Determinant Features to Reduce the Infrastructure Gap in Saudi Arabia under a Public–Private Partnership Scheme

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Abstract: Saudi Arabia is forecast to develop a significant number of infrastructure projects, as recorded in its strategy Saudi Vision 2030. To implement this strategy, the country intends to leverage public–private partnerships. This research has various goals. Firstly, it intends to identify the determinant features (DFs) that may facilitate the population of private–public partnership (PPP) infrastructure projects in the Kingdom of Saudi Arabia (KSA) through the opinions of PPP experts. Second, it aims to analyse these opinions through a statistical approach. The research used the following methodologies: the development of a survey amongst sectorial experts, with a total of 45 valid responses; a statistical characterisation of the responses; and an exploratory factor analysis to determine the minimum number of factors explaining the proposed objectives. The findings of the research revealed that the five most relevant factors were the availability and effectiveness of a proper regulatory and legal framework; adequate risk allocation and sharing among project stakeholders; a straightforward project brief and client outcomes; the comprehensive and business viability of project feasibility studies; and finally, the assurance that proper project value management systems are in place during different project stages. As its principal contribution, this study finds, based on the experts’ opinions, that KSA should consider the mentioned determinant factors to ensure that PPP plays the expected role in the provision of infrastructure.

Keywords: infrastructure gap; determinant features; public–private partnership; Saudi Vision 2030; Saudi Arabia

1. Introduction

In a general context, it can be said that infrastructure refers to the array of systems and services needed to run the world as we perceive it. Infrastructure investment is instrumental in economic prosperity, but only with the appropriate investment amounts. Likewise, the concept of infrastructure is evolving, adapting to the world’s needs and interactions, creating an ever-growing need for new infrastructure, and enlarging its investment requirements [1].

In 2017, the prestigious consulting firm Oliver Wyman estimated that nearly USD 2.7 trillion was invested annually in infrastructure worldwide, representing four per cent of the global GDP, but it was further assessed that USD 3.7 trillion would need to be invested annually to cope with the world’s infrastructure demand. This represents a 30 per cent investment gap [2]. However, this gap is not uniform; developing and low-income countries suffer from a wider gap than developed economies, which may become narrower or wider depending on the ambitiousness of the goals and the efficiency of the targeted infrastructure. In this way, infrastructure investments in low- and middle-income countries range from two per cent to eight per cent of the GDP per year, or between USD 640 billion and USD 2.7 trillion, representing the average annual cost of developing infrastructure in different scenarios between 2015 and 2030 [3]. The United Nations Conference on Trade

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and Development (UNCTAD) estimates that developing countries are required to invest between USD 3.3 trillion and USD 4.5 trillion annually to meet the Sustainable Development Goals (SDGs) by 2030. Such estimates mean an annual financing gap of USD 2.5 trillion [4].

Whatever the metric, the need for new public infrastructure and the maintenance of that which already exists is not sufficiently met, and this dilemma is universal. The infrastructure gap is a bottleneck to economic sectors, directly curtailing the growth potential and reflected throughout the economy and society. It also negatively impacts opportunities in health, education, and other social sectors that can be just as relevant, or even more relevant, to improvements in current welfare, poverty alleviation, and future economic growth [5]. However, the bottleneck is not just on the availability of funds but on the inability to increase the flow of funds to address infrastructure needs from sources other than public coffers.

As public funds and Multilateral Development Banks (MDBs) will not be sufficient to meet the rising demand for infrastructure, governments and development agencies are turning to the private sector as the silver bullet to procure more infrastructure faster through public–private partnership (PPP) arrangements. Authors such as Wang et al. (2019) [6] and Qiu et al. (2009) [7] showed that PPPs have become an important tool for investing in and developing public infrastructure and services [7,8]. Nonetheless, increasing private investment flows to the levels expected by these organisations has proven challenging. Despite rising PPP projects across developing countries, they are unequally distributed due to uneven capacities to build the necessary institutional reforms and establish sustained capacity building to create the right environment for the private sector. On average, private participation in infrastructure currently accounts for only 33 per cent of total investments in transport, energy, water, and sanitation in emerging development economies, which is not a significant enough boost to close the gap [9].

Many countries are adopting PPP in the Middle East, particularly in the Gulf Cooperation Council (GCC) states, comprising Bahrain, Oman, Qatar, Kuwait, Saudi Arabia, and the United Arab Emirates, which have developed specific legal frameworks in recent years. They advocate for PPP and private sector participation to leverage government resources. They aim for the private sector to support their economy-diversification plans to reduce their dependence on natural resources and transform their economies to become more knowledge-based. This shifting paradigm involves mega-million infrastructure development plans, which are extremely difficult to fund through government budgets alone. Thus, there is an upcoming political will to use private finance to accomplish these goals, as reflected in the published “Kingdom of Saudi Arabia’s Saudi Vision 2030” (2016) (SV2030), which describes PPPs as a vehicle for financing future infrastructure and services [10].

Even when these countries are in the same geographical region, face similar challenges, and have similar goals for the future of their economies, they all have different socio-political dynamics shaping their institutional structures [10]. It is essential to highlight this diversity when examining the potential for developing infrastructure PPPs within each state and the determining factors that can make this scheme successful.

Although there is a substantial body of literature about the critical success factors (CSFs) for PPP projects’ development, there is a lack of studies in middle-income countries, particularly in the emerging GCC economies, as these nations have an immature PPP market with volatile economic conditions [11].

Hence, this research aims to identify the determinant features (DFs) in implementing PPP infrastructure projects in the Kingdom of Saudi Arabia (KSA) to contribute to the SV2030 development plan. To this end, a survey was carried out in the second half of 2023 among the main stakeholder experts with PPP knowledge in the field of infrastructure promotion in KSA to provide quantitative and qualitative results regarding the identification of these DFs. As the hypothesis, it is envisaged that a reduced number of features may sufficiently fulfil the objectives of this research. Furthermore, this research carried out an exploratory factor analysis to find the minimum number of factors explaining the objectives of this research.
This work is organised into four sections in addition to the introduction. Section 2 describes the background of the PPP model and its setting in the GCC and Saudi Arabia, as well as how relevant this model is for the country under its SV2030 vision. It goes on to provide an overview of previous studies concerning the success factors of PPP projects in different developing countries to understand the methodologies and outcomes of these studies. Section 3 introduces the research methodology developed and reveals the sample characteristics based on the data. Section 4 describes the qualitative results and quantitative data analysis assessing how relevant these features are to implementing PPP investment in KSA via an exploratory factor analysis (EFA) methodology. Section 5 discusses the results of this research, and Section 6 provides the conclusions and recommendations for future research.

2. State of the Art—Literature Review

2.1. Developing Infrastructure with PPPs

Numerous studies have analysed the advantages and disadvantages of PPPs. For example, Engel et al. (2020) [12] examined when PPPs are better than conventional provisions, Bovaird (2010) [13] explored the collaborative advantages of PPPs, and Tsamboulas et al. (2013) [14] analysed why governments choose PPPs for infrastructure provision and operation. As a baseline, it could be said that the PPP phenomenon is controversial [15] and has achieved mixed results [16], involving the private sector in the financing and delivery of infrastructure with sufficient value for money and sharing and transferring risks to the party best qualified to handle it while delivering projects on time [17].

