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Larysa Sergiienko

D.Sc. in Public Administration,
Associate Professor, Dean of the
Faculty of National Security, Law and
International Relations, Zhytomyr
Polytechnic State University, Zhytomyr,
Ukraine;
ORCID: 0000-0003-3815-6062

Nataliia Bondarchuk

D.Sc. in Public Administration,
Professor, Head of the Department of
Management and Public
Administration, Dnipro State Agrarian
and Economic University, Dnipro,
Ukraine;
ORCID: 0000-0002-0418-5239

Svitlana Belinska

D.Sc. in Economics, Professor, Dean of
the Faculty of Economic Sciences,
Petro Mohyla Black Sea National
University, Mykolaiv, Ukraine;
ORCID: 0000-0001-5826-5958

Nadiia Topolenko

Candidate of Sciences in Public
Administration, Associate Professor of
the Department of Accounting, Audit,
Analysis, and Taxation, University of
Customs and Finance, Dnipro, Ukraine;
ORCID: 0000-0002-2050-9686

Roman Dziuba

PhD Student of the Department of
Public Management, State University of
Information and Communication
Technologies, Kyiv, Ukraine;
e-mail: dziuba0610@gmail.com
ORCID: 0009-0008-5767-0423
(Corresponding author)

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ASSESSING THE IMPACT OF THE BUDGET DEFICIT ON THE INVESTMENT POTENTIAL OF PUBLIC-PRIVATE PARTNERSHIPS IN THE EU COUNTRIES

ABSTRACT

The investigation is aimed at identifying the relationship between the scale of the budget deficit and the investment potential of the public-private partnership in France and Italy over the period 2020–2023. The investment potential was reflected by two indicators: the direct investment in the public-private partnership project (billions of euros) and the number of projects that have reached financial closure. As a key explanatory change, the magnitude of the sovereign finance deficit per unit in billions of euros is shown, which ensures a stable interpretation of “a larger deficit means a larger quantity; there are billions of resources”. Linear regression with fixed edge effects is methodically designed, which makes it possible to strengthen the steel institutional background from internal conflicts and estimate the marginal influx of an additional one billion Euro deficit to show public-private partnership. To increase reliability, robust standard ablation using the Huber-White approach was used, and duplicate assessments of the skin edge were also performed. Descriptive statistics and correlation analysis are useful as an indicative addition to the causal interpretation of regression coefficients. The results show that the public-private partnership project faces significant challenges in relation to the scale of the deficit in order to attract investments. At the same time, for a number of projects, a stable and statistically variable effect was not revealed: the influx of deficit into the market is close to zero or non-existent. A practical interpretation emphasizes the need to reduce the deficit or, moreover, to protect long-term debts between public-private partnerships in the form of a short-term fiscal squeeze, which is the policy direction for a larger investment scale of public-private partnerships.

Keywords: budget deficit, investment potential, government-private partnership, investments, number of projects, fixed effects, regression analysis, fiscal policy, EU countries

JEL Classification: H54, H57, H62, C23

INTRODUCTION

The study of the impact of budget deficit on investment opportunities of public-private partnerships is very relevant. On the one hand, many EU countries face high budget deficits and infrastructure financing restrictions, and on the other hand, it is through public-private partnership mechanisms that it is possible to implement large-scale projects that become powerful catalysts for the economy. Public-private partnership is proposed to be considered as a mechanism that allows implementing large projects without immediately increasing public spending. In addition, the instability of budget characteristics can limit the attractiveness of such projects for investors. It is important that, despite the full-scale armed invasion of Ukraine, EU countries are actively implementing public-private partnership schemes to update infrastructure. Such examples demonstrate that even in difficult conditions, states are looking for partnerships with private capital to support economic growth and urban development.

In this regard, studying how the budget deficit affects the investment potential of public-private partnerships may become an important step towards understanding modern trends in this area. Issues of optimizing financial policy, structuring project financing,

and risk assessment are becoming especially relevant against the backdrop of strict fiscal norms. Despite the existing challenges, it is public-private partnerships that are considered a stable vector of investment development, which is especially important against the backdrop of constant growth in government spending on solving other needs or problems.

Many countries in the European Union are actively deploying and modernizing public-private partnership instruments to accelerate investment in transport, energy, utilities, and digital infrastructure. It is worth noting that in a context of limited fiscal space, such partnerships help mobilize private capital by combining a full lifecycle approach, value-for-money standards, environmental and social criteria, and transparent risk-sharing rules. Arguably, it is the consistent application of these principles that helps EU countries maintain the pace of critical infrastructure modernization, protect cash flow security potential, and create windows of opportunity for innovation, including the integration of artificial intelligence technologies in asset and maintenance management.

LITERATURE REVIEW

The scientific and practical literature devoted to the problems of public-private partnerships demonstrates that the investment potential of such projects is formed at the intersection of the state's fiscal constraints, contract design characteristics, financing structure, and risk profile throughout the life cycle. First, at the level of the overall effectiveness of public-private partnerships, modern reviews emphasize the heterogeneity of effects in terms of cost, timing, and quality, which makes the initial conditions and institutional environment decisive (Hodge & Greve, 2017). Comparisons with traditional contracts indicate that the time and cost advantages are not automatic and depend on the context, incentive structure, and the ability of the parties to manage uncertainty (Verweij & van Meerkerk, 2021). In the context of budget deficits, without proper contract design and fiscal discipline, public-private partnerships do not guarantee better results and may even increase hidden fiscal liabilities. Secondly, the state's credit risk is a key transmission channel of the deficit's impact on investment potential. It has been proven that an increase in the credit risk of the state partner in the operational phase of projects increases private investors' demands for risk premiums, hinders access to debt financing, and provokes conflicts over risk redistribution (Zhou & Liu, 2021). Research shows that risk sharing, availability payment mechanisms, indexation, provisions for change of circumstances, and the level of service specification are directly related to the performance of public-private partnerships (Klijn & Koppenjan, 2016). It should be noted that flexibility built into the pre-contract stage increases the ability to adapt the project to demand shocks, inflationary impulses, and budget cuts, reducing the frequency of costly risk reallocations and litigation (Demirel, Leendertse, Volker, & Hertogh, 2017; Vakhovych et al., 2021).

