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PUBLIC AND PRIVATE SECTOR PARTICIPATION IN IRAN'S HEALTHCARE PROJECTS: EXAMINING, PRIORITIZING, AND EXPLAINING THE CRITIC MODEL

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Abstract

infrastructural challenges posed by rapid urbanization, with a particular focus on the healthcare sector. Urban expansion has introduced complex demands that traditional government-led financing mechanisms—such as tax-based funding—can no longer fully support. Modern infrastructure development, ranging from intra-city and inter-city roads to information technology systems, must be inclusive and stakeholder-centred to be effective. Historically, infrastructure projects have been predominantly managed by the public sector due to their high costs, long investment return periods, and regulatory constraints discouraging private participation. However, the increasing inefficiencies of public-only approaches have underscored the need for private sector involvement. Leveraging the private sector's technical expertise, financial strength, and project management capabilities has become essential for timely and efficient infrastructure delivery. This research draws insights from international experiences, particularly from countries like Turkey, to highlight how collaborative PPP frameworks can bridge infrastructure gaps. The findings offer practical implications for policymakers seeking sustainable and efficient urban development strategies. Implementing well-structured partnerships can help cities meet contemporary infrastructure needs while promoting economic resilience and social well-being.

Keywords: Partnership Methods, Healthcare Projects, Public, Private.

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1. Introduction

The concept of Public-Private Partnership (PPP) originated in the United States as a mechanism for joint financing between the public and private sectors. Its widespread implementation began in the 1960s, particularly in urban renewal initiatives that leveraged combined investments from both parties. In the context of international development, PPPs have evolved into structured collaborations involving governments, donor agencies, and private enterprises—especially in the fields of healthcare and broader economic infrastructure. Under typical PPP arrangements, the private sector assumes responsibility for the design, financing, construction, operation, and maintenance of public infrastructure, with remuneration provided by the public sector or end-users throughout the contract period. Ownership of the asset either remains with the public sector or is transferred to it upon the contract's conclusion. PPP represents a long-term contractual framework for delivering public services through cooperative arrangements between government entities and private actors. Such partnerships become imperative when neither sector can independently undertake large-scale, long-duration projects due to constraints in capital, time, or technical expertise. These contracts can range from short-term service agreements to highly complex, multi-decade infrastructure undertakings. PPPs may encompass physical construction, ongoing maintenance, or financial provisioning, serving as a sustainable mechanism for addressing urban infrastructure deficits and supporting comprehensive urban development plans. By engaging private-sector capabilities, PPPs have the potential to elevate the quality and efficiency of public service delivery.

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Among the most frequently cited advantages of PPPs are enhanced efficiency, innovation, access to advanced technologies, financial leverage, and performance-based accountability. These collaborations often yield value through the private sector's agility, specialized skills, and willingness to share both risk and reward [1][2]. Nevertheless, the multifaceted nature of PPPs can hinder the alignment of stakeholder objectives, particularly due to their long-term horizons and the necessity for projects to remain financially viable for private participants. The sensitivity of such contracts to political, economic, legal, and institutional factors—alongside complex financing structures and technical uncertainties—demands rigorous planning and negotiation during the concession and feasibility phases. Despite an expanding body of research on PPP frameworks, limited attention has been paid to the systematic identification and prioritization of criteria for selecting the most appropriate contract model for civil infrastructure development. Unlike conventional procurement mechanisms, PPP arrangements involve inherently divergent stakeholder goals, rendering the identification of effective evaluation criteria considerably more complex. Establishing a clear framework for these criteria is therefore essential to ensuring optimal contract selection and successful project implementation [3].