In theory, PPP infrastructure projects are attractive, but their application involves a certain complexity from its conceptualisation, which differs substantially from how standard government-funded projects are conceived. This conceptualisation and the abilities of different organisations that have implemented PPP projects in the past have created a debate about the suitability of this methodology even within the political and economic environments of Western states from where the PPP concept originated [10].

Despite these complexities and the disparity of criteria, international governmental organisations and consultancy firms advocate for developing countries to embrace policies promoting PPPs, pretending to deliver more projects with better value for money and superior levels of efficiency [15]. As PPPs became popular by creating new infrastructure and services without increasing governments’ debts, other countries started testing the waters, supported or influenced by multilateral organisations such as the World Bank and other development banks. This trend created multiple multibillion-dollar PPP programmes promising to deliver countless new infrastructure and public services worldwide [18,19]. Conversely, these programmes were often planned without weighing the diversity in legal frameworks, the capacity of their fiscal and financial systems, or the preparedness of their private sectors to participate in these contracts [18].

This multitude of programmes and projects in so many countries simultaneously produced a large number of experts in the PPP field advocating the advantages of this system to create infrastructure and public services “out of thin air”. This variety of experts exploring the implementation of PPPs in multiple countries with different environments makes for numerous attitudes about the term PPP and multiple aims for when to use it. For instance, Makarov and Plotnikov (2018) [20] argued that PPPs can be considered a financial mechanism in the creation of infrastructure, as it is a phenomenon located at the intersection of project finance, financial management, investment management, and state and corporate finance. This argument led other authors to propose that PPPs are most suited for governments lacking the financial resources to implement infrastructure projects [21].

Even though these statements may be controversial to many other scholars and practitioners, the reality is that many politicians and government officials tend to think that governments with sufficient financial resources do not need the participation of the private sector in the provision of public services and infrastructure. However, authors such as
Luis et al. (2009) [22] demonstrated that implementing PPPs, besides attracting financial resources, provides even more relevant benefits, such as the faster delivery of infrastructure and services.

2.2. PPPs in the GCC and Saudi Arabia

Because of the abundance of their natural resources, the GCC countries have traditionally had significant financial resources to spare for the provision of infrastructure. However, they have also been procuring public services and infrastructure under PPPs for quite some time, albeit with limited projects and results. Kuwait was the first among the GCC states to establish regulatory and institutional frameworks for PPPs. Yet, many elements inherent to the country’s particularities have handicapped its potential. As a result, the Kuwait Authority for Partnership Projects (Kuwait’s PPP unit), established in 2008, achieved only one financial closure for a PPP project—Az-Zour North—in December 2013 [10]. Among the elements hampering the unrolling of more projects, according to Biygautane et al. (2018) [10], are the family businesses historically supported by the government’s “restrictive policies”, curtailing competition from foreign investors; “unlawful” connections between the administration and private companies that result in uneven market competition; and the lack of the technical capacity and knowledge of the public sector in delivering infrastructure projects through PPPs.

Likewise, the United Arab Emirates (UAE) has been the biggest market for PPPs among the GCC countries during the last decade. PPPs are increasingly being used to contribute to the rapid development of UAE infrastructure projects [23]. Yet, Dulaimi et al. (2010) [24] highlighted that few projects were executed using PPPs before that time, as the concept of partnering with the private sector was still immature in the UAE. This conflict of opinion may be related to the multiplicity of legislation in the different emirates. While the Government of Dubai enacted its PPP law as early as 2015, it was not until 2017 that the UAE Cabinet issued Resolution (1/1) on the procedures manual for partnerships between federal entities and the private sector [25].

In the early 2000s, the KSA government began focusing on privatisation policies, with a particular focus on Build–Operate–Transfer (BOT) and Build–Operate–Own (BOO) mechanisms [26]. At that time, KSA put the stress on using PPPs to drive the growth of the water and waste management industry [27]. Since 2015, the KSA political leadership has backed the adoption of PPPs for social infrastructure projects, and sizeable efforts have been made to reform existing laws and establish an attractive PPP landscape to generate more projects [28]. While, to date, there have not been many large-scale PPP projects in the country, and there is not much literature on the projects that have been contracted, it is worth mentioning the five independent power projects (IPPs) in the year 2000: the Madinah Airport project in 2012, the Hajj Terminal at King Abdul-Aziz International Airport, and two pilot projects led by the Ministry of Health (MOH), one in radiology and the other in service provision, about which limited information is available [29].

Biygautane et al. (2018), Khalifa et al. (2015), and Karmout et al. (2021) [10,30,31] pointed towards governance issues, the lack of appropriate legal frameworks, bureaucracy constraints, an unprepared and incapable private sector, and specific cultural differences in the approach to public services regarding the participation of the private sector as the common root elements hindering the creation of a welcoming environment to develop PPP infrastructure projects in the GCC countries. While most of these elements are common to other developing countries with their particularities and challenges, the latter is more peculiar to the region regarding the use of private sector financial resources because their legal and financial systems differ from those of the Western world.

In the GCC countries and others where Sharia is enacted, Islamic finance must be considered in how the tender process is designed, as it may differ from how PPP transactions are traditionally proposed in the West. For instance, claiming a real right to counterbalance a loan in a PPP, which theoretically should be a no-recourse arrangement, is not typical of Islamic finance. In Islamic finance, the asset’s real rights can be retained for a brief period
and then transferred to the grantor upon payment of a royalty rent or against deferred payment. Also, the third principle of Islamic finance is the prohibition of excessive risk (gharar), which does not allow uncertainties in the transactions and does not permit unspecified clauses or payments left to events out of the parties’ control. The gharar often conflicts with the object of a PPP contract, the latter usually being a piece of work yet to be built for which economic returns are only approximately quantifiable. Similar challenges may arise when structuring the financing for PPP projects, where a mix of financing sources for Sharia-compatible PPP operations may be used. They may consist of the simultaneous use of a building (istisna’) and an operating lease (ijara) contract for constructing and managing infrastructure open to economic returns. This model was adopted for the construction and management contract of Queen Alia International Airport of Amman, where, as an additional peculiarity, the authority awarded the PPP contract directly to the lending banks instead of the grantee [32].

Aside from these cultural differences in the structure of PPP projects, implementing a PPP in KSA has proven to be challenging, and the processes and mechanisms to structure projects and tenders are still a work in progress [28]. SV2030 relies significantly on implementing large infrastructure projects through PPPs to cover the country’s infrastructure gap and accelerate its infrastructure investments. SV2030 contains a Privatisation Programme that aims to open new investment opportunities, facilitate investment, and encourage innovation and competition while removing all impediments preventing the private sector from playing a more prominent role in development. Its goal is to increase private sector contributions by encouraging local and international investments in healthcare, municipal services, housing, finance, energy, and other priority sectors [33].