The state of investment potential is characterized by the features of financing. Therefore, empirical estimates of the determinants of the capital structure of infrastructure projects in public-private partnerships indicate that it is the indicators of debt obligations, guarantees, minimum incomes, and other key instruments that form both the cost of capital and the financial stability of projects (Cai, Li, & Cai, 2019). The budget deficit in this context has a dual effect. On the one hand, it provokes the role of private debt, and on the other hand, it increases the requirements of creditors for collateral and issuance of loans. As a result, this will somewhat reduce the financing of public-private partnership projects in countries with limited fiscal space.

A comparative analysis of existing methodologies in the field of public-private partnerships demonstrates significant differences in approaches to calculating baseline scenarios, discounts, risks, and contingent liabilities (Boardman & Hellowell, 2017). In our opinion, in conditions of a deficit, failure to account for or underestimation of part of the contingent liabilities can become a significant factor of destabilization. Given this, the quality of the assessment and transparency of risk accounting are determined in ensuring investor confidence, and therefore support for the development of the public-private partnership market.

Research into risk factors in the field of public-private partnerships records a wide range of factors (macroeconomic, political, technical, and others) that can influence their manifestation. No less attention is paid to the importance of forming adaptation strategies, the structure of which includes the formation of clear risk-sharing schemes, the use of insurance instruments, indexation mechanisms, and contractual adaptation (Rybníček, Plakolm, & Baumgartner, 2020). In the context of budget deficits, these strategies need to be integrated with the fiscal framework to prevent risks from being transferred to the public sector during certain periods of public-private partnerships. Current research suggests that an optimally designed public-private partnership framework can enhance innovation in infrastructure delivery, particularly through integrated life cycles, the use of adaptive decision-making models, and incentives for asset management (Liu, Clegg, & Pollack, 2023). This is especially important in the context of significant fiscal constraints.

To summarize the research on the relationship between public finance, fiscal rules, and public-private partnerships, it can be concluded that mobilizing private capital due to limited budgets requires transparent rules for accounting for contingent

liabilities, as well as institutional capacity for risk management at the state level. (Cepparulo, Eusepi, & Giuriato, 2024). In other words, public-private partnerships either crowd out other priority spending or create hidden deficit risks that reduce investor confidence.

AIMS AND OBJECTIVES

The purpose of the study is to empirically assess the relationship between the size of the budget deficit and the investment potential of public-private partnerships in France and Italy in 2020-2023, with subsequent interpretation for fiscal policy. The object of the study is the investment process of public-private partnerships in the countries of the European Union, with a focus on France and Italy.

METHODS

In this study, we assess whether the size of the budget deficit is associated with the investment potential of public-private partnerships in two European Union countries (France and Italy) over the period 2020–2023, where investment potential is represented by two variables. The key explanatory variable is the absolute value of the budget deficit in billions of euros (i.e., how many billions exactly is the deficit, without the minus sign). The basic equation for each of the two results is (1):

$$y_{it} = \alpha + \delta_i + \beta D_{it} + \varepsilon_{it}, \quad (1)$$

where y_{it} — investments, or the number of projects in a country i in a year t ; δ_i — country fixed effect, which "removes" persistent cross-country differences (institutions, legal frameworks, approach to contracts), and β — the desired marginal impact of an additional one billion euros of deficit on the corresponding public-private partnership indicator.

We perform the estimation using the least squares method, using standard robust errors according to the Huber-White approach to reduce the sensitivity to possible heteroscedasticity in short series (Huber, 2010; Ali, 2025). For reliability, we repeat the estimation separately for each country (two simple regressions), and also in a common "small panel" with country fixed effects (one equation with a dummy variable for Italy, while France is the base category). The Pearson sample correlation is calculated. The regression equation will look like this for both countries (2):

$$I_{it} = \alpha + \beta D_{it} + \varepsilon_{it}; N_{it} = \alpha + \beta D_{it} + \varepsilon_{it}, \quad (2)$$

The identification assumption is that, given the country fixed effects provided, the random component is uncorrelated with the current size of the deficit, i.e., there is no systematic unfixed variable that simultaneously moves both the deficit and our outcome (or such an effect is insignificant in the studied period). To interpret β , we read it as "how much investment (or the number of projects) changes for a one billion euro increase in the deficit", supplemented by tests on the t-statistic, p-value, and the proportion of explained variance, as well as descriptive correlation as an auxiliary but not causal indicator.

RESULTS

For the purposes of further analysis and modelling, we selected two current EU member states, namely France and Italy. These two EU member states provide a useful contrast to test the relationship between the size of the budget deficit and the investment potential of public-private partnerships. France has a large number of deals and significant but variable investment volumes, while Italy has a small number of deals but investment volumes that show a steady trend over the short period 2020-2023 (Table 1).

