

Within the classical approach, the investment effect of PPPs is expressed as:

$$I_{tot} = B \cdot L,$$

where I_{tot} denotes the total volume of investment, B represents public financial commitments, and L is the investment leverage coefficient. This study extends the classical model by incorporating the cost of capital as a key institutionally determined parameter:

$$I_{tot} = B \cdot L(WACC).$$

In this formulation, WACC functions as an integral indicator of institutional quality. A reduction in the cost of capital – achieved through improvements in the regulatory improvement, enhanced investor confidence, and the development of public support mechanisms – generates a multiplicative expansion of the investment flow. Hence, institutional changes influence the investment process not solely through the volume of mobilized resources, but also through their cost, which ultimately determines the effective scale of investment mobilization.

In contemporary infrastructure economics, the cost of capital assumes a system-forming role, determining both the parameters of project financing and the very feasibility of investment implementation⁵³. In climate economics, this relationship acquires greater depth, as the effect trajectory of carbon pricing is determined by the discount rate and risk premium. This interpretation is consistent with contemporary theoretical approaches⁵⁴ and reflects the

⁵³ Steffen, B. (2020). Estimating the cost of capital for renewable energy projects. *Energy Economics*, 88, 104783. <https://doi.org/10.1016/j.eneco.2020.104783>

⁵⁴ Gollier, Ch. (2016). Fighting climate change and the social cost of carbon. *Climate, markets & finance*. <https://kleinmanenergy.upenn.edu/research/publications/fighting-climate-change-and-the-social-cost-of-carbon/>

inherently intertemporal nature of investment decision-making^{55, 56, 57}. Accordingly, financing conditions exert a direct influence on the feasibility of decarbonization projects.

The practical relevance of this approach may be illustrated by a stylized infrastructure project. Suppose that the development of a transport corridor requires an investment of \$5 billion, while the expected annual economic benefit – arising from reduced logistic costs, increased transit flows, and productivity gains – amounts to \$0.6 billion over a 20-year horizon. At a cost of capital of 12%, the project remains at the threshold of economic feasibility, whereas a reduction in WACC to 10% results in a positive net present value exceeding \$1 billion. This demonstrates that even marginal changes in the cost of capital, driven by institutional factors, may determine whether infrastructure projects are realized at all.

Table 2

Sensitive of project economic efficiency to WACC

WACC	Project NPV	Status
8%	+ \$ 1.5 billion	High efficiency
12%	+ \$ 0.3 billion	Marginal efficiency
16%	+ \$ 0.8 billion	Inefficiency

Source: author's calculations based on a discounted cash flow (DCF) model^{58, 59}

The results indicate that increases in the cost of capital exert a disproportionately strong effect on project feasibility. A rise in WACC from 12% to 16% effectively eliminates investment attractiveness. Investment decisions are determined by the general level of interest rates, while remaining highly sensitive to even marginal variations in financing conditions.

⁵⁵ Gollier, Ch. & Weitzman, L.M. (2009). How should the distant future be discounted when discount rates are uncertain? *CESifo working paper № 2863. Category 10: energy and climate economics*. https://www.ifo.de/DocDL/cesifo1_wp2863.pdf

⁵⁶ Edenhofer, O., Lessmann, K. & Tahri, I. (2024). Asset pricing and the carbon beta of externalities. *Journal of environmental economics and management*. <https://doi.org/10.1016/j.jeem.2024.102969>

⁵⁷ Gollier, Ch. (2024). The cost-efficiency carbon pricing puzzle. *Journal of environmental economics and management*. <https://doi.org/10.1016/j.jeem.2024.103062>

⁵⁸ EIB Investment report 2025/2026. Capitalising on Europe's strengths (2026). *European Investment Bank Group*. <https://www.eib.org/files/publications/20250379-030326-investment-report-2025-en.pdf>

⁵⁹ Public-Private Partnerships and Investment in Infrastructure (2010). *OECD*. https://www.oecd.org/content/dam/oecd/en/publications/reports/2010/09/public-private-partnerships-and-investment-in-infrastructure_g17a1ecd/5km7jf6q8f0t-en.pdf

Table 3

Effect of a 1% point reduction in WACC on project

Indicator	WACC=12%	WACC=11%	Effect
PV of costs, billion USD	1.00	0.88	Reduction by 0.12 billion USD
NPV, billion USD	0.10	0.22	Increase by 0.12 billion USD
IRR, %	12.5	13.7	Increase by 1.2 pp
Investment status	Threshold	Financially viable	Transition to a qualitatively improved investment state

Source: author's calculations ^{60, 61}

The results demonstrate that a reduction in the cost of capital by just 1 percentage point leads to a decline in discounted project costs of approximately 10-12%, alongside a comparable increase in NPV. This leads to a qualitative transition of the project from marginal viability to a state of stable investment attractiveness. Thus, institutional mechanisms aimed at reducing the cost of capital – particularly through enhanced regulatory predictability, efficient risk allocation, and the application of public support instruments within PPP arrangements – have a direct and quantitatively measurable impact on the implementation of infrastructure projects in the context of green reconstruction.