To create and enable this environment, SV2030 dictates establishing a PPP that enables “regulatory rules and procedures and addresses the obstacles and legislative gaps existing in the regulatory environment in general” [33]. Its primary focus is on government procurements and clauses hindering PPP projects, such as enlarging the contracts’ duration, eliminating the use of standard-form contracts designed by the Ministry of Finance and pre-approved by the Council of Ministers, shifting risk to the private sector, allowing arbitration only with the approval of the King—an effort that is rarely undertaken—and also requiring the approval of the King to be exempt from any individual Government Tender Procurement Law provisions [34]. Also, to encourage foreign investors to consider Saudi Arabia a safe destination, the use of English in the PPP contract was permitted, as this is now a language admissible in Saudi courts.

To support these reforms and promote PPP projects, Saudi SV2030 mandated the creation of a PPP unit, the National Centre for Privatisation (NCP) and PPP, established in April 2017 [33]. The NCP addresses Saudi Arabia’s lack of a PPP-supporting institutional structure and provides a wide range of services to both the public and private sectors through increased awareness of PPPs’ importance, the provision of training programmes to public and private entities, the marketing for local PPP projects at international conferences, and the learning of lessons from international best practices [28].

Besides providing these services, the NCP controls the PPP project pipeline of all ministries (this pipeline refers to the projects listed by the government as having PPP potential). At the time of accessing the NCP’s public site, 120 projects were in its pipeline, and its investment could ascend to an aggregated amount of over SAR 90 billion (USD 23 billion) [35]. The execution timeline is undetermined but is expected to extend from three to five years. These projects mainly concentrate on basic infrastructure, such as desalination plants, sewage systems, road development, hospitals, and schools. Nonetheless, KSA has an estimated infrastructure gap of about 0.5 per cent of its GDP, or about USD 4.2 billion annually [36].

While the actual pipeline of projects is ambitious and expected to continue growing, the continuous successful implementation of these PPP projects while maintaining the current budget spending on infrastructure could determine the closure of the existing
2.3. Determinant Features and Critical Factors for PPP in the Developing World

Some studies in the literature have labelled the features determining how PPP projects can be facilitated as “critical success factors (CSFs)”. While these terms may be considered interchangeable, a “factor” denotes factual circumstances or facts. On the other hand, a Determining Feature (DF) refers to distinct attributes or aspects about something that better correspond to given opinions. As the reviewed literature shows, the results of these CSF studies are typically obtained from opinions given through interview processes by different parties without sufficiently appraising the knowledge or biases of the interviewees. Nonetheless, this research delved into the literature related to CSFs to determine the elements (features) at play and the methodologies and analyses used.

Petersen (2011), Biygautane (2017, 2018) [10,15,34], and many other authors expressed the volatile levels of success that PPP projects have produced over time. Researchers worldwide have attempted to understand the features needed to create successful PPP projects, mainly using case studies, questionnaire surveys, or a combination of both as the methods to analyse what makes PPPs successful. Through these studies, authors have been able to identify and/or classify and/or evaluate the factors or features that make PPP projects successful in different countries or under specific conditions. This research attempts to identify what features will determine KSA’s ability to have more and better PPP projects to close its infrastructure gap and align with its SV2030 plans.

Among the many countries where studies were conducted, China was prominent, taking on several studies to assess the CSFs that make PPP projects work. For instance, Yang et al. (2017) [37] issued a framework proposal for BOT projects based on a questionnaire research analysis issued to professionals working in China on BOT projects. The qualitative study concluded that 10 specific factors out of the 27 investigated were critical in preparing, bidding, constructing, operating, and transferring BOT projects in China. On the other hand, Zhang (2005) [38] used a different approach based on case studies and previous research on questionnaire surveys of international expert opinions in various countries, such as the UK, the USA, China, Thailand, the Philippines, Sri Lanka, and India. It concluded that there is an agreement between the industry and academic experts that success factors could be classified into 5 main ones, distilled from up to 50 different subfactors considered in the other questionnaires.

China is not the only country in Asia that has researched this topic. In Indonesia, Lumban Gaol et al. (2023) [39] determined the three fundamental factors to populate PPP projects in the road sector through a quantitative descriptive approach leveraging CSF indicators from previous researchers. They used a questionnaire that was responded to by 62 private sector and 5 government individuals working in road sector development.

Likewise, in Vietnam, Hai et al. (2022) [40] structured 42 factors obtained from a comprehensive literature review that were further grouped into six primary cluster categories. Then, data collected from a questionnaire responded to by 216 PPP infrastructure professionals and practitioners were treated through the formulation of a theoretical structural equation model to determine the impacts of these clusters on PPP infrastructure project implementation. The findings indicated that some clusters were more influential than others, affecting the success of implementing PPP projects. Likewise, Nguyen et al. (2020) [41] also studied the success factors in Vietnam’s PPPs, finding five critical success factors through the word cloud technique and the one-way analysis of variance (ANOVA) of data obtained from a survey with 150 respondents.

Ngullie et al. (2021) [42] researched the CSFs that could encourage the creation of PPP projects in solid waste management in India using a mixed research approach comprising qualitative and quantitative methods. The success factors were determined by identifying an initial list of 25 critical success factors related to the solid waste sector, which different experts later reviewed for refinement; the result was a reduced list of 17 critical success
factors. Furthermore, the success factors of ten PPP projects in solid waste management in India were analysed through a literature review to confirm the usability of these features in a questionnaire, whose outcomes were used for the quantitative approach. The survey obtained 225 valid responses from different stakeholders. The statistical test determined that the main stakeholder groups (public and private) have different perceptions of the importance of the different factors.

Studies on similar topics are also found in Africa. Ahmadu et al. (2023) [43] conducted a gap analysis of CSFs for Nigeria’s tendering stages of PPP infrastructure projects. They evaluated 32 factors obtained from 70 valid survey responses from PPP project professionals involved in the tendering phases of PPP projects. The questionnaire contained closed-ended questions based on findings from a relevant literature review. The resulting CSFs were grouped into quadrants, grading their importance using the average mean based on the observed importance. While this study focused on the tender processes for PPPs in general, a more narrowly specific study conducted by Temitope et al. (2023) [44] used a quantitative approach to study the critical risk factors of the Mass Housing Project (MHP) procured under a PPP. The researchers sent questionnaires to the stakeholders involved in PPP-MHP registered with PPP departments in Abuja, Nigeria. The 68 identified risk factors were given to participants to score using the Mean Item Score (MIS) for risk occurrence and its severity. In contrast, a risk significance index (RI) was used to determine the risk impact. Later, they applied a Fuzzy Synthetic Evaluation (FSE) method to determine the criticality of the risk groups and the overall risk level in the sector.

These studies reveal the distinctive features relevant to implementing PPP projects in different countries. As mentioned earlier, creating PPPs in countries with particular legal frameworks, such as Sharia, could pose challenges in following the usual PPP standards. For this reason, reviewing the literature on these specific countries was essential to understanding the differences from other countries.

Although Malaysia follows a hybrid legal system, it has long-standing PPP experience. The research of A. Khalifa et al. (2021) [45] tried to demonstrate which hypothetical factors are more relevant to creating PPPs in Malaysia by using a quantitative methodology to validate the measurements, as well as hypothesis testing and the validation of structural models of PPP implementation. Unlike the other studies, this one used data obtained from a previous survey with 238 respondents, which contained only eight factors identified by the earlier authors (Cheung et al. (2012)) [46] as the critical success factors in Malaysia. The data were treated using a structural equation modelling (SEM) statistical method capable of assimilating a confirmatory factor analysis CFA measurement. The model provided quantitative values to these success factors and numerically validated some empirical interactions among them.