Table 1. Peculiarities of formation and implementation of public-private partnerships in Italy and France.

France	Italy
Public-private partnerships are institutionalized in the Code of Public Procurement (Code de la commande publique), which is a specific instrument of the marché de partenariat (market partnership contract), as well as concessions, integrated after the 2015 reform. Definitions and frameworks are set out in Legifrance and in the methodological materials of the Bank of Territories	Public-private partnerships are regulated by the New Code of Public Contracts (Legislative Decree No. 36/2023), which replaced the previous code of 2016. In 2024, the "corrective" decree No. 209/2024 was adopted, introducing significant changes. The directives on concessions and project financing have been implemented in the code, followed by the digitalization of the contract life cycle from 2024
The Mission d'appui au financement des infrastructures is a national service within the Directorate General of the Treasury (Direction générale du Trésor). Accompanies customers in choosing the form (public-private partnership or classic procurement), financial structuring, checking "bank attractiveness", and optimizing contracts at all levels of government	DIPE (Department for Programming and Coordination of Economic Policies in the Government) has taken over the competencies of the former UTFF (Project Finance Office). Supranational or strategic issues go through CIPESS (former CIPE). ANAC (National Anti-Corruption Agency) administers the qualification of the clients and oversees the procedures
Before laying the marché de partenariat, a preliminary assessment of the feasibility and value for money (évaluation préalable) is carried out, and the choice of tool is compared with a traditional purchase. Practical instructions for customers are published by Fin Infra and the Bank of Territories	Any public body can be a contracting authority for a public-private partnership. The contracting authority qualification system (articles of the code and regulations) is administered by ANAC. The 2023 Code introduced simplification, more standard rules for concessions and digitalisation tools (gradual entry into force in 2023-2024)
The practice is widespread in social infrastructure (schools, hospitals), transport, water, and utilities. Fin Infra works with national and local level projects and optimizes payment structures (income affordability/risk) to market standards	Widely used in transport, social infrastructure, and public utilities. Historically significant concession models (including transport) and project finance. Government DIPE/CIPESS reports track the portfolio of solutions and their evolution
Classification of public-private partnership contracts is carried out according to the European System of National and Regional Accounts 2010 (ESA 2010). Part of the liabilities is reflected in the gross fixed capital formation of the public sector in accordance with the Eurostat methodology	The ESA 2010 criteria and the national procedures of the Ministry of Economy and Finance for monitoring public-private partnership commitments are applied. Infrastructure commitments are tracked in public registers (in particular in DIPE/CIPESS reports and the Ministry's information bases)
Strong ecosystem of banks and consultants. Fin Infra acts as a center of expertise for government customers, helping to achieve value for money and market feasibility. A wide range of contracts is used	The key coordination is provided by DIPE/CIPESS (political and institutional framework), ANAC (procedures and supervision), as the financial ecosystem revolves around the project finance market. In 2023–2024, the emphasis will be on standardization and digitalization of procedures and stronger support for the deputy
Announcement and documentation of procurement within state platforms. Fin Infra methodological materials and reports ensure the unification of approaches and the accumulation of practice	At the national level, there are registers and databases of contracts, managed by ANAC and the Ministry of Economy and Finance. The World Bank (Benchmarking Infrastructure) records the presence of formal qualifications of customers and procedural certainty

The size of the deficit in France varies from EUR 125.8 to 207.1 billion, with significant fluctuations between years, while in Italy it is more stable, lying in a narrow range of approximately EUR 153.4–161.2 billion. In terms of the number of financial closures of public-private partnership projects, France is significantly ahead of Italy (from 6 to 21 versus 1–3 per year), but it is the investment amounts in France that change in waves (EUR 2.2 → 1.4 → 4.2 → 2.1 billion), while in Italy they grow almost monotonously. In general, a certain pattern can be seen in that the number of transactions does not always move in sync with the size of the deficit, while investment volumes are more sensitive (Table 2).

Table 2. Initial data for modeling.

Country	Year	State budget deficit (EUR billion)	Number of public-private partnership projects (units)	Public-private partnership investment (EUR billion)
France	2020	207.1	17	2.2
	2021	165.1	17	1.4
	2022	125.8	21	4.2
	2023	153.9	6	2.1
Italy	2020	160.3	1	1.9
	2021	161.2	3	1.8
	2022	153.4	2	2.2
	2023	154.2	1	2.4

The next step is to properly disaggregate and analyse each country separately. This provides a clean starting point for interpreting further regressions. Italy shows a relatively moderate deficit, while investment and the number of public-

private partnership projects show moderate variation, with a peak in investment in 2023 and a peak in quantity in 2021. Table 3 summarizes the minimum, maximum, mean, and standard deviation for the three indicators for 2020–2023.

Table 3. Standard deviations for the main indicators in the simulation for Italy.

Indicator	Minimum	Maximum	Average	Standard deviation
Government budget deficit (EUR billions)	153.44	161.21	157.33	4.03
Public-private partnership investments (EUR billions)	1.8	2.4	2.07	0.27
Number of public-private partnership projects (units)	1	3	1.75	0.95

In France, there is a wider range of deficits and public-private partnership investments, as well as significant variations in the number of projects. This picture suggests that the French public-private partnership market is more “impulsive” from year to year, which explains the moderate but unstable relationship between deficits and investment volumes and the almost zero relationship with the number of agreements in the short term (Table 4).

Table 4. Standard deviations for the main indicators in the simulation for France.