11.3.2. Sectoral Structure of Investment Needs and the Economic Effects of PPPs in Their Coverage

The institutional transformation of PPPs acquires tangible economic significance in the context of Ukraine's post-war reconstruction, where the critical factor is the relationship between the scale of investment needs and the capacity to finance them. According to estimates by international organizations, infrastructure reconstruction spans key sectors – transport, energy, and municipal utilities – thus generating a systemic and multidimensional demand

⁶⁰ Steffen, B. (2020). Estimating the cost of capital for renewable energy projects. *Energy Economics*, 88, 104783. <https://doi.org/10.1016/j.eneco.2020.104783>

⁶¹ EIB Investment report 2025/2026. Capitalising on Europe's strengths (2026). *European Investment Bank Group*. <https://www.eib.org/files/publications/20250379-030326-investment-report-2025-en.pdf>

for investment resources ⁶², ⁶³. The structure of these needs encompasses both the restoration of destroyed assets and the transition towards a new development model oriented towards enhanced energy efficiency, reduced carbon intensity, and integration into the European economic space. In this context, infrastructure functions not merely as an object of investment but as a fundamental determinant of long-term productivity and economic competitiveness. International experience demonstrates that infrastructure investment plays a decisive role in shaping economic growth trajectories and constitutes a major channel for mobilizing private capital into strategic sectors ⁶⁴, ⁶⁵.

Across sectors, investment needs exhibit distinct characteristics, which in turn determine the corresponding economic effects of PPP deployment. In the transport sector, the primary effect is associated with improved efficiency in the utilization of infrastructure capital and the reduction of logistic costs. The modernization of transport networks, the development of multimodal solutions, and the digitalization of flow management contribute to shorter transit times, lower fuel consumption, and the optimization of logistic chains. In this context, the transformation of transport infrastructure aligns with European approaches to climate policy implementation, under which the development of transport systems is conceptualised as a central mechanism for achieving decarbonisation targets and improving the structural sufficiency of the economy ⁶⁶. These improvements directly enhance export competitiveness, expand transit potential, and facilitate integration into international markets.

In the energy sector, PPPs serve as a mechanism for structural transformation and enhance system resilience. Investments in generation, distribution, and energy storage contribute to diversification of supply sources, reduced import dependence, and enhanced energy security. At the same time, the implementation of energy-efficient technologies leads to lower production and consumption costs.

⁶² UNDP. (2025). Ukraine - Fourth Rapid Damage and Needs Assessment (RDNA4) : February 2022 - December 2024. <https://www.undp.org/ukraine/press-releases/updated-damage-assessment-finds-524-billion-needed-recovery-ukraine-over-next-decade>

⁶³ Government of European Union; Nations, United. Ukraine: Rapid Damage and Needs Assessment (RDNA4) (2025). February 2022 – December 2024. (Ukrainian). Washington, D.C.: *World Bank Group*. <http://documents.worldbank.org/curated/en/099052925103531065>

⁶⁴ EIB investment survey 2023. European Union Overview (2023). *European Investment Bank*. https://www.eib.org/attachments/lucalli/20230285_econ_eibis_2023_eu_en.pdf

⁶⁵ EIB Investment report 2025/2026. Capitalising on Europe's strengths (2026). *European Investment Bank Group*. <https://www.eib.org/files/publications/20250379-030326-investment-report-2025-en.pdf>

⁶⁶ Koralova-Nozharova, P. (2021). European Green Deal and transport sector development – opportunities or restrictions. SHS Web Conf. *Business and regional development* 2021, 120, 04004. <https://doi.org/10.1051/shsconf/202112004004>

Table 4

**Sectoral parameters of infrastructure investment needs
and the potential for PPP-based coverage**

Sector	Investment needs, billion USD	Role of PPP	Economic effect
Transport	~ 70-80	Concession, DBFO	Enhanced efficiency of logistic systems
Energy	~ 60-70	Generation and grids	Reduction in energy imports
Municipal utilities	~ 80+	Tariff-based modernization	Reduction in resource losses

Source: author's compilation based on ^{67, 68, 69}

Within the municipal utilities sector, the economic effect of PPPs assumes an integrated character, combining economic and social outcomes. The modernization of heating, water supply, and waste management systems reduces resource losses, improves service quality, and generates long-term savings for households and local budgets. In addition, such investments generate a multiplier effect at the local level through the stimulation of related industries and increased investment activity.