2. Literature review

In Iran, Farshad Hibati and Mousa Ahmadi, in their 2009 doctoral dissertation, investigated this topic using panel data from 21 countries. Their research indicated that national income, economic stability, budget deficit, and the export of underground resources, such as fuel, are among the significant factors influencing the extent to which developing countries utilize public-private partnerships (PPP). Mona Hamami and colleagues, using panel data, also studied the topic in 2006. Their findings suggest that PPPs are more prevalent in countries facing heavy debt and have large market demand and size. Economic stability, the existing regulatory framework for such projects, and previous experience with these projects are critical factors in this context [1]. large-scale infrastructure projects globally, concerns remain regarding their success—particularly in terms of economic and environmental outcomes. This issue has been especially prominent in Turkey, where PPP projects have faced intense scrutiny for their impact and effectiveness. Addressing these concerns requires a clear identification of success criteria and their relative importance, enabling project stakeholders to align objectives and streamline implementation processes accordingly.

In this context, [4] conducted an empirical study to determine the most relevant success criteria for Turkish PPP projects, taking into account the country's unique economic, cultural, and institutional characteristics. The study emphasized that success criteria are not universal and may significantly vary depending on the national context and the stakeholders involved. Accordingly, a set of 15 success criteria was initially derived from global literature. A structured questionnaire was then distributed to 33 PPP experts in Turkey, and the responses were analyzed using factor analysis. The analysis identified four core dimensions, with project delivery performance and contribution to public welfare emerging as the most significant. Moreover, the study employed the Mann-Whitney U test to explore differences between public and private sector perspectives. The results revealed substantial disagreement between the two groups regarding three specific criteria: compliance with output specifications, provision of reliable public services, and reduction in public administrative costs. These findings underscore the importance of stakeholder-specific evaluation mechanisms and the need to bridge perception gaps to improve PPP project outcomes. This study contributes to the growing body of knowledge by demonstrating that both the context of implementation and the alignment of stakeholder priorities are vital for PPP project success, especially in countries with emerging economies and complex governance landscapes [4]. countries between 1997 and 2019, examining technologies such as solar, hydro, wind, and biomass. The findings underscored that projects with governance structures assigning greater responsibility to private partners attracted more private capital. Risk transfer to the private sector was shown to play a pivotal role, interacting with both project-level and institutional factors. This interaction revealed complementary and substitution effects that influence investment behavior, providing practical guidance for policymakers and project managers aiming to optimize risk-sharing frameworks and enhance the sustainability of PPP projects. In another global investigation, [6] conducted a comprehensive literature review and expert survey involving 60 professionals with experience in renewable energy PPPs across multiple regions. This study revealed that political and regulatory

uncertainties are the predominant barriers to successful implementation, while well-structured contracts and capable stakeholders are among the key success factors (KSFs). Notably, these risks and success factors varied geographically, and significant perception gaps were identified between public and private sector actors, particularly regarding risk severity and the prioritization of KSFs. Focusing on a national context, [7] explored the PPP landscape in Saudi Arabia within the framework of Vision 2030. This quantitative study utilized structural equation modeling (SEM) with a sample of 543 respondents to identify critical success factors in Saudi infrastructure PPPs. Results highlighted the importance of procurement transparency, effective risk allocation, and knowledge management. Importantly, the study found that the impact of governance and communication practices differs between strategic decision-makers and operational managers. Two frameworks were proposed to guide stakeholders at various organizational levels, emphasizing that contextual governance dynamics and stakeholder communication must be tailored for PPP success.