Indicator	Minimum	Maximum	Average	Standard deviation
Government budget deficit (EUR billions)	125.8	207.1	162.9	33.7
Public-private partnership investments (EUR billions)	1.4	4.2	2.4	1.2
Number of public-private partnership projects (units)	6	21	15.2	6.4

For each country, a time series for 2020–2023 was generated: D_{it} — deficit by module (billion EUR); I_{it} — investments in public-private partnership (EUR billion); N_{it} — number of projects (pcs.). According to calculations, for Italy, the scale of the budget deficit in EUR billions $D = \{160, 161, 210; 153, 154\}$, investments in public-private partnerships $I = \{1,9; 1,8; 2,2; 2,4\}$, and the number of projects $N = \{1; 3; 2; 1\}$. Next, for the pairs (D, I) , (D, N) , (I, N) , the Pearson sample correlation was calculated. The three obtained coefficients are in a symmetric matrix (diagonals = 1). As a result, we obtain a correlation matrix.

Table 5. Correlation matrix for Italy.

Indicator	Deficit	Investments	Number of projects
Government budget deficit (EUR billions)	1	-0.924	0.335
Public-private partnership investments (EUR billions)	-0.924	1	-0.537
Number of public-private partnership projects (units)	0.335	-0.537	1

Therefore, in Italy, there is a very strong negative correlation between deficit and public-private partnership investment. In years of greater deficit, the amounts of funding are generally lower. It should be noted that the described dependence is consistent with the effect of hard budget constraints, which means that when the deficit expands, the government reduces co-financing, state guarantees, and availability payment obligations, which directly narrows the possibilities of financial resolution of agreements. The correlation between deficit and the number of projects is weak and positive. The graph shows a clear downward relationship between the scale of the public budget deficit (on the X axis) and the annual investment in public-private partnership projects (on the Y axis). Thus, an increase in the deficit is associated with a decrease in the available public-private partnership investment scale in the short term. The dispersion of the points is small, so the trend is clearly visible, without significant outliers (Figure 1).

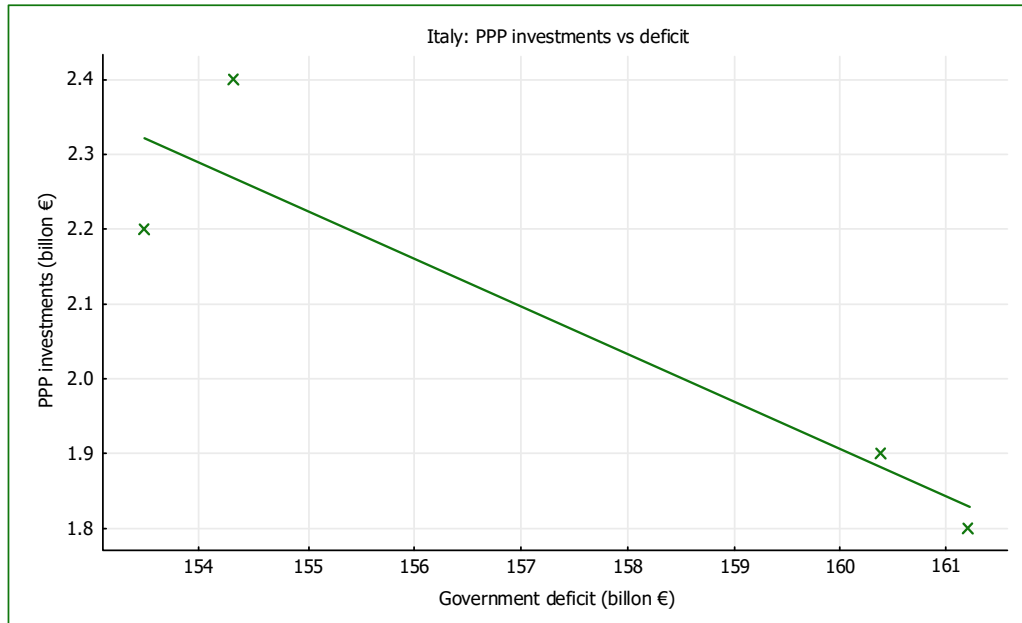


Figure 1. Relationship between budget deficit and public-private partnership investment in Italy 2020–2023.

It should be noted that the number of projects responds weakly to changes in the deficit and fluctuates in the range of one to three projects per year. The regression line is almost flat, so the number of deals reflects the characteristics of the project pipeline and the readiness of packages for closure rather than directly responding to fiscal fluctuations. Therefore, small absolute values (1–3) make the series sensitive to each year (Figure 2).

