The Impact of economic and political imperatives on the successful use of public-private partnership (PPP) in projects

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Abstract

This study presents empirical research examining how economic and political imperatives impact prospects for successful use of Public-Private Partnerships (PPP) to deliver projects in Saudi Arabia. A conceptual model and several hypotheses are developed. A questionnaire survey obtains data from two hundred and fifty-seven (257) project management practitioners involved in projects being procured using PPP within Saudi Arabia. Data is analysed using Structural Equation Modelling (SEM). The conclusion is that economic, but *not* political imperatives moderate the relationship between Critical Success Factors (CSFs) and PPP project success in Saudi Arabia. To an extent, these findings offer a risk-focused typology for exploring conditions for PPP project success.

Keywords: Public-Private Partnership; Economic; Political; Project Management; Construction Projects; Critical Success Factors; Structural Equation Model.

1.0 Introduction

1.1 Context

The Kingdom of Saudi Arabia is a high-income, developing country (Al-Hanawi et al. 2018; United Nations 2020; The World Bank 2021b). The Saudi economy is primarily dependent on revenue generated from petroleum resources and other oil-based products (Barbuscia 2019; Faudot 2019; International Trade Administration 2019; Sweidan and Elbargathi 2022). Saudi overreliance on petroleum and oil revenues has made its economy particularly susceptible to fluctuations in global petroleum and oil prices (Jawadi and Ftiti 2019; Waheed et el. 2020; Hathroubi and Aloui 2022). It has also placed considerable pressure on the national economy in infrastructure development (Almalki and Al-Hanawi 2018; Al-Hanawi et al. 2020). The Saudi government has responded by strongly pursuing new fiscal management policies focused on expanding the role of private sector in providing services traditionally deemed reserved for the public sector (Abid and Alotaibi 2020; Rahman 2020). The Saudi government has also announced that it will look to increase use of Public-private partnership (PPP) to meet the country's projected infrastructure needs.

Despite building institutional foundations to support PPP, including (i) passing a private sector participation law regulating PPP project risk allocations between public and private sector partners, (ii) initiating a programme of constant review of public sector projects for PPP suitability and (iii) attaining a number of notable successes with PPP, such as the recently completed Madinah Airport, the country has faced significant institutional, economic, political, bureaucratic, and cultural challenges with PPP implementation (Biygautane et al. 2016; Mansouri and Al-Ghamdi 2016).

1.2 Economic and political imperatives in PPP project delivery

This study refers to economic and political 'imperatives' to denote the idea that fundamental political and economic conditions, which can be captured as 'factors' for managerial categorisation purposes and viewed as 'influences' by academic researchers, also warrant labelling as 'imperatives' insofar as they warrant managerial attention to ensure successful project delivery. An evaluation of literature by Liu et al. (2018) suggests there are approximately six major research themes in PPP literature: (i) the role of the government, (ii) selection of concessions, (iii) identification and apportionment of risks, (iv) efficiencies, (v) financial considerations and (vi) critical success factors (CSFs). Our focus in this study is on CSFs. In the broader context of developing countries, literature appears unsettled on how

best to rank CSFs for criticality to success of PPP in projects (see Olusola Babatunde et al. 2012; Ameyaw et al. 2017; Alteneiji et al. 2020; Chileshe et al. 2020). However, of the numerous factors deemed likely to derail successful use of PPP in project delivery, scholars consistently call attention to the importance of unstable economic and/or political conditions (Sachs et al. 2007; Smith and Gannon 2008; Mazin, 2017; Alfraidi et al. 2020). Both types of factor are commonly implicated in influencing (i) the nature of the competition, (ii) the services provided, and (iii) the financial resources available to PPP projects (Winch 2009; Turner et al. 2010; Dewulf and Garvin 2020). In Saudi specific literature, there are as yet no emergent generalisations on CSF rankings by criticality for success of PPP projects (see Al-Hanawi et al. 2018, 2020; Al-Hanawi and Qattan 2019; Almalki and Al-Hanawi 2018; Al-Muawi et al. 2021; Biygautane et al. 2016; Biygautane 2017). However, a very recent study by Al-Hanawi et al. (2020) does at least suggest that barriers often tend to be (i) legal, (ii) environmental, or (iii) technological in nature.