Norzaei[8] examined the optimal selection of public-private partnerships in projects of the Ministry of Roads and Urban Development. Albalate and colleagues, in a study on determining factors for contract type selection and private sector participation in U.S. infrastructure projects, after describing various partnership contracts and their pros and cons using discrete econometric models (logit and probit) and data from 1985 to 2008, concluded that large private sector partnerships occur in independent operational projects. Governments under high debt pressure are more inclined to attract private investment, while high tax burdens and revenues from taxes reduce private sector participation [9]. Besada, in an article on investment in developing countries, concluded that private investment is significantly influenced by expropriation risk, degree of civil liberties, and bureaucracy. Economic growth is also affected by expropriation risk and long-term contract noncompliance. He also noted that the risk of civil wars, bureaucratic processes, and government disregard for contracts play crucial roles in investment performance and economic growth [10]. For the first time globally, Turgut Ozal, the Prime Minister of Turkey in the 1980s, used BOT contracts for developing energy infrastructure, particularly the electricity industry. In recent years, significant effort has been made to identify the challenges faced by these contracts. For instance, [11],[12], and [13] examined the challenges of PPP projects. Extensive efforts have been made to identify and structure factors that influence PPP contracts. For example, in 2005, Li et al. examined the critical success factors (CSFs) of PPP projects in the UK. In 2010, Chen and colleagues, by developing Li's questionnaire, conducted similar research in China and identified 18 influential factors, comparing their results with Li's findings. Ng et al. [14] studied the factors that affect the feasibility of PPP projects. They identified many factors through extensive literature review and categorized them into five main groups: technical, financial and economic, political and social, and other factors. They also examined the criteria for stakeholder satisfaction in PPP projects and found a relationship between only six of the identified criteria and stakeholder satisfaction. Zerahoun and colleagues [15] identified 17 important performance criteria for joint venture projects. Ayr and Sagir [16] examined the challenges of PPP contracts in road construction projects. The identification of success criteria and the final performance evaluation of partnership contracts has recently gained attention from researchers such as Jeffries [17]. In 2012, Yuan et al. presented a structured model for evaluating the performance of PPP projects. PPPs are an alternative and efficient method for financing infrastructure elements such as wastewater treatment and water facilities. The long-term nature and dynamic uncertainty of these contracts leads to inevitable and productive renegotiations. However, renegotiation is recognized as the Achilles heel of concessions. Renegotiations initiated by the concessionaire during construction usually occur when actual construction costs exceed forecasts. To examine when the concessionaire initiates renegotiation and the dynamic evolution of their renegotiation behavior when actual construction costs in a wastewater treatment PPP project significantly increase, this study introduces construction cost fluctuation as a quantitative indicator and creates an evolutionary game model for analysis. The non-renegotiation and renegotiation thresholds of the concessionaire can be depicted based on this model. Given these two thresholds, the range of construction cost fluctuations can be divided into three intervals. This study further examines the evolution of the concessionaire's renegotiation behaviour when construction cost fluctuations fall within these three intervals. The findings indicate that when actual construction costs in wastewater treatment PPPs are significantly exceeded, the concessionaire's best strategic choice in the cooperation dilemma is related to construction cost

fluctuations. The results showed nonlinear relationships between renegotiation behaviour and construction cost fluctuations, providing a reference for adjusting PPP renegotiation behaviour during the construction phase to reduce its occurrence [18]. The influencing factors must be comprehensively and accurately identified to systematically adjust for and coordinate conflicts of interest. Based on the theoretical and practical research in Zhang's 2022 paper [19], 52 factors influencing conflicts of interest in smart city PPP construction projects were initially screened. Subsequently, through expert interviews and questionnaire analysis to adjust and revise the index system, 27 related index systems were formed. To further identify key influencing factors and clarify their importance, the gray distance number (DEMATEL) method was used to identify key factors causing conflicts of interest in smart-city PPP construction projects to enhance identification effectiveness. Research shows that project complexity, the comprehensive quality of project personnel, and differences in ideological and cultural concepts have become the main influencing factors. Social project benefits, project quality compliance rates, project profit rates, and return rates are the most important outcome factors. Government behaviour has an initial impact on conflicts of interest in smart city PPP construction. Additionally, conflicts of interest are closely related to other project stakeholders, particularly the private sector, social capital, and public behaviour. Therefore, to implement a flexible incentive and constraint mechanism, government decision-making behaviour and the mechanism of incentives and constraints should first examine stakeholders' interests and behavioural strategies, especially the trend of behavioural changes under the government's incentive and constraint mechanism.