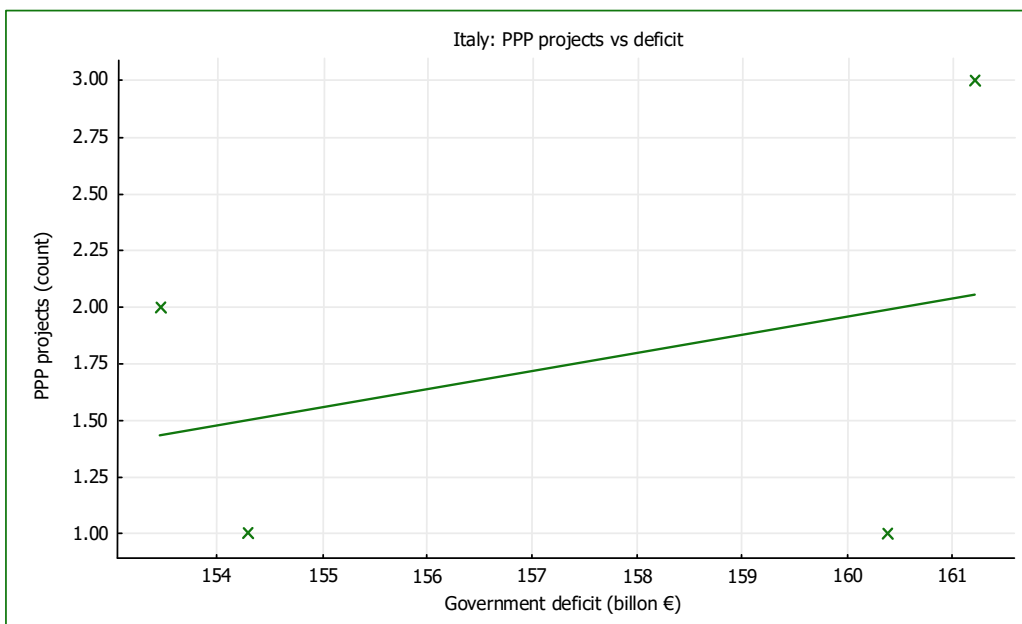


Figure 2. Correlation between the size of the budget deficit and the number of public-private partnership projects in Italy, 2020–2023.

Similarly, three series for 2020–2023 were collected for France. For each pair of variables (D, I), (D, N), (I, N), the Pearson correlation was calculated using the same sampling formula (means, deviations, products of deviations, normalization to sample standard deviations). The coefficients were then reduced to a symmetric correlation matrix with units on the diagonal and rounded to three digits (Table 5).

Table 5. Correlation matrix for France.

Indicator	Deficit	Investments	Number of projects
Government budget deficit (EUR billions)	1	-0.617	-0.075
Public-private partnership investments (EUR billions)	-0.617	1	0.473
Number of public-private partnership projects (units)	-0.0075	-0.473	1

Thus, when the deficit decreased sharply in 2022, the volume of PPP investments jumped to a peak (around EUR 4.2 billion), and when the deficit increased again in 2023, investments decreased to around EUR 2.1 billion. At the same time, 2020–2021 show that even with large deficits, volumes can remain moderate (EUR 2.2 billion and EUR 1.4 billion), so the result is also influenced by non-fiscal factors. The regression line is negative, but the data have a larger amplitude than in Italy (Figure 3).

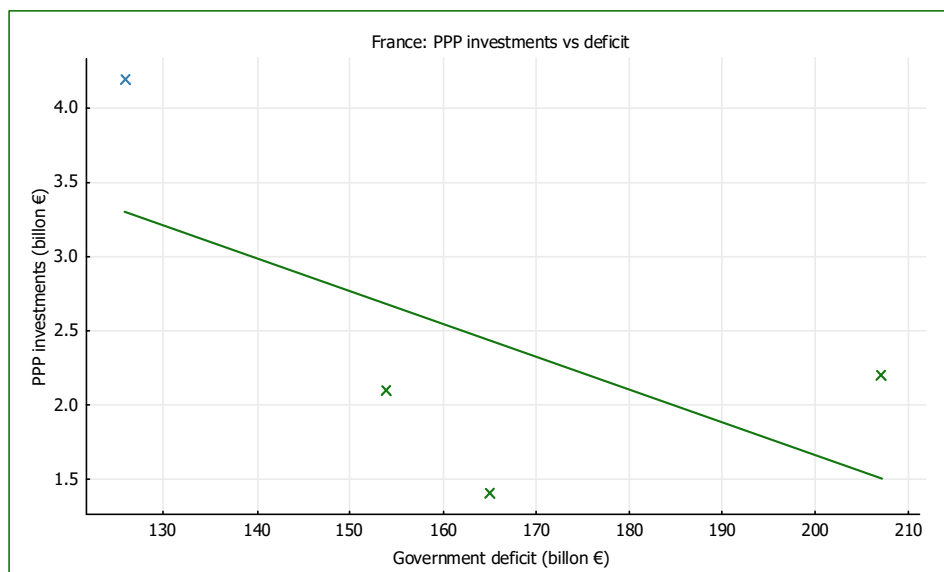


Figure 3. The relationship between the budget deficit and investment in public-private partnerships in France, 2020-2023.

The relationship between the deficit and the number of public-private partnership projects is also not stable here. The trend line is almost horizontal, which indicates a weak systemic connection. In 2021, with a higher deficit, 17 were closed, in 2022, with a lower deficit, 21, and in 2023, with a growing deficit, 6 (Figure 4).