The UAE government profusely promoted PPPs to procure infrastructure projects, but they have had limited experience with this novel mechanism. Al-Saadi and Abdou (2016) [47] attempted to identify the success factors for adopting such an approach in the UAE. They conducted twenty-one in-depth interviews with PPP experts and key personnel with experience in the development life cycle of PPP infrastructure projects in the UAE. Their goal was to obtain the experts’ opinions and determine the relative importance of each of them in their country. The results revealed that the five most relevant CSFs for all respondents were the availability and effectiveness of a proper regulatory and legal framework; adequate risk allocation and sharing among project stakeholders; a straightforward project brief and client outcomes; the comprehensive and business viability of a project feasibility study; and finally, proper project value management systems during different project stages.

Subsequently, Alteneiji et al. (2020) [23] conducted an empirical study with a similar methodology in the UAE’s affordable housing sector under PPPs. They identified 17 CSFs derived from previous international and local studies and conducted a survey among stakeholders from the public and private sectors in the country. They analysed data obtained from 48 valid responses using the relative importance index technique to establish
the most significant factors. The six most common CSFs identified by the participants were good governance, government guarantees, the commitment and responsibility of the public and private sectors, favourable and efficient legal frameworks, political support and stability, and the demand for the debt-paying ability of the project.

In KSA, despite the low number of projects executed to date, there have been studies attempting to discern the features facilitating PPP projects. In this line of research, Alshahrani et al. (2023) [48] published a paper on a particular topic: the success factors for implementing PPPs for affordable housing in Makka. They used quantitative methods to clarify existing relationships in qualitative data. The success factors, being that specific, were obtained through a literature review and focus groups with PPP experts in affordable housing in Makkah. They identified 5 major cluster factors underlying another 30 different subfactors. The questionnaire returned 85 valid responses from stakeholders comprising public and private sector officials in Makka who participate in PPP housing and real estate development. The survey’s findings were analysed using the SPSS software for factor analysis. The five major success features found in the study were an adequate legislative framework, a sound financial package, the project’s economic viability, judicial government control, and a robust private sector.

On the other hand, Jubair and Singh (2022) [27] conducted a more generic study about the CSFs of PPPs in Saudi Arabia. The research conducted a quantitative study to measure factors conceptualised from the literature review, which led to a survey form. This survey was explicitly sent to all the participants of the three PPP projects considered successful in Saudi Arabia: (i) the Hajj Terminal at King Abdul-Aziz International Airport mega project, (ii) the Independent Water and Power mega project, and (iii) the Medina Airport mega project. This survey returned 543 valid responses, which were treated using a structured equation model test. The results show associations among the different factors based on the values obtained on a framework. Ultimately, three factors are shown to significantly influence the success of private–public partnership projects at both the strategic and operational levels: (i) risk sharing and allocation practice, (ii) procurement transparency practice, and (iii) knowledge management practice.

With the above review, it can be concluded that there are sufficient research opportunities for this study for the following reasons:

- There is a limited amount of research providing a quantitative analysis of the features that make PPP projects successful.
- The studies showed that, while the factors (features) studied are relatively static in most research, they vary across countries and regions.
- In general, there is limited attention to PPP projects in the Middle East and GCC countries.
- The studies carried out on similar topics in KSA so far are very specific, either to the project type or to the sample of interview participants.

Hence, this study attempts to bridge part of these gaps by proposing an evaluation framework through a qualitative and quantitative analysis of the DFs of implementing infrastructure through the PPP scheme in KSA. It endeavours to assess the validity of this scheme in reducing its infrastructure gap and coping with the SV2030’s privatisation policy.

3. Research Methodology

This study used a quantitative and qualitative approach through a survey among PPP experts interviewed using a four-stage methodology approach to meet the research objectives: (i) the identification of possible DFs in the success of PPP in KSA; (ii) the preparation and sending of a questionnaire to international experts; (iii) the qualitative analysis of the responses received; and (iv) the descriptive and quantitative treatment of the data collected. The outcome of this research is an assessment of the DFs that may facilitate the population of PPP infrastructure projects in KSA.

Questionnaire surveys are widely used as research tools because they effectively measure practitioners’ opinions and collect and relate data. The questionnaire used in this research was built by leveraging the literature reviewed and other documents acquired
during the research to list the features to be analysed. A total of 12 different questionnaires were used in this process. However, some of the selected features were modulated to correspond with the conditions of KSA with the assistance of Saudi PPP practitioners and other experts because of cultural, legal, or country-specific nuances [49].

The survey consisted of several questions divided into two blocks. The first block of 12 questions (PREV1, PREV2, . . ., and PREV12) was used to identify the respondents’ backgrounds. The information obtained was valuable in determining the validity of the responses and was used to classify them further. The second block contained all the relevant questions for the study; a list was created with all the generic DFs identified to facilitate PPP project implementation. They consist of a series of questions structured in four sections:

✓ Section 1. A five-point Likert scale (a Likert scale is a unidimensional scale that researchers use to collect respondents’ attitudes and opinions; the five-point scale consists of the following points: very high = 5, high = 4, average = 3, low = 2, and little or none = 1) where respondents were asked to rate their perceptions of the importance of each feature. This section includes a total of 17 questions, labelled DF1, DF2, . . ., and DF17.

✓ Section 2. A five-point Likert scale where respondents were asked to rate the suitability of the infrastructure typology to be developed through PPP. It includes ten questions labelled WT1, WT2, . . ., and WT10.

✓ Section 3. YES/NO questions where respondents were asked to show agreement or disagreement with a particular statement. This section includes 15 questions labelled ANS1, ANS2, . . ., and ANS15. Some of these questions had a third choice, consisting of either a NOT SURE statement or the possibility to expand their responses.

✓ Section 4. A set of open-ended questions where the participants were asked to express a free opinion or to specify what they believe is more relevant to the specific question.

The questions that provided numerical data were used to produce a descriptive analysis and quantitative evaluation, while the questions with YES/NO responses or with open statements and open questions were used to validate this qualitative evaluation, complementing the quantitative results.

The questionnaire was created using Google Forms for simplicity and accessibility by all parties. This platform facilitates the division of different blocks by themes in creating forms, simplifying the segmentation of the survey while being very user-friendly. The survey was also anonymous, although the respondents were invited to provide some personal data at the end to facilitate a copy of the results once the survey was finished and the data were compiled.

3.1. Analysis and Modelling

The analysis of the survey output comprised two steps: (i) a descriptive analysis of the data collected through the survey and (ii) an exploratory factor analysis (EFA) to identify DFs of the success of PPP in KSA.

EFA is a statistical method within factor analysis used to uncover the underlying structure of relatively large sets of variables and identify the causal relationships between measured variables. So, factor analysis is a mathematical tool used to identify the structure/dimensionality of observed data and reveal the underlying constructs that give rise to observed phenomena. The techniques identify and examine clusters of intercorrelated variables; these clusters are called “factors” or “latent variables”. In statistical terms, factor analysis is a method to model the population covariance matrix of a set of variables using sample data. In our study, EFA allowed for clustering a large number of DFs into a few explanatory factors.