3. Public-Private Partnership in Healthcare Projects in Turkey

Turkey's healthcare sector has experienced substantial structural reform in recent decades, marked most notably by the implementation of the Health Transformation Program launched by the Ministry of Health (MoH) in 2003. A cornerstone of this reform agenda has been the extensive use of Public-Private Partnership (PPP) models for the construction and modernization of integrated healthcare facilities. Beginning in 2009, the MoH initiated tendering and contractual negotiations for 18 major PPP-based healthcare projects, collectively representing an estimated investment of approximately USD 5 billion. These projects are currently at varying stages of development, ranging from company pre-qualification to financial closure.The pioneering initiative under this program was the Kayseri Integrated Health Campus, which commenced in 2011 and is widely regarded as a flagship PPP healthcare project in Turkey. Known as the Kayseri City Hospital, the project was delivered through a partnership between the Turkish government and a private consortium. It comprises several specialized facilities, including a 412-bed cardiology hospital, a 277-bed paediatric hospital, a 120-bed psychiatric facility, a 100-bed forensic medical unit, an 18-bed burn treatment clinic, and a 480-bed general hospital. The private partner contributed €418 million in capital investment, with the financial model structured to recoup the initial outlay along with profit over a 25-year concession period. The use of the PPP model in Turkey's health care sector offers several advantages.

• Increased Government Investment Capability: The PPP approach has enabled governments to invest in other construction projects within the industry.

• Reduced Construction Time: Traditional methods require 8 to 10 years to build healthcare centers, whereas the PPP model has reduced this time to two to three years.

• Enhanced Healthcare Services: The rapid construction process facilitates faster and higher-quality healthcare service delivery.

4. Methodology

This study will employ a mixed-methods approach to data collection, combining qualitative and quantitative techniques. The first component involves a comprehensive literature review, drawing on diverse sources including official websites, scholarly books, peer-reviewed journals (in both Persian and English), project documentation, newspapers, periodicals, and consultations with subject-matter experts. Semi-structured interviews will also be conducted with experienced professionals, project managers, and sectoral experts to enrich the researcher's understanding and contextual insight. These interviews will be conducted in an open-ended format to ensure depth and flexibility in responses, allowing for the exploration of nuanced perspectives. The primary instrument for quantitative data

collection will be a structured questionnaire. Designed based on empirical experiences and established success factors in civil infrastructure projects—particularly within the healthcare sector—the questionnaire aims to elicit insights into factors influencing project success. The findings will subsequently be analysed using the CRITIC (Criteria Importance Through Intercriteria Correlation) method. Originally proposed by Diakoulaki, Mavrotas, and Papayannakis and formalized by Zelini in 1982, the CRITIC method [20] is a multi-criteria decision-making (MCDM) technique used to determine the objective weights of evaluation criteria. A key feature of this method, as noted by Gholami [21], is its exclusion of subjective expert judgments, thereby minimizing bias and enhancing result reliability [22]. Instead of relying on expert opinion, the CRITIC method assigns weights based on the statistical properties of the criteria—specifically the standard deviation and the correlation between criteria—allowing it to quantify the importance of each criterion in terms of both variability and conflict. The method involves constructing a decision matrix and analysing the extent of contrast and interdependence among the criteria. Greater standard deviation indicates higher variability, while lower correlation with other criteria suggests distinctiveness. Together, these parameters determine the final weight assigned to each criterion. This analytical process addresses the limitations associated with subjective weighting approaches, offering a more robust and reproducible framework for prioritization. In this context, it is assumed that each criterion's importance emerges from its inherent variability and its independence from other factors within the dataset.

1.The standard deviation of each factor indicates the degree of homogeneity or heterogeneity. Therefore, a lower standard deviation can contribute to a lower weight.

2.The greater the positive correlation between criteria, the more justifiable the changes in one criterion will be as a representative of changes in another.

The first step in this method is forming the decision matrix, which is similar to the decision matrices used in methods like Shannon entropy, TOPSIS, etc. In this method, the positive or negative nature of criteria does not affect the determination of weight.