In summary, across all sectors, the economic effects of PPPs are closely intertwined with environmental outcomes. Reductions in energy consumption, optimization of transport flows, and infrastructure modernization translate directly into lower emissions and improved resource efficiency. Thus, PPP functions not merely as a mechanism for mobilizing financial resources but as an instrument for integrating economic and environmental objectives within the process of infrastructure development. Their application enables a transition from fragmented reconstruction efficiency to a systemic transformation of infrastructure, combining economic efficiency with long-term environmental sustainability.

⁶⁷ UNDP. (2025). Ukraine - Fourth Rapid Damage and Needs Assessment (RDNA4) : February 2022 - December 2024. <https://www.undp.org/ukraine/press-releases/updated-damage-assessment-finds-524-billion-needed-recovery-ukraine-over-next-decade>

⁶⁸ EIB Investment report 2025/2026. Capitalising on Europe's strengths (2026). *European Investment Bank Group*. <https://www.eib.org/files/publications/20250379-030326-investment-report-2025-en.pdf>

⁶⁹ Public-Private Partnerships and Investment in Infrastructure (2010). *OECD*. https://www.oecd.org/content/dam/oecd/en/publications/reports/2010/09/public-private-partnerships-and-investment-in-infrastructure_g17a1ecd/5km7jf6q8f0t-en.pdf

Sectoral effects of PPP implementation are generalized through the formation of an investment-fiscal multiplier, which reflects the capacity of this mechanism to scale the economic impact of public expenditure. Unlike the classical Keynesian multiplier, which is driven by aggregate demand expansion, the PPP multiplier has an institutional-investment nature. It emerges from the interaction of three interrelated factors: the mobilization of private capital, the reduction in the cost of financing, and the improvement in the efficiency of resource utilization. In quantitative terms, this effect is realized through investment leverage, whereby each unit of public resources generates three to five units of total investment. Combined with enhanced project efficiency, this results in a substantially greater aggregate economic outcome compared to direct budgetary financing.

At the macroeconomic level, this translates into the potential for additional GDP growth through increased productivity of infrastructure capital, reduced logistic and energy costs, and the stimulation of private investment activity. However, the realization of this potential is subject to clearly defined institutional constraints. Despite its significant economic potential, the application of PPPs in Ukraine is constrained by a number of systemic limitations. A key constraint is the absence of a well-developed pipeline of bankable investment projects that meet investor requirements in terms of risk and return. The existence of a regulatory system without a corresponding project base does not ensure capital mobilization. Another major limitation lies in the insufficient development of information infrastructure. The absence of integrated data on emissions, energy consumption, and infrastructure performance increases uncertainty, which is directly reflected in a higher cost of capital. An additional constraint arises from the fragmentation of economic policy, whereby fiscal, tariff, investment, and sectoral instruments operate in isolation rather than forming a coherent system of incentives. This reduces the feasibility of implementing complex infrastructure projects and undermines investor confidence.

Thus, the investment-fiscal multiplier of PPPs possesses not only an economic but also an institutional character: its magnitude is determined primarily by the quality of the environment in which public resources are deployed. In the absence of appropriate institutional conditions, the potential of investment leverage remains only partially realized, thereby limiting the effectiveness of PPPs as an instrument of economic policy. Only under such conditions can PPPs evolve from a tool for implementing individual projects into a systemic mechanism of economic development.

11.3.3. Institutional Transmission Mechanisms of Economic and Environmental Effects in Infrastructure Investment

In contemporary climate economics, the environmental effect of infrastructure investment does not arise as an autonomous outcome of technological change but is shaped by the financial parameters of the investment process. According to modern theoretical approaches, the effective trajectory of carbon pricing is determined by the level of the discount rate and the expected return on capital⁷⁰. This implies that the cost of capital functions as a system-forming element of climate policy, through which the feasibility, scale, and pace of low-carbon infrastructure deployment are determined.