3.2. Sample Characteristics

The questionnaire was sent by email to 118 participants with the pre-requisite that they should be PPP practitioners in KSA or have knowledge of PPPs in KSA, irrespective of their sector. The list was selected from a database of more than 3500 professional contacts in
the LinkedIn networks of the authors of this research. The goal was to undertake a survey that provided different views from diverse stakeholders. The survey offered a classification to identify responders in different categories. However, there was an option to insert an alternative category in case someone could not describe himself/herself with any of the listed ones:

a. Government;
b. Local Government Organisation;
c. Bank, Investment Firm, or Financial Institution;
d. Consulting Firm;
e. Design and/or Construction Firm;
f. PPP Operator or Infrastructure Developer/Concessionaire;
ga. Law Firm;
h. Academia;
i. Think-tank/Research;
j. Other, please specify.

Priority was given to those working in KSA and GCC countries, but because of the limited number of potential participants due to the reduced experience in PPPs in the country, it was later expanded to other countries. The rationale behind this is that there were PPP practitioners who, while familiar with the KSA conditions, were based outside the country.

The data were collected between July and September 2023, garnering a response rate of 41.53 per cent from 49 respondents. This response rate is considered average compared to other research studies.

A control question was introduced at the end of the first block of the questionnaire to validate the obtained responses, where responders could express their opinion on whether they agree that PPPs are a good scheme for providing infrastructure in KSA. In the case of negative answers, the subjects had the opportunity to elaborate further.

This question and the explanations obtained were used to distil the responses. Of the four answers in the negative, three responses elaborated further, and one of them provided the most expected remark, “PPPs are unsuitable for KSA because it has enough money to pay for its infrastructure”.

For the purpose of this study, the questionnaires with a NO response to this control question were considered invalid. This leaves the data sample with 45 valid questionnaires, or a 36.5 per cent valid response rate, which is already a decent sampling pool considering the novel practice of PPP in KSA. This number is also comparable to other studies of this nature. For instance, Cheung et al. (2012) [46] obtained 45 responses, Wibowo and Alfen (2015) [50] obtained 41 responses, and Altenexji et al. (2020) [23] obtained 48 responses.

The data reveal that the survey participants represented a good diversity of sectors. Of the respondents, 17.7 per cent were from the public sector, of which 11.1 per cent corresponded to government institutions, 2.2 per cent to local government institutions, 2.2 per cent to companies owned by the government, and 2.2 per cent to a company targeting privatisation. These last two were new classifications proposed by the respondents. Excluding academia, the private sector occupies 66.7 per cent, a perfect two-thirds proportion. The main private sector actors were PPP operators or infrastructure developers (22.2 per cent); consultants (28.9 per cent, where firms were 26.7 per cent and independent consultants added 2.2 per cent—also a self-created category); and banks, investment firms, or financial institutions (13.3 per cent). The underrepresented categories correspond to the construction and design firms and the law sector, accounting only for 2.2 per cent.

The outcome on the seniority of the participants indicates a predominantly senior-rank profile, with 46.7 per cent in higher management and 35.6 per cent in middle management. This representation suggests that their experience in PPP is extensive, thus providing a higher value to the results and conclusions. This senior experience in PPP is further confirmed, as the proportion of respondents with over ten years of experience in PPP is more than half, with 53.4 per cent of participants. Overall, the vast majority of the
respondents have ample experience in PPPs (97.8 per cent), as everyone would have been required to validate the responses. Only 2.2 per cent, or one person, declared not having this level of experience.

Also, the participants were predominantly based in KSA, the GCC, or the Middle East (60 per cent) and, therefore, were familiar with the singular elements of the country. However, it cannot be disregarded that a few participants in other countries were also familiar with these conditions, as among the invitees, there were PPP practitioners who lived or worked in KSA. In reality, some invitees declined to participate based on their insufficient knowledge of the country or its conditions for implementing PPP projects in KSA. So, it can be considered that most of the admitted responses were from subjects with sufficient knowledge of KSA or the conditions of PPP in that environment.

4. Results

This section introduces the outcomes of the qualitative and quantitative data analysis of the data gathered.

As explained above, different question sets were treated with different analyses. The questions returning numerical values were treated using the XLSTAT-Student 2023.2.1414.1414 statistical package, while the rest of the questions, providing non-numerical responses, were analysed qualitatively.

There were two different non-numerical responses: the ones with a YES/NO type of answer, which also had a third option, i.e., Not Sure or an opinion, and those offering the opportunity to provide a straight opinion. As previously mentioned, these questions were organised in Sections 3 and 4, and the responses refined the understanding of the features for populating PPP projects in KSA.

4.1. Quantitative Analysis

4.1.1. Descriptive Analysis

As mentioned previously, Section 1 includes a set of 17 questions where respondents rated their perceptions of the DFs of the success of PPPs in KSA. These DFs were the following:

- DF1. Transparent and efficient bidding process.
- DF2. Political support.
- DF3. Good governance.
- DF5. Mature and available local financial market.
- DF7. Proper risk allocation.
- DF8. Stable political and social environment.
- DF9. Multiple benefit objectives of all stakeholders.
- DF10. Existence of a specialised PPP unit within the government.
- DF11. Government involvement through the provision of guarantees.
- DF15. Technical and economic project feasibility.
- DF16. Commitment and accountability of the public and private project partners.
- DF17. Society in general.

Table 1 shows the descriptive statistics of the DFs.

In general, all the DFs obtained a high average rating, proving that respondents agreed with the questions. Nevertheless, this agreement was lower (medium) in DF numbers 5 (adequacy of financial market), 10 (existence of a specialised PPP unit within the government), and 14 (existence of capable private sector). The variances obtained show little dispersion in the responses.
Section 1 also includes a set of 10 questions where respondents rated the typology of infrastructures more suitable to be built through a PPP. These infrastructures were the following:
✓ WT1. Roads.
✓ WT3. Railway.
✓ WT4. Ports.
✓ WT5. Sanitation.
✓ WT6. Desalination.
✓ WT7. Public buses/local transport other than Metro.
✓ WT9. Hospital and health centres.
✓ WT10. Schools and educational centres.

Table 2 shows the descriptive statistics of this section.

## Table 1. Descriptive statistics of DFs.

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## Table 2. Descriptive statistics of WTs.

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</table>
The infrastructure projects with the most significant acceptance among the respondents to be developed under a PPP modality were ports, desalination, and hospital and health centres. On the other hand, roads, public transportation systems, and public buildings showed less acceptance.

4.1.2. Factor Analysis

Factor analysis (FA) is an interdependence technique whose primary purpose is to define the underlying structure among the variables in the analysis [51]. It is helpful in survey analysis whenever the phenomenon of interest is complex and not directly measurable via a single question [52]. This technique was applied to the survey data to explore potential combinations or groups of DFs, providing more clarity to the data evaluation.