The decision matrix comprises mmm options and nnn criteria, typically written as:

$$X = \begin{bmatrix} x_{11} & x_{12} \cdots & x_{1n} \\ x_{21} & x_{22} \cdots & x_{2n} \\ \vdots & \vdots & \vdots \\ x_{m1} & x_{m2} & x_{mn} \end{bmatrix}$$

- Step 1: The correlation of the data is measured using the following formula:

$$r_{ij} = \frac{x_{ij} - x_j^{\min}}{x_j^{\max} - x_j^{\min}}$$

- Step 2: The initial weight of the criteria is determined using:

$$C_j = \sigma_j \sum_{i=1}^{m} (1 - r_{ij})$$

- Step 3: Finally, the final weight of the criteria is determined using the linear method:

$$w_j = \frac{C_j}{\sum_{i=1}^{m} C_i}$$

Thus, with the same data from the decision matrix and considering the dispersion and correlation of the data, the weight of each criterion is calculated. Unlike the entropy method, the Critic method does not rely solely on data dispersion for decision-making. Since the final criterion weights are calculated using a linear method, the sum of the criterion weights will equal 1.

5. Funding Challenges and Utilization of Partnership Methods in Healthcare Projects in Iran

To obtain qualitative insights into the challenges associated with Public-Private Partnership (PPP) contracts, in-depth interviews were conducted with subject-matter experts possessing a minimum of ten years of professional experience in the field. A purposive sampling strategy—classified as a non-probabilistic method—was employed to construct the study's sample, allowing for the intentional selection of individuals with specialized knowledge and practical expertise. A total of 14 interviews were conducted with senior managers and technical experts actively engaged in construction projects and PPP contract implementation.

Following the completion of the interview phase, the data were analysed to extract recurring themes and identify key challenges. The expert testimonies revealed a range of structural, procedural, and contextual issues that hinder the effectiveness of PPP frameworks. These challenges are summarized as follows:

5.1. Economic sanctions and reduced public revenues

• Impact of Sanctions: Economic sanctions have severely restricted Iran's access to international financial markets and reduced the country's overall revenue. This has led to significant cuts in funding for civil projects, including healthcare infrastructure.

• Decreased Public Revenue: The reduction in national income due to sanctions and other economic pressures has limited the government's ability to allocate sufficient funds to healthcare projects.

5.2. Currency Instability and High Inflation.

• Volatility of Exchange Rates: The instability and sharp increases in exchange rates create uncertainty and make it difficult to plan and budget long-term projects. This volatility increases the costs of imported medical equipment and construction materials.

• High Inflation: Persistent high inflation rates exacerbate the costs of healthcare projects, making it more challenging to secure and manage funds effectively.

5.3. Lack of government foreign currency allocation

• Shortage of Foreign Currency: The government's inability to provide foreign currency for purchasing medical equipment hampers the procurement of essential healthcare technology and supplies.

• Dependence on Imports: Many medical equipment and technologies need to be imported, requiring stable access to foreign currencies, which is currently lacking.

5.4. Absence of Sustainable Budget Lines for Healthcare Services.

• Budget Deficit: The government's budget deficit leads to the absence of sustainable budget lines for the procurement of healthcare services. This results in inconsistent and unreliable funding for ongoing and future health care projects.

6. Challenges of Using the PPP Method

6.1. Lack of Trust in the Private Sector and Numerous Obstacles to Using Private Capital.

• Trust Issues: There is a pervasive lack of trust in the private sector's ability to deliver large-scale healthcare projects. This scepticism creates significant barriers to attracting private investments.

Numerous regulatory and procedural hurdles impede the effective use of private capital in public-private partnership (PPP) projects.

6.2. Lack of Cooperation from Government Agencies.

• Execution Challenges: Government agencies often do not fully cooperate with PPP initiatives, leading to delays and inefficiencies in project implementation.

• Bureaucratic Resistance: Resistance from bureaucratic systems further complicates the execution of PPP projects, as public officials may be reluctant to engage with private partners.

6.3. Mismatch Between Investment Return Period and Loan Repayment Schedules

• Financial Misalignment: The period of return on investment in healthcare projects often does not align with the repayment schedules of bank loans. This misalignment creates financial stress and dissuades private-sector participation.

• Long Payback Periods: Healthcare projects typically have long payback periods that are not conducive to financial institutions' short-term repayment expectations.