The study substantiates that the environmental effect of infrastructure investment is derivative of its economic realization. In this regard, the following conceptual relationship is proposed:

$$E_{green} = f(I_{integr}, WACC, S),$$

where E_{green} denotes the environmental effect, I_{integr} represents the degree of integration of infrastructure systems, $WACC$ represents the cost of capital, and D captures the structural characteristics of infrastructure.

Under this interpretation, environmental outcomes are not viewed as a direct consequence of technological implementation but as an integrated effect arising from the interaction of institutional, financial, and structural factors. This perspective fundamentally reorients the evaluation of infrastructure projects, shifting the analytical focus from technological attributes to the parameters of the investment environment. The proposed methodological approach enables a transition from descriptive analysis of PPPs to a formalised assessment of their economic effectiveness. Its defining feature lies in the integration of the institutional dimension into the financial parameters of infrastructure projects. Within this approach, the regulatory transformation of PPPs is not treated as a formal change in rules but as a factor directly influencing the cost of capital, the investment viability of projects, the scale of investment mobilization, and both the economic and environmental effectiveness of reconstruction. Institutional parameters thereby constitute a key transmission channel through which financial mechanisms are translated into long-term environmental outcomes.

In the context of Ukraine's post-war economic transformation, PPPs assume the role not merely of a financial instrument but of a structural component in

⁷⁰ Gollier, Ch. (2018). On the efficient growth rate of carbon price under a carbon budget. *Toulouse school of economics*. <https://www.tse-fr.eu/sites/default/files/TSE/documents/sem2018/environment/gollier.pdf>

shaping a new model of infrastructure development. Their effectiveness is determined not by the isolated characteristics of individual projects but by the degree of integration within the broader system of economic policy, where environmental objectives, investment mechanisms, and institutional conditions are jointly aligned. Against this backdrop, the development of an integrated PPP model is proposed, capturing the interconnections between transformation objectives, implementation mechanisms, and economic outcomes. The model is based on the premise that environmental transformation of infrastructure is achieved not through isolated projects but through a system of institutionally coordinated decisions that ensure the reduction of the cost of capital, the mobilization of private investment, and the optimization of resource utilization. Structurally, the model can be represented as a three-level system.

At the strategic level, the core transformation objectives are defined, including the decarbonization of transport and energy systems, improvements in energy efficiency, reduction of resource losses, and integration into the European economic space. This level generates the demand for investment.

The infrastructure level reflects the implementation of these objectives through the formation of integration systems, including transport corridors, energy networks, logistics hubs, and digital platforms for flow management. Economic efficiency at this level emerges not from individual assets but from the quality of their interaction.

The institutional-financial level ensures the implementation of infrastructure solutions through PPP mechanisms, public support instruments, blended finance, and the regulatory environment. At this level that the parameters of the cost of capital and the accessibility of financing are determined.

A defining feature of the model is the interdependence of its levels, which can be summarized in the logical chain. This relationship reflects a systemic causal linking institutional quality to reduced capital costs, expanded investment, improved infrastructure efficiency, and subsequent reductions in resource consumption and emissions. The economic substance of the model lies in the proposition that environmental outcomes in modern infrastructure systems arise not solely from technological change but from institutionally enabled transformations in the structure of economic interactions.

The practical relevance of the model consists of enabling a shift from a project-based to a systemic approach to infrastructure reconstruction, aligning investment decisions with environmental objectives, and evaluating the effectiveness of institutional reforms through their impact on the cost of capital. In this context, PPPs are embedded within the system of economic policy not as a standalone instrument but as a mechanism that ensures the interconnection between institutional quality, investment processes, and environmental outcomes.

11.4. Institutional Determinants of the Cost of Capital in Infrastructure Projects

Regulatory certainty constitutes a fundamental precondition for reducing the cost of capital in infrastructure projects. The presence of inconsistent procedure, duplication of regulatory requirements, and instability in the rules governing interactions between the public and private sectors generates uncertainty regarding future cash flows, which is directly reflected elevated risk premium. The regulatory transformation of PPPs is aimed at mitigating these effects through the unification of procedures, the recognition of PPPs as a distinct legal regime, and the standardization of contractual arrangements. The economic outcomes of these changes is manifested in reduced transaction costs and lower regulatory risk, which directly affects both the cost of debt and equity financing.