The FA shows that these seventeen DFs can be grouped into four principal factors, which explain 68.93 per cent of the total variance of the original variables. However, an orthogonal Varimax factor rotation method was also used (with orthogonal rotation, the factors are not correlated) to maximise the variance of each factor, so the total amount of variance accounted for was redistributed over the four extracted factors. In addition, factor rotation transforms the initial factors into new ones that are easier to interpret.

Table 3 shows the correlation matrix of the 17 DFs. This matrix gives us the correlation coefficients between variables. Values in bold represent correlations different from zero with a significance level equal to 0.05.

Table 3. Correlation matrix (Pearson).

<table>
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<tr>
<th>Variables</th>
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<th>DF4</th>
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<th>DF11</th>
<th>DF12</th>
<th>DF13</th>
<th>DF14</th>
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<th>DF17</th>
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<td>0.32</td>
<td>0.16</td>
<td>0.51</td>
<td>1.00</td>
</tr>
</tbody>
</table>

Values in bold are different from 0 with a significance level alpha = 0.95.

Valuable information can be obtained from the correlations between the different variables, as will be seen later in the Discussion Section.

The validity of the data obtained from the FA was further verified using the KMO statistical test (Kaiser–Meyer–Olkin), the Bartlett sphericity test, Cronbach’s alpha, and the determinant of the R-matrix (of correlations). The values found were as follows: KMO = 0.65 (>0.60) (a value greater than 0.6 shows a high intercorrelation, making factor analysis appropriate); Bartlett’s sphericity test: 457.16 with p < 0.0001 (Table 4); Cronbach’s alpha (a measure of reliability that ranges from 0 to 1, with values of 0.70 deemed the lower limit of acceptability): 0.95 (>0.70); and correlation matrix determinant = 5.076 × 10⁻⁶ (a very low value shows a high intercorrelation in the correlation matrix, making factor analysis appropriate).
Table 4. Bartlett’s sphericity test.

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Chi-square (observed value)</td>
<td>457.16</td>
</tr>
<tr>
<td>Chi-square (critical value)</td>
<td>110.06</td>
</tr>
<tr>
<td>DF</td>
<td>136</td>
</tr>
<tr>
<td>p-value (two-tailed)</td>
<td>&lt;0.0001</td>
</tr>
<tr>
<td>alpha</td>
<td>0.95</td>
</tr>
</tbody>
</table>

The Kaiser–Guttman criterion is used for the number of factors extracted, which entails choosing only those with an eigenvalue greater than 1. It was found that there would only be four factors according to the Kaiser–Guttman criterion, explaining 68.93 per cent of the total variance (Figure 1 and Table 5).

![Sedimentation test and percentage of cumulative variability](image)

**Figure 1.** Sedimentation test and percentage of cumulative variability.

Table 5. Principal component analysis. Main four eigenvalues.

<table>
<thead>
<tr>
<th></th>
<th>F1</th>
<th>F2</th>
<th>F3</th>
<th>F4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Eigenvalue</td>
<td>7.441</td>
<td>1.627</td>
<td>1.416</td>
<td>1.234</td>
</tr>
<tr>
<td>Variability (%)</td>
<td>43.769</td>
<td>9.573</td>
<td>8.327</td>
<td>7.260</td>
</tr>
<tr>
<td>Cumulative %</td>
<td>43.769</td>
<td>53.342</td>
<td>61.669</td>
<td>68.929</td>
</tr>
</tbody>
</table>

As mentioned earlier, a Varimax rotation has been applied to ensure that the latent factors are uncorrelated. Table 6 shows the factor loadings (a factor loading is basically the correlation coefficient for the variable and the factor and indicates how much a factor explains a variable) for the observed items and the four principal components revealed (factors). Items DF4, DF5, and DF10 were eliminated following Hair et al.’s (2010) [51] recommendations because of their low factor loadings (<0.50). The rest of the items have considerably good loads.

Table 6. Percentage of variance after Varimax rotation.

<table>
<thead>
<tr>
<th></th>
<th>D1</th>
<th>D2</th>
<th>D3</th>
<th>D4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Variability (%)</td>
<td>24.85</td>
<td>14.26</td>
<td>20.76</td>
<td>9.06</td>
</tr>
<tr>
<td>Cumulative %</td>
<td>24.85</td>
<td>39.12</td>
<td>59.87</td>
<td>68.93</td>
</tr>
</tbody>
</table>

The FA indicates that seventeen DFs can be grouped into four principal factors, labelled as D1, D2, D3, and D4. These factors can be interpreted as follows:
✓ D1 represents the project’s implementability and accounts for 24.85 per cent of the total variance amongst the DFs.
✓ D2 represents a favourable project environment and accounts for 14.27 per cent of the total variance amongst the DFs.
✓ D3 represents the project’s effective procurement system and accounts for 20.76 per cent of the total variance amongst the DFs.
✓ D4 represents the political support and accounts for 9.06 per cent of the total variance amongst the DFs.

4.2. Qualitative Analysis

The first question in Section 3 (ANS1) referred to the benefits of PPPs and whether or not using PPPs in KSA will enable faster project implementation compared to the traditional funding mechanism. The responses were overwhelmingly positive, as 33 out of the 45 were in the affirmative. Out of the total, six responses provided explanatory feedback from those with an in-between opinion. These elaborations were quite diverse, providing no additional conclusions or leading to any specific elements to be considered.

The second question surveyed (ANS2) was whether PPPs provide non-monetary benefits for KSA society. The response was even more explicit, providing 41 positive answers that acknowledge the benefits that PPPs can bring to KSA’s society.

Nonetheless, when enquiring about the potential hidden costs that PPP implementation could entail to KSA society (ANS3), there were divergent opinions, as only 24 were positive. This figure, in a sense, implies that the majority of the people/respondents believe that PPPs provide more benefits than costs in general. This thought is strengthened by the alternative responses, which predominantly considered that the potential costs have more to do with the implementation of the projects than the system itself, which was what the question attempted to extract.

When asked about the appropriateness of the existing legal framework in KSA to promote a healthy pipeline of PPP projects (ANS4), there was a disparity of opinions, as the number of positive responses was nearly the same as the number of negative and OTHER responses. Some opinions expressed that the existing legal framework is insufficiently prepared to deal with the different facets of PPP projects, such as taxes and organisation, but a few other respondents declared their lack of knowledge of the legal framework in KSA.

The following question in this section referred to the general environment for developing PPP projects, including the legal framework, financial regulations, the political environment and other conditions, and its suitability to attract the private sector (ANS5). More specifically, the question asked whether this environment could prevent interested private sector parties from executing projects in Saudi Arabia. This question involved the possibility that foreign parties could be deterred from accessing the PPP market because of the existing conditions or that local parties are not inclined to participate in PPP projects because the current regulations are not sufficiently favourable.

Though most respondents thought that the environment might pose hurdles for the participation of some private sector parties, 25 per cent considered that the existing environment should be good enough or that the existing conditions are not the reason why some private sectors may not be involved in PPP projects.

The survey inquired deeper into potential hindrances that may be slowing PPPs’ progress in KSA and asked open questions, where respondents were allowed to expand on their opinions according to their experience. The responses were diverse, indeed. However, there were repetitive themes into which the responses could be grouped. The number of responses related to these themes was used to gauge how relevant these themes were to the respondents’ opinions.