6.4. Regulated Pricing in the health care sector

• Price Controls: Government-imposed pricing controls in the healthcare sector limit the revenue potential of private investors. These controls make it difficult to achieve desired profit margins, thereby reducing the attractiveness of PPP projects.

• Revenue Constraints: The inability to set prices freely restricts the financial viability of projects, making it challenging to secure private investments.

7. Advantages of the PPP Method

7.1. Increased Efficiency in Resource Allocation in the Health Sector

• Optimal Use of Resources: PPPs allow for better allocation and utilization of resources by leveraging the strengths and expertise of the private sector. This leads to more efficient and effective delivery of healthcare services.

• Targeted Investments: With PPPs, investments can be more strategically directed towards areas of greatest need, ensuring that healthcare resources are used where they will have the most impact.

7.2. Reduction in Administrative and Organizational Expansion

• Streamlined Processes: By involving the private sector, PPPs can streamline administrative processes and reduce bureaucratic overheads. This can lead to faster decision-making and implementation of healthcare projects.

• Cost Savings: Reducing the need for extensive government bureaucracy can result in significant cost savings, which can be reinvested in healthcare services.

7.3. Increased Productivity:

• Enhanced Performance: The private sector often brings innovative practices, advanced technologies, and efficient management techniques for PPP projects, which can significantly boost productivity.

• Performance Incentives: Private partners typically have performance-based incentives that drive them to complete projects on time and within budget, further enhancing overall productivity.

7.4. Reduction in Government Involvement

• Focus on Governance: By reducing the government's direct involvement in the management and operation of healthcare facilities, PPPs allow the government to focus more on regulatory and oversight functions.

• Encouraging Private Sector Participation: Reducing government control can encourage more private sector participation and investment in healthcare, leading to a dynamic and competitive environment.

8. Public-Private Partnership Methods in Healthcare Projects in Iran

8.1. BOT Contract (Build-Operate Transfer)

Definition: In a BOT contract, the government or public sector authorizes a private company to construct a project. After construction, the company operates the project for a certain period, during which it owns and benefits from it. Upon expiration of the contract term, ownership of the project is transferred back to the government.

Example: A private firm builds a hospital, operates it for 20 years, and then hands it over to the state.

8.2. BOO Contract (Building Own Operate)

Definition: In BOO contracts, the private sector constructs a project and indefinitely retains ownership. A private entity can operate the project and earn revenue without any obligation to transfer ownership back to the government.

Example: A private company builds and owns a healthcare facility and operates without a time-bound transfer of ownership.

8.3. BLT/BRT Contracts (Build-Lease-Transfer/Build-Rent-Transfer)

Definition: Under BLT/BRT contracts, the private sector builds a project and leases it or rents it to the government or another private entity for a specified period. After the lease period, ownership of the project was transferred to the government without any additional costs.

Mechanism: If the lease is between the private builder and the government and they agree on periodic lease payments with eventual ownership transfer, it resembles a lease-to-own arrangement.

8.4. BLOT Contract (Build-Lease-Operate-Transfer).

Definition: In BLOT contracts, the private partner is responsible for designing, financing, and constructing infrastructure projects on leased land in the public sector. The private partner operates the project for a specified period until the lease expires, after which the assets return to the public sector.

For Example: A private company builds a healthcare facility on leased government land, operates it for 15 years, and then transfers its ownership to the public sector.

8.5. Initial Public Offering (IPO) of Healthcare Project Shares

Definition: An IPO refers to the first-time offering of a company's shares to the public in the stock market. A specific percentage of a company's total shares is offered for public trading.

o Mechanism: A hospital or healthcare facility performing well can obtain the necessary approvals and list its shares on the stock market. This converts the entity from privately held to publicly held companies, allowing public investors to buy shares and, thus, raise the required capital for construction and equipment.

Example: A hospital issues an IPO, enabling public investment and securing funds for expansion and modernization.

8.6. O&M contracts (Operation and Maintenance)

Definition: In O&M contracts, the private partner operates and maintains a public sector project for a defined period under the contract terms. After the contract period, the project returned to the public sector.