The Saudi government is known to have allocated spending exceeding US$1.2 trillion on PPP projects over the last ten-year period (Advisory 2012; Biygautane et al. 2016; JLL 2017). In view of this scale of expenditure, it is vital for PPP finance and project management practitioners with an interest in Saudi infrastructure development to gain an understanding of not only key CSFs likely to affect successful use of PPP in project delivery, but also of whether and to what relative extents economic and political factors moderate such success. Thus, our research question:

RQ: How and to what extent do economic and political imperatives impact successful use of PPP as a procurement route for project delivery in Saudi Arabia?

To address this research question, the rest of this paper is organised as follows. Following this introduction (section one), in section two, we comprehensively review the literature relating to key concepts and constructs. In section three, we provide details of the conceptual model and some hypotheses that follow from it. The fourth section presents an overview of the research approach and procedures. The fifth section describes the data and analyses findings. Finally, findings are discussed, and conclusions are presented, in sections six and seven respectively.

2.0 The literature

2.1 Articulation

PPPs are institutionally embedded, contract-based forms of collaborative and cooperative enterprise. They are formed of public and private sector participants, and can endure under contract for decades for major infrastructure projects. (Wang et al. 2018a). This approach allows governments to procure major infrastructure by transferring responsibilities for raising construction finance to private sector partners, who are, in turn, likely to rely on equity investors and debt to fund construction (development and build) for physical assets, whose ongoing operation might then involve various forms of ongoing public-private co-operation. This is an alternative means of infrastructure funding, meaning that government is released from immediate fiscal pressures of having to finance projects directly from either government borrowing or tax income (National Audit Office 2018). This outsourcing of fiscal control entails, however, that highly uncertain and variable political and economic conditions bearing upon both public and private sector partners must come to the fore when theorising CSFs across long contract durations.

Although PPPs have attracted numerous definitions in the literature (see Broadbent and Laughlin 2003; Kwak et al. 2009; Custos and Reitz 2010; Roehrich et al. 2014; Osei-Kyei and Chan 2015; Cui et al. 2018; Wang et al. 2018a), they can be defined simply in their contractual aspect as "…*a long-term contract between a private party and a government agency, for providing a public asset or service, in which the private party bears significant risk and management responsibility*" (World Bank Institute 2012, p. 11). In other words, there is significant risk transfer, entailing that the contracts should seek to clarify risk allocations as much as reasonably possible, so as to minimise subsequent disputes over which contractual parties should fund restitution for unforeseen losses. Public–private partnerships (PPPs) also come in different forms and types within broad DBFO context. For example, they can come in the form of Build-Operate-Transfer (BOT), Build-Own-Operate-Transfer (BOOT), Design-Build-Finance-Operate (DBFO), Design-Build-Finance-Operate-Maintain (DBFOM) and Private Finance Initiatives (PFI) or other forms and variants (see Liu et al. 2018; Wang et al. 2018a). Despite this variation, Wang et al. (2018a) identified key commonalities for all PPPs as follows: (i) durable long term cooperation between the public and private sector (ii) cost, risk,

4

resource, benefit and responsibility sharing (iii) process complexity requiring multi-phased cooperation between the public and private sectors, and (iv) PPP partners must have mutual interests and objectives.

In numerous countries, PPPs have become a critical and vital means of delivering much needed national infrastructure. For example, PPPs have been used as a procurement route to deliver solid waste projects (Kleiss and Imura 2006), schools estates (O'Shea et al. 2019; Dharmapuri Tirumala et al. 2021) and hospitals estates (Hellowell 2013; Top and Sungur 2019).