The first open question was related to the limited participation of the private sector in implementing PPP projects in KSA. Overwhelmingly, the responses indicate that the lack of experience in the private sector or its lack of understanding of the goals of PPPs is the main
limitation. This lack of knowledge or understanding was associated with little potential interest or knowledge from the private sector to undertake the project risks that PPPs typically transfer. The second most mentioned limitation was financial, which combines the lack of funding or access to funding, insufficient remuneration for the projects, or potential limitations or conditions levied by Islamic finance. The third most mentioned was the legal limitations. The immature regulatory framework enforced by inexperienced authorities deters the private sector from participating because of the lengthy administrative processes.

After knowing the limitations for the private sector to participate, it was fair to ask what benefits, in their opinion, were in the public sector’s hands to motivate the private sector to participate in infrastructure provision. The vast majority of the responses referred to improving the government’s abilities in one way or another. These responses put emphasis on the government’s ability to prepare better projects, streamline processes, and provide sufficient guarantees to boost the private sector’s confidence. The last category borders another more widespread factor among responses—the financial. In this category, responders reviewed the usual suspects expected from the government towards the private sector to increase PPP projects, such as grants, guarantees, tax rebates, and funding.

The following question referred to the public sector’s limitations in implementing infrastructure through PPP. The goal was to determine where the hindrances are on the public sector side preventing the population of PPP projects in KSA. The predominant responses were connected with the public sector’s lack of capacity to prepare, understand, or deal with PPP projects and their processes. The second most predominant topic was the connection between slow processes and government bureaucracy as limitations to implementing more projects. The last representative topic out of the responses referred to funding support for these projects from the government. As many are designed through availability payments, some people express constraints on the commitment, while others stress the lack of funding to issue these payments.

The following questions in Section 3 integrated questions concerning value for money (VfM). They intend to clarify whether the VfM methodology is in practice in selecting projects and its usefulness in the context of KSA (ANS6 to ANS10). The answers to the different questions indicate that VfM is being used in KSA to select projects, and a positive VfM assessment is a DF of the projects’ success.

The following questions in this section deal with risk identification and assessment from the public and private sides (ANS11 to ANS15). From the results obtained, the perception from the responders is that the public sector has difficulties identifying and valuing project risks correctly, as well as determining what risk to retain and which to transfer to the private sector. On the other hand, participants agreed that the private sector can identify project risks better, but the responses suggest that it may struggle to assess the value of these risks.

The results further explained the perception of both parties’ capabilities in the preparation and participation in PPP projects, conveying that both the public and private sectors lack experience and knowledge in PPP project preparation and evaluation. These are, indeed, obstacles to creating more successful PPP projects.

The questionnaire concluded with an open question, where respondents expressed their opinion on how to create more and better PPP projects in KSA, guided by the questionnaire. Respondents provided a variety of topics, which were grouped as previously, according to the topics stressed in the responses. These groups were coherent with the inputs given in previous questions. The comments were evenly distributed amongst knowledge, risk allocation–mitigation, and finance and profitability, while the last major topic referred to the many other elements connected with the project preparation and capacity.

Regarding knowledge, the comments suggested enhancing the existing knowledge base of both the public and private sectors on PPP projects. The goal is to increase the soundness of the projects proposed by the authorities as well as to make the private sector focus less on the execution and more on the services of the long-term contract provision.
In terms of risk allocation and mitigation, the opinions correspond with the previous question, where neither of the two main stakeholders seemed to be conscious of the importance of risk management. In this fashion, the suggestions were to be acquainted with risk analysis and allocation and to balance and compensate with regard to what assuming these risks entails for both the public and private sectors. Concerning finances and profitability, the suggestions opened to broader elements, such as financial modelling and financial capabilities or sovereign guarantees, to enhance the bankability of particular projects.

5. Discussion

The quantitative analysis shows a high mean rating obtained for all DFs, suggesting that respondents highly agree with the statements on these DFs. However, this agreement weakens, not reaching a value of 4, concerning the adequacy of the financial markets (DF5), the presence of a specialised PPP unit (DF10)—the one with the lowest score—and the existence of a private sector capable of participating in PPP projects (DF14).

These lower ratings preconditioning less-determinant factors in the population of PPP projects in KSA may be explained by the following:

- The local financial markets are robust and very liquid compared to other countries. In addition, there is a tight financial interconnection with other financial markets in the GCC region [53].
- Dedicated PPP units are generally not synonymous with more and better projects. Most PPP Guidelines suggest the role of PPP units as one accountability mechanism without much elaboration. Some Guidelines, such as those of the OECD (2008), suggest that these PPP units should only provide PPP oversight without any hand in decision-making; others suggest that PPP units can take on a large variety of work, including liaison, promotional, or programme management support roles, which could potentially create conflicts of interest [9]. In the case of KSA, the NCP has a more prominent role than other PPP units in the world, but despite this power, its interaction with other line ministries and agencies has not significantly enhanced the population of projects so far.
- While the private sector in KSA does not have strong champion companies other than the government companies involved in the oil and gas industry, the number of potential projects and their impacts in economic terms tend to be an attraction point for many foreign companies with the required skills and capabilities.

Regarding the typology of the projects, the data suggest that PPPs may be more suitable for the construction of ports, desalination plants, and hospitals and health centres. This information is consistent with the government’s strategy to consider using PPPs in strategic projects and service provision.

The correlation matrix provides highly valuable information about how the different DFs are interrelated. Some of the most representative findings are as follows:

- A transparent and efficient bidding process (DF1) is highly correlated with the commitment and accountability of public and private project partners (DF16). Transparent and efficient procurement has been a critical issue for the success of PPPs in different regions. In the case of KSA, there is an appropriate legal framework for PPP promotion.
- Political support (DF2) is not representatively correlated with the rest of the variables. It could be stated that it is an “a priori” condition.
- Good governance (DF3) correlates highly with proper risk allocation (DF7). Establishing the institutional, regulatory, and legal framework for PPPs allows flexible risk sharing between the public and private sectors, encouraging the private sector to make long-term investment decisions.
- The existence of a mature and available local market (DF5) is highly correlated with a transparent and efficient bidding process (DF1) and the existence of a capable private sector (DF14).
• The stakeholders’ support and acceptance (DF6) is highly correlated with the existence of multiple benefit objectives for all of them (DF9) and the existence of a capable private sector (DF14).
• Proper risk allocation (DF7) is highly correlated with the technical and economic project feasibility (DF15). In the context of KSA, the Council of Economic and Development Affairs (CEDA) is responsible for developing PPP strategies, including correctly managing project risks.
• A stable political and social environment (DF8) correlates with a stable macroeconomic environment (DF13).
• The multiple benefit objectives for all stakeholders (DF9) is highly correlated with DF6 (as mentioned before) and a comprehensive and realistic cost–benefit analysis (DF12).

On the other hand, the FA has provided four main factors that could explain how PPPs could flourish in KSA: D1, D2, D3, and D4.

The contribution of all the variables (DF1, DF2, . . ., DF17) after Varimax rotation to each principal factor $D_i$ is equal to 100. In any case, the percentage of the total variability of the DFs that each factor $D_i$ explains needs to be considered, as indicated in Table 7.