Table 5

The impact of institutional parameters on the cost of capital in infrastructure projects

Institutional parameter	Economic effect	Impact of WACC
Regulatory certainty	Reduced uncertainty of cash flows	Reduction of risk premium
Transparent procedures	Lower transaction costs	Reduction of preparation costs
Policy stability	Reduced long-term risks	Reduction of discount rate
Investor protection	Increased confidence	Reduction in cost of debt

Source: author's compilation based on ^{71, 72, 73, 74}

⁷¹ Government of European Union; Nations, United. Ukraine: Rapid Damage and Needs Assessment (RDNA4) (2025). February 2022 – December 2024. (Ukrainian). Washington, D.C.: *World Bank Group*. <http://documents.worldbank.org/curated/en/099052925103531065>

⁷² Kim, Jay-Hyung, Fallov, Jonas Arp, & Groom, Simon. (2020). Public Investment Management Reference Guide. *World Bank Group*. <https://documents1.worldbank.org/curated/en/548751582775237521/pdf/Public-Investment-Management-Reference-Guide.pdf>

⁷³ EIB Investment report 2025/2026. Capitalising on Europe's strengths (2026). *European Investment Bank Group*. <https://www.eib.org/files/publications/20250379-030326-investment-report-2025-en.pdf>

⁷⁴ Public-Private Partnerships and Investment in Infrastructure (2010). *OECD*. https://www.oecd.org/content/dam/oecd/en/publications/reports/2010/09/public-private-partnerships-and-investment-in-infrastructure_g17a1ecd/5km7jf6q8f0t-en.pdf

An equally important institutional element is the mechanism of risk allocation. From the perspective of contract theory, efficient risk allocation implies assigning risks to the party best able to manage them at the lowest cost.

Table 6

Risk allocation and its impact on financing

Type of risk	Efficient allocation	Economic effect
Construction	Private partner	Reduction in implementation costs
Demand	Public / shared	Reduction in revenue uncertainty
Operational	Private partner	Improvement in operational efficiency
Political	Public sector	Reduction in risk premium

Source: author's compilation on ^{75, 76, 77}

An efficient risk configuration leads to the capitalization of risks within financing costs, reflected in higher risk premium and, consequently, an increased WACC. Conversely, institutionally grounded risk allocation cash flows, enhanced project creditworthiness, and reduces the cost of capital.

A third element is public support, which in the modern PPP practice functions as a mechanism for correcting market failures. Its economic role lies in smoothing cash flows, reducing revenue risk, and enhancing the credit quality of projects.

In summary, the regulatory transformation of PPPs generates a comprehensive economic effect, realized through several interrelated channels: the reduction of regulatory uncertainty, the optimization of risk allocation, the application of public support instruments, and the strengthening of investor confidence. As a result, a systemic reduction in the cost of capital occurs, which in quantitative terms may amount to a decrease of 1-5 percentage points in WACC. As demonstrated in the previous section, even such a change leads to a reduction in discounted costs by 10-15%, and is sufficient to shift infrastructure projects from marginal efficiency into a zone of investment viability. The economic implications of institutional change extend beyond the reduction of financing costs for individual projects. Through the mechanism of

⁷⁵ Yescombe, E.R. (2007). *Public-private partnerships: principles of policy & finance*: monograph. Butterworth-Heinemann. ISBN: 978-0750680547. <https://doi.org/10.1016/B978-0-7506-8054-7.X5022-9>

⁷⁶ Public-private partnerships Reference guide. (2017). *The World Bank*. <https://ppp.worldbank.org/sites/default/files/2024-08/PPP%20Reference%20Guide%20Version%203.pdf>

⁷⁷ Public-Private Partnerships and Investment in Infrastructure (2010). *OECD*. https://www.oecd.org/content/dam/oecd/en/publications/reports/2010/09/public-private-partnerships-and-investment-in-infrastructure_g17a1ecd/5km7jf6q8f0t-en.pdf

investment leverage, these changes expand the total volume of investment that can be realized within existing fiscal constraints.

Table 7

Public support instruments and their impact

Instrument	Economic effect	Impact on WACC
Availability payments	Stable cash flows	Reduction in overall project risk
Minimum revenue guarantees	Reduction in demand risk	Reduction in lending rates
State guarantees	Improvement in credit rating	Reduction in cost of debt

Source: author's compilation on ^{78, 79, 80}

Thus, institutional quality emerges as a key determinant of financing accessibility, investment scale, and the pace of green infrastructure transformation. It is through this channel that regulatory policy is translated into concrete investment decisions and, ultimately, into long-term economic and environmental outcomes.