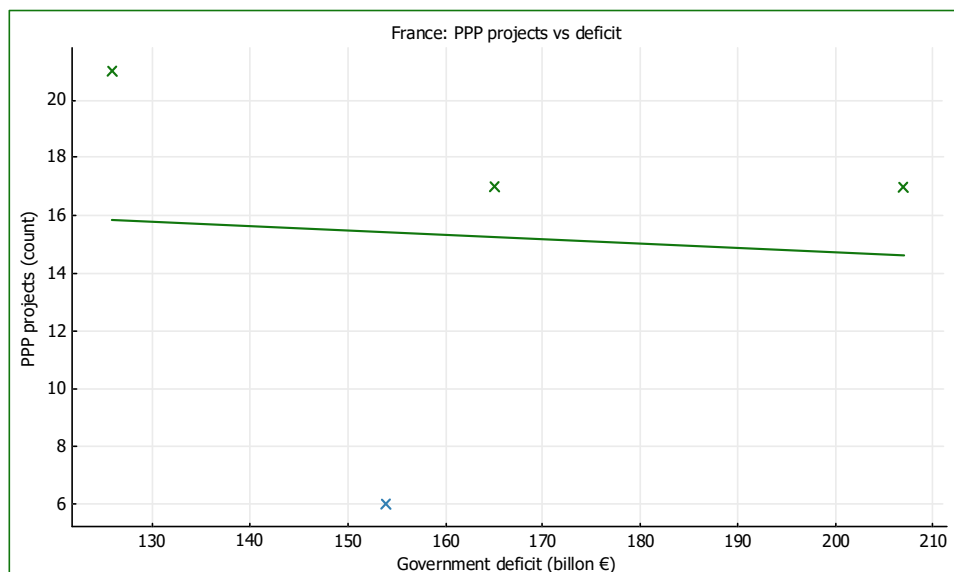


Figure 4. Correlation between the scale of the budget deficit and the number of public-private partnership projects in France for 2020-2023.

We estimate six linear models using the least squares method with standard Huber–White robust errors. We construct a regression for each country separately. In this case, the dependent variables are investments in public-private partnerships or the number of projects. This estimate will reflect only the magnitude of the deficit in billions of euros. The sign of the coefficient on the deficit for investments is negative in all specifications. That is, a larger deficit is associated with smaller amounts of financial closure. For Italy, the estimate is strong and statistically convincing in our short series. For France, the sign is the same, but the statistical significance is weak. For this number of projects, the effect is insignificant (Table 7).

Table 7. Regression results.

Country	Model	Coefficient at deficiency	Standard error (HC1)	p-value	R ²
Italy	investment ~ deficit	-0.0631	0.0183	0.0006	0.8538
	number of projects ~ deficit	0.0795	0.158	0.6148	0.512
France	investment ~ deficit	-0.022	0.019	0.2476	0.3802
	number of projects ~ deficit	-0.0143	0.0979	0.8838	0.56

The interpretation of the propensities (increase of EUR 10 billion in deficit) should be presented next. For investment models, this means by how many billions of euros on average the annual financial closure of public-private partnership projects changes with an increase in the deficit by ten billion euros, and for quantity models, by how many units the number of projects changes. Negative values indicate expected decreases, positive values indicate expected increases. For example, in Italy, an additional ten billion euros of deficit corresponds to a decrease in public-private partnership investments by about six hundred and thirty-one thousand billion euros, while for France, the effect is smaller in magnitude (Table 8).

Table 8. Interpretation of slopes (EUR 10 billion increase to deficit).

Specification	Expected change in outcome with a deficit increase of EUR 10 billion
Italy: Public-Private Partnership Investments	EUR -0.631 billion
France: Public-Private Partnership Investments	EUR -0.220 billion
Italy: Number of Public-Private Partnership Projects	+0.795
France: Number of Public-Private Partnership Projects	-0.143

Given the results, in France it is worth focusing on smoothing the “waves” of project closures. In Italy, where the number of deals is small but investment amounts are growing, the priority should be to build the capacity of customers, standardize and prepare a pipeline of quality projects, as well as create a stable multi-year framework for payment availability and transparent accounting of contingent liabilities to scale investment potential without losing risk manageability (Figure 5).