Example: A private firm manages the operations and maintenance of a public hospital for ten years before returning control to the government

Table 1: Critic Matrix

Method	BLOT	BOO	BRT	IPO	O&M	BOT
BLOT	1.000	4.663	3.737	3.323	1.380	0.245
BOO	0.214	1.000	3.005	5.156	1.125	0.241
BRT	0.268	0.333	1.000	5.165	1.552	0.241
IPO	0.301	0.194	0.194	1.000	2.954	1.226
O&M	0.725	0.889	0.644	0.339	1.000	1.125
BOT	4.076	4.144	4.147	0.816	0.889	1.000

Table 2: Method Ranking

Rank	Method	Weight
1	IPO	0.22
2	BOT	0.21
3	O&M	0.17
4	BOO	0.14
5	BRT	0.14
6	BLOT	0.12

9. Conclusion

In the contemporary era of global development, one of the most pressing challenges for governments and urban planners is the delivery of urban and civil infrastructure projects through inclusive, stakeholder-oriented approaches. These projects range from intra- and inter-city transportation systems to digital infrastructure and beyond. It is widely recognized that no national economy can achieve sustained growth or long-term prosperity without a solid foundation of essential infrastructure. Traditionally, the public sector—comprising national and local governments and associated institutions—has borne the responsibility for infrastructure development. This is largely attributable to the high capital requirements, prolonged investment return horizons, limited financial depth, and the lack of adequate legal and regulatory frameworks to support private investment. However, it has become increasingly evident that the public sector, acting alone, lacks the capacity to implement and manage complex infrastructure projects efficiently and effectively. In contrast, the private sector often possesses more specialized technical expertise and superior capabilities in resource allocation and time management. Accordingly, the optimal approach to infrastructure delivery lies in the collaborative utilization of the capabilities and resources of both sectors. This includes drawing upon the technical expertise of the private sector, the regulatory and institutional support of the public sector, and—crucially—co-investment from both parties. It is for this reason that the Public-Private Partnership (PPP) model has emerged as a central framework for infrastructure development, to the extent that many leading academic and financial institutions now offer specialized education and training programs focused on PPP planning and implementation.

9.1. Key Success Factors for PPP Implementation

To support the objectives of this study, and based on the preceding considerations, four critical success factors are identified for the effective implementation of PPP projects:

- Ensuring open market access and fostering fair, non-discriminatory competition within the economic environment.
- Safeguarding the interests of diverse social groups and maximizing the socio-economic value added by PPP projects.
- Defining the optimal scope and scale of government support to focus on essential, sustainable projects while preventing the misuse of public assets for unearned profit.
- Selecting the most appropriate PPP model based on the specific characteristics of each project.

9.2. Strategic Recommendations for Successful PPP Execution

Based on expert consultations and official policy reviews, the following strategic recommendations are proposed for increasing the success rate of PPP projects:

- Projects should be initiated only where there is a high likelihood of alignment and convergence between the interests of public and private stakeholders. Identifying appropriate partners based on project type and complexity is paramount.
- The anticipated benefits of project implementation should be clearly defined prior to execution.

- All potential influencing factors should be identified in advance, with proactive strategies devised to mitigate foreseeable risks.
- Active and sustained engagement from both public and private partners is essential throughout all project phases.
- Project objectives must be clearly articulated and mutually understood by all parties. Furthermore, the specific roles and responsibilities of each partner in delivering project outcomes must be precisely delineated.
- Project risks and challenges should be allocated equitably among stakeholders to minimize overall project vulnerability.
- A formal performance monitoring system should be established to evaluate the quality of implementation, assess deviations, and enforce corrective actions as needed.

9.3. PPP Applications in Healthcare Infrastructure

In the healthcare sector, PPPs offer a versatile framework applicable across various domains, including:

- Collaborative procurement and management of medical equipment
- Completion, equipping, and operation of unfinished hospital projects
- Operation and management of existing healthcare facilities
- Commissioning and operation of newly constructed hospitals
- Operation and long-term maintenance of recently inaugurated medical centers

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