**Table 7. Factor loadings after Varimax rotation.**

<table>
<thead>
<tr>
<th></th>
<th>D1</th>
<th>D2</th>
<th>D3</th>
<th>D4</th>
</tr>
</thead>
<tbody>
<tr>
<td>D1</td>
<td>DF15. Technical and economic project feasibility.</td>
<td>0.856</td>
<td>0.074</td>
<td>0.083</td>
</tr>
<tr>
<td></td>
<td>DF9. Multiple benefit objectives of all stakeholders.</td>
<td>0.773</td>
<td>0.295</td>
<td>0.196</td>
</tr>
<tr>
<td></td>
<td>DF7. Proper risk allocation.</td>
<td>0.744</td>
<td>0.064</td>
<td>0.461</td>
</tr>
<tr>
<td></td>
<td>DF6. Stakeholders’ support/acceptation.</td>
<td>0.714</td>
<td>0.149</td>
<td>0.309</td>
</tr>
<tr>
<td></td>
<td>DF12. Comprehensive and realistic cost–benefit.</td>
<td>0.703</td>
<td>0.444</td>
<td>0.069</td>
</tr>
<tr>
<td></td>
<td>DF14. Existence of capable private sector.</td>
<td>0.585</td>
<td>0.235</td>
<td>0.504</td>
</tr>
<tr>
<td>D2</td>
<td>DF8. Stable political and social environment.</td>
<td>0.200</td>
<td>0.888</td>
<td>0.090</td>
</tr>
<tr>
<td></td>
<td>DF13. Stable macroeconomic environment.</td>
<td>0.326</td>
<td>0.850</td>
<td>0.142</td>
</tr>
<tr>
<td>D3</td>
<td>DF16. Commitment and accountability of the public and private project partners.</td>
<td>0.212</td>
<td>0.192</td>
<td>0.762</td>
</tr>
<tr>
<td></td>
<td>DF11. Government involvement through the provision of guarantees.</td>
<td>0.150</td>
<td>0.036</td>
<td>0.748</td>
</tr>
<tr>
<td></td>
<td>DF1. Transparent and efficient bidding process.</td>
<td>0.367</td>
<td>−0.105</td>
<td>0.723</td>
</tr>
<tr>
<td></td>
<td>DF17. Society in general.</td>
<td>−0.065</td>
<td>0.542</td>
<td>0.616</td>
</tr>
<tr>
<td></td>
<td>DF3. Good governance.</td>
<td>0.386</td>
<td>0.352</td>
<td>0.543</td>
</tr>
<tr>
<td>D4</td>
<td>DF2. Political support.</td>
<td>0.049</td>
<td>−0.015</td>
<td>0.030</td>
</tr>
<tr>
<td></td>
<td>DF4. Favourable legal framework.</td>
<td>0.468</td>
<td>0.085</td>
<td>0.361</td>
</tr>
<tr>
<td></td>
<td>DF5. Mature and available local financial market.</td>
<td>0.349</td>
<td>0.127</td>
<td>0.493</td>
</tr>
<tr>
<td></td>
<td>DF10. Existence of a specialised PPP unit within the government.</td>
<td>0.389</td>
<td>0.231</td>
<td>0.421</td>
</tr>
</tbody>
</table>

D1 represents project implementability. This factor explains 76.42 per cent of all the features and depends on the technical and economic project feasibility (17.33 per cent), the existence of multiple benefit objectives for all stakeholders (14.14 per cent), proper risk allocation (13.11 per cent), stakeholder support and acceptance (12.08 per cent), a comprehensive and realistic cost–benefit analysis (11.68 per cent), and the existence of a capable private sector (8.09 per cent). This factor explains the success of PPPs in KSA to a greater extent.

D2 concerns a favourable and stable political, social, and macroeconomic environment. It explains 62.28 per cent of all features and depends on DF8 (32.50 per cent) and DF13 (29.78 per cent).

D3 represents the importance of an effective procurement system. It explains 66.22 per cent of all the features and depends on the commitment and accountability of the public and private sectors (16.46 per cent), the provision of guarantees by the government (15.85 per cent), the transparency and efficiency of the bidding process (14.80 per cent), society (10.76 per cent), and good governance (8.35 per cent).
D4 is a political support factor. Political support explains 53.39 per cent of this factor.

It can be seen that there is a convergence between the results obtained from the quantitative and the quantitative studies. Effectively, the factor analysis determined the topics that were voiced by the respondents in their responses to the open questions. The outcomes of questions ANS11 to ANS15 revealed that the areas to be improved to populate the majority of PPP projects were project preparation, risk allocation and mitigation, and financial analysis and profitability—elements that are comprehensively included in factors D1 and D3 and that, when combined, represent nearly half of the total variance of the DFs.

6. Conclusions

Aside from the controversy about the usability of PPP as a tool for implementing infrastructure and services, it is clear that PPP is a challenging contractual arrangement that requires commitment, expertise, and a change in mindset from both the private and public sectors.

The results obtained are consistent between the quantitative and qualitative analyses and provide an interesting trend regarding the elements that require improvement to make the PPP an instrumental tool to reduce the KSA infrastructure gap and provide the upsides expected in the SV2030 strategy. It would have been better to have a more significant number of responses to the survey so that the quantitative analysis would have shown sharper trends. However, the novel PPP activity in the Kingdom produces a limited number of practitioners with sufficient authority to provide valuable input. Also, there was limited access to these experts through the survey process.

It could be concluded that KSA has challenges similar to those of other countries in the region in implementing PPPs. Knowledge, in general, seems to be one of the most critical DFs, as this lack of knowledge prevents proper project preparation from the public sector and produces potentially wrong expectations from the private sector. This DF can also be extended to other stakeholders, such as financiers and lawmakers, who are not contributing to reducing the existing hurdles in implementing PPPs.

Better knowledge in the public sector side would improve the two groups (D1 and D3) representing nearly half of the factors that would enhance the PPP programme. With a more qualified public sector, there can be better technical and economic project feasibility, proper risk allocation, a more comprehensive and realistic cost–benefit analysis, and better transparency and efficiency in the bidding process, to name a few.

Bringing in qualified PPP practitioners to supplement this lack of internal knowledge is not complicated, but creating a fundamental change and making PPP an effective tool will require this knowledge to transpire throughout the whole administration, which is a longer process. Therefore, formalising PPP as a sound procurement mechanism will require time to be actualised in the administration.

On another note, KSA’s infrastructure development is very ambitious, making the infrastructure gap even wider, and for this, PPPs are proven to complement some infrastructure development plans in the best-case scenario, although not the solution to cover extensive development programmes. Thus, the KSA infrastructure gap can hardly be covered by PPP alone, and unless there are dramatic changes in the procurement system in a short period, it may not play an instrumental role in the SV2030 plans.

As a line of future research, it would be useful to study the implementation of the recommended factors in order to verify the success of the implementation of PPP projects. Another line of research would be to develop a cost–benefit analysis of the existing PPP projects in KSA.

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Conflicts of Interest: The authors declare no conflicts of interest.

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