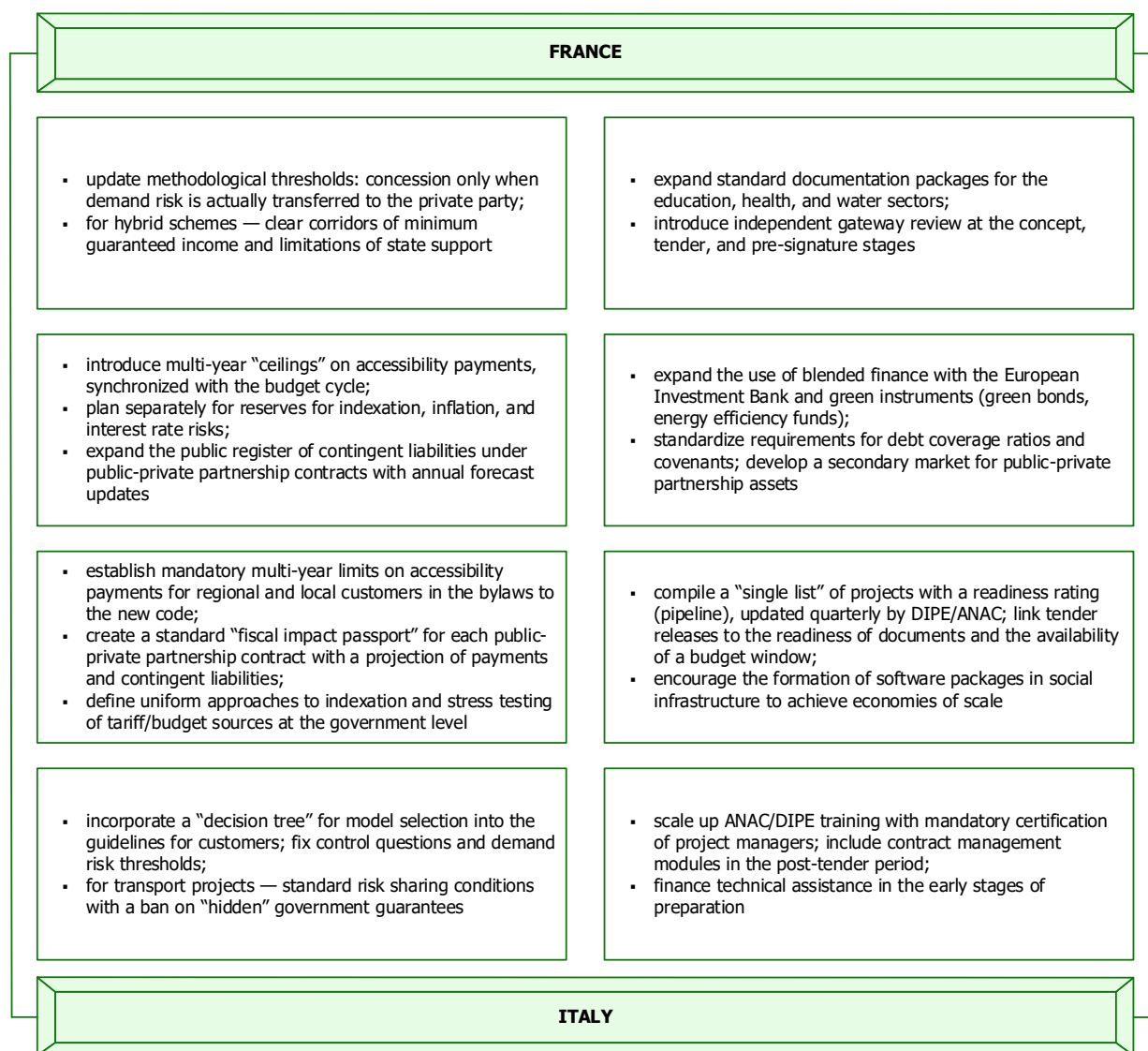


Figure 5. Key areas for improvement based on modeling results for both countries.

To sum up, it can be stated that for 2020–2023, the scale of the budget deficit in France and Italy has a stable negative relationship with the investment volume of public-private partnerships, while the number of projects reacts weakly and unsystematically. It should be noted that in France, there is a “wave” dynamic with peaks when the deficit decreases, while in Italy, the configuration “fewer transactions — higher average check” is evident, which indicates the role of large individual contracts.

DISCUSSION

Empirical and conceptual approaches to public-private partnerships point to at least two key points that are relevant to assessing the impact of budget deficits on investment potential in the European Union. First, private investors’ decisions in public-private partnerships are determined by their perception of the risk of the public partner, the risk-sharing structure, and the predictability of fiscal obligations. Even small signals of rising sovereign risk are translated into higher risk premiums, tighter debt financing conditions, and more careful project screening (Demirag, Khadaroo, Stapleton, & Stevenson, 2010). Secondly, the contemporary discourse goes beyond off-balance sheet logic and interprets public-private partnerships as a tool for achieving sustainable development goals, where the investment decision must be consistent with environmental, social, and governance criteria at all stages of the life cycle (Cheng, Wang, Xiong, Zhu, & Cheng, 2021). We believe that in a budget deficit, these two dimensions converge. Consequently, the higher the confidence in fiscal discipline and contract design, the greater the likelihood of attracting private capital to those projects that generate long-term value for money, taking into account the goals of sustainability.

A study of the financial aspect of the public-private partnership market demonstrates the presence of institutional heterogeneity, which only increases the sensitivity of investment potential to budget constraints. The experience of a country like Poland shows that sources of financing (bank loans, bonds, funds, or even funding from European organizations) have different natures and risk tendencies, while the structure of agreements is subject to constant development and complexity in accordance with regulatory changes and the state of public finances (Osinski, 2022). It should also be noted that during the period of increasing deficit, the demand for instruments of reduced volatility of cash flows (payments for availability, minimum incomes, indexation provisions) grows in parallel. At the same time, it is the quality of these instruments that will determine whether they will turn into hidden fiscal risks for the state. If we consider the main sources of project uncertainty within the public-private partnership, their formation is laid down at the stage of initial formation. In particular, we are talking about the direct decision on participation, the configuration of partners, preliminary distribution of risks, and other processes that form the basis for stability to dynamics and shocks in the future (Keers & van Fenema, 2018). In this context, it can be argued that the use of proactive contracting, including early agreement on the entire algorithm for adaptation to changes, indicators of the need to revise conditions and a clear delineation of areas of responsibility, will significantly reduce most transaction costs for crisis revisions, which is especially relevant in conditions of budget deficit (Tieva & Junnonen, 2009). Taking into account the above opinions of the authors, it is the "institutionalized flexibility" of the contract within the framework of public-private partnership that can become a buffer in overcoming the negative consequences of fiscal fluctuations and will ensure the ability of the project to provide the potential for security of cash flows.

Classic success factors of public-private partnerships are transparent selection criteria, balanced risk distribution, life-cycle thinking, competition for the best solution, and effective management. This makes it possible to maintain validity even in conditions of deficit, taking into account that their "weight" in the overall performance model increases (Zhang, 2005). It is worth noting that under fiscal strain, it is contractual discipline and the incentives of the parties to fulfill their obligations that determine whether private capital will be willing to accept longer payback horizons and more complex risk profiles. This is consistent with the findings on the role of the public sector as a "carrier of permanence", meaning that the state's ability to maintain asset management standards, ensure timely payments, and moderate external risks is directly correlated with the sustainability of public-private partnerships (Ma, Zeng, Lin, & Zeng, 2020).