CONCLUSIONS

The conducted study substantiates that, under the conditions of Ukraine's post-war economic transformation. PPP acquires the status of a system-forming mechanism for the implementation on an investment-driven model of infrastructure development. It is established that, in the presence of a structural gap between the scale of investment needs and the capacity of budgetary financing, PPP performs the function of overcoming the intertemporal budget constraint by transforming limited public resources into an expanded capital flows through the mechanism of investment leverage.

The finding demonstrate that the institutional transformation of PPP fundamentally alters its economic nature, shifting it from an instrument of episodic private capital mobilisation to a structured mechanism of long-term investment with controlled fiscal implications. A key outcome of this

⁷⁸ Yescombe, E.R. (2007). *Public-private partnerships: principles of policy & finance*: monograph. Butterworth-Heinemann. ISBN: 978-0750680547. <https://doi.org/10.1016/B978-0-7506-8054-7.X5022-9>

⁷⁹ Public-private partnerships Reference guide. (2017). *The World Bank*. <https://ppp.worldbank.org/sites/default/files/2024-08/PPP%20Reference%20Guide%20Version%203.pdf>

⁸⁰ Pillar III: Fiscal risk analysis and management (2018). *IMF. Fiscal affairs dept.* <https://www.elibrary.imf.org/display/book/9781484331859/ch04.xml>

transformation lies in the reduction of institutional risk, which is directly transmitted into the cost of capital and determines the financial viability of infrastructure projects. The analysis confirms that the cost of capital constitutes the principal transmission channel through which institutional parameters of the economy are converted into actual investment decision. A reduction in WACC, even within the range of 1-1.5 percentage points, ensure a qualitative shift of a substantial share of infrastructure projects into the zone of investment viability, which is of critical importance for the implementation of capital-intensive green modernization initiatives.

It is shown that the economic effect of PPP exhibits a multiplicative character, materialising in the form of an investment-fiscal multiplier, whereby each unit of public resources mobilises a multiple volume of private capital. This effect is inherently institutional and investment-driven, reflecting the combined influence of financial, regulatory, and organisational factors.

Sectoral analysis indicates that the application of PPP contributes to improved efficiency of infrastructure capital and generates an integrated economic and environmental outcome, manifested in enhanced logistics and energy efficiency, improved service quality, and simultaneous reductions in emissions and resource losses. This substantiates the role of PPP as an instrument for aligning economic and climate objectives of development. The study reveals that the realisation of PPP potential is constrained less by deficiencies in the regulatory system than by the absence of a coherent institutional environment for its operation. Persistent limitations include the lack of a well-developed project pipeline, insufficient data infrastructure, and the fragmentation of economic policy, all of which increase the cost of capital and suppress investment activity.

In this regard, the effectiveness of PPP is determined not by the formal existence of institutional instruments, but by the state's capacity to ensure their systemic integration into the broader architecture of economic policy. Under such conditions, PPP evolves from a financial instrument into a key channel linking institutional quality, investment dynamics, and environmental outcomes, thereby forming the foundation for a transition towards a reproduction-based model of infrastructure development in Ukraine.

SUMMARY

The article examines the institutional and economic foundations of public-private partnership (PPP) in the context of Ukraine's post-war green reconstruction of infrastructure. It identifies a structural gap between the scale of investment needs and the limited capacity of budgetary financing as a key

challenge, necessitating the systemic mobilisation of private capital. The study substantiates that the institutional quality of the PPP environment determines the cost of capital through the mechanisms of risk premium and transaction costs. It demonstrated that a reduction in the weighted average cost of capital constitutes the principal channel through which institutional changes are translated into actual investment decision and the financial viability of infrastructure projects.

A methodological approach to the assessment of PPP effectiveness is developed based of the integration of the WACC-NPV-investment effect relationship. The finding show that PPP generates an investment-fiscal multiplier, enabling the scaling of investments through financial leverage. The economic effect of PPP is shown to be multidimensional and closely linked to environmental outcomes, particularly in terms of reduced carbon intensity and improved resources efficiency.

An integrated model of PPP functioning is proposed, capturing the interdependence between institutional quality, cost of capital, investment scale, and environmental performance. The study further demonstrates that the effectiveness of PPP is determined not solely by the regulatory framework, but by the coherence of the broader institutional environment, including the availability of a project pipeline, data infrastructure, and coordinated economic policy. The results support the interpretation of PPP as a key mechanism for aligning economic and climate objectives in the development of Ukraine's infrastructure system.

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