Public-private partnerships in urban development are particularly dependent on the level of investment potential. Consequently, territorial development projects are often subject to regulatory, market, and social risks and therefore require precise alignment of interests and a high level of transparency among participants. (Jakaitis, Paliulis, & Meidutė, 2011). The integration of the concept of permanence into the structure of public-private partnerships means that deficit budgets may not reduce investment potential in the long term. For this purpose, an effective system of eliminating projects with low-quality project structure or imperfect mechanisms of social legitimization is formed (Cheng et al., 2021). We believe that urban infrastructure projects can quickly respond to changes in the cost of capital, which is an indicator of private investors' confidence in fiscal sustainability and regulatory predictability. The most relevant financial studies confirm the hypothesis of heterogeneity in risk perception and the associated differentiation in the cost of capital. Consequently, investors tend to clearly distinguish between political, macroeconomic, legal, and project risks. Their perception and compensation for risk are extremely sensitive to the quality of information, the history of fulfilling obligations, and the presence or absence of conflicts between agents (Demirag et al., 2010). It should also be noted that this heterogeneity significantly increases the cyclicity of the market. Given this, in times of fiscal stress, capital moves to jurisdictions and sectors that have the best risk-contracting ratio in their structure, ensuring the existence of a wide window of opportunity for the adoption of more complex and innovative agreements.

Systematization of the above allows us to explain why the simple assumption that "deficit increases the role of public-private partnership" is incomplete. Thus, deficit increases the demand for extra-budgetary investments, but investment potential materializes only under the following conditions: proactive contracting and flexibility of transactions, high-quality institutional capacity of the public partner to maintain consistency, a diversified financing ecosystem, and the consistency of projects with security criteria.

CONCLUSIONS

Finally, we note that a negative marginal effect was recorded specifically for investments. An increase in the deficit by one billion euros is associated with a smaller amount of financial closure in the corresponding year. For Italy, this relationship is more expressive and statistically confident in the short sample, while for France, it is weaker and statistically more fragile, but with the same sign. Interpretatively, this is consistent with the logic that a wider deficit increases perceived fiscal risks and the cost of capital, and reduces the ability of the public side to assume long-term payment obligations

necessary for large-scale public-private partnership contracts. No stable effect was found for the number of projects. The results were close to zero or statistically insignificant. This means that the decision to launch and bring a certain number of transactions to financial closure is determined to a greater extent by institutional factors of preparation, the industry portfolio, and the manageability of processes by the state than by the current size of the deficit. In other words, the deficit affects the scale of investments, but does not always determine the number of transactions closed in a given year.

Further research should focus on economic sectors (transport, social infrastructure, energy), where sensitivity to the fiscal background may differ significantly. It is necessary to check the robustness of the results to alternative metrics of fiscal pressure (e.g., debt servicing indicators, government bond yields as an approximation to the cost of capital), use tests for structural breaks (in particular for pandemic years), and compare approaches to structured guarantees and budgetary reflection of obligations under government contracts and short-term fluctuations in the deficit.

ADDITIONAL INFORMATION

AUTHOR CONTRIBUTIONS

All authors have contributed equally.

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CONFLICT OF INTEREST

The Authors declare that there is no conflict of interest.

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Сергієнко Л., Бондарчук Н., Белінська С., Тополенко Н., Дзюба Р.

ОЦІНЮВАННЯ ВПЛИВУ БЮДЖЕТНОГО ДЕФІЦИТУ НА ІНВЕСТИЦІЙНИЙ ПОТЕНЦІАЛ ДЕРЖАВНО-ПРИВАТНОГО ПАРТНЕРСТВА В КРАЇНАХ ЄС

Дослідження спрямоване на виявлення того, чи пов'язаний масштаб бюджетного дефіциту з інвестиційним потенціалом державно-приватного партнерства у Франції та Італії протягом 2020–2023 років. Інвестиційний потенціал вимірювали двома показниками: річним обсягом інвестицій у проекти державно-приватного партнерства (мільярди євро) та кількістю проектів, що досягли фінансового закриття. Як ключову пояснювальну змінну використано величину дефіциту державних фінансів за модулем у мільярдах євро, що забезпечує стабільну інтерпретацію «більший дефіцит означає більшу кількість мільярдів нестачі ресурсів». Методично застосовано лінійну регресію з фіксованими ефектами країн, яка дає змогу відокремити стале інституційне тло від внутрішньорічних коливань та оцінити граничний вплив додаткового одного мільярда євро дефіциту на показники державно-приватного партнерства. Для підвищення надійності використано робастні стандартні похибки за підходом Губера–Вайта, а також проведено дублюючі оцінювання окремо для кожної країни. Описові статистики й кореляційний аналіз використано як індикативне доповнення до причинно-наслідкової інтерпретації регресійних коефіцієнтів. Результати свідчать, що для обсягу інвестицій у проекти державно-приватного партнерства спостерігається від'ємний нахил щодо масштабу дефіциту. Водночас для кількості проектів стабільного та статистично переконливого ефекту не виявлено: вплив дефіциту на рахунок угод є близьким до нульового або несуттєвим. Практична інтерпретація підкреслює необхідність обмеження дефіциту або принаймні захисту довгострокових зобов'язань у межах державно-приватного партнерства від короткострокового фіскального тиску, якщо мета політики полягає в збільшенні саме інвестиційного масштабу державно-приватного партнерства.

Ключові слова: бюджетний дефіцит, інвестиційний потенціал, державно-приватне партнерство, інвестиції, кількість проектів, фіксовані ефекти, регресійний аналіз, фіскальна політика, країни ЄС

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