Aside from steady growth in the number and/or size of projects procured using PPP in developed countries such as the United States (Garvin 2010; Casady et al. 2018), United Kingdom (Carrillo et al. 2008), New Zealand (Sheng et al. 2020) and Denmark (Greve et al. 2021), the he growing popularity of PPP also clearly extends to encompass numerous developing countries (Ismail, 2013; Robert et al. 2014; Osei-Kyei et al. 2017; Wang et al. 2019). The same applies to Saudi Arabia, (Biygautane et al. 2016) especially healthcare (Al-Hanawi et al. 2018, 2019, 2020; Almalki and Al-Hanawi 2018) and transportation sectors (Al-Muawi et al. 2021). Putting this into perspective, according to the World Bank (2021a), the total amount of investment in PPP projects in developing countries stood at around US$ 1,958,777 billion in 2017.

The literature has traditionally taken the position that growth in PPP reflects its numerous advantages. Not least, and as mentioned earlier, in the short term it increases budgetary and spending flexibility for the public sector, especially as it is not required to make any substantial financial outlay to initiate a project. Another advantage comes from its emphasis on the fair sharing and apportionment of risks between the public and private sector (Rybnicek et al. 2020; Verweij et al. 2020). Other attributes of PPP include increased opportunities for closer collaboration between the public and private sectors (Barlow and Köberle-Gaiser 2009; Cui et al. 2019). In particular, it is often argued that such closer collaboration creates substantial opportunities for cross-learning between public and private sectors. However, despite its acknowledged popularity, public sectors within developing countries have been, on the whole, less able to attract private sector participation and/or investment PPP projects (Wang et al. 2019), thus begging questions about whether political and economic volatilities within developing countries may help explain this.. This

circumstance has unfortunately meant that a number of developing countries have been unable to sufficiently profit from PPP. In fact, it appears that in developing countries, numerous projects procured using PPP have been unsuccessful (Adama 2018; Park et al. 2018; Budayan 2019; Chang et al. 2019; Kim and Kwa 2020; Nguyen et al. 2020).

Numerous risks help explain why. Some were elaborated upon in great detail by the United Kingdom Parliament in a 2018 report (see House of Common 2018). One such risk is overpayment for risk transfers to the private sector, reflecting large uncertainty premiums associable with risk unpredictability over long contract durations. This meant that. overall, projects procured using PPP in the UK have often ended up costing more than if a comparable project were to be directly procured/financed by the public sector (National Audit Office 2018). In sum, the literature largely acknowledges that PPP projects are susceptible to more and greater risks (compared to traditionally procured projects), in part because of the complex and structured nature of PPP procurement (Yu et al. 2018; Le et al. 2019; Rybnicek et al. 2020; Tallaki and Bracci 2021).

2.2 Project success criteria (PSC) in projects

Recent project management literature on outcome dimensionality acknowledges "…*the inherent contradictions of the success/failure dichotomy*" (Dwivedi et al. 2015; p. 153) which in effect, problematises distinctions drawn between levels of project '*success*' and '*failure*' to justify their separate treatment (see Chipulu et al. 2019). Substantial literature focusing on 'project success' is of particular interest to us. From these studies, we are able to ascertain numerous and differing meanings ascribed to 'project success' (Van der Panne et al. 2003; Shenhar 2004; Ika 2009; Samset 2010; Muller et al. 2012; Savolainen et al. 2012; Turner and Zolin 2012; Mir and Pinnington 2014; Dwivedi et al. 2015; Williams 2016). Shenhar et al. (2002), for example, identifies thirteen different success factors for projects. Samset (2010), on the other hand, identified five key success as: (i) efficiency, (ii) effectiveness, (iii) relevance, (iv) impact and (v) sustainability. Other pertinent studies include Muller et al. (2012), who cites the "*iron triangle plus nine other success criteria*" (p. 78). More recently, Williams (2016) cited seventeen project success factors with four underlying themes. While the project success literature is well developed, it is not without its critics. Chih and Zwikael (2015)

suggest that focusing on project success criteria may inculcate output-centred mentalities among project management practitioners.

2.3 Critical success factors (CSFs)

Critical success factors (CSFs) refer to "…*those few key areas of activity in which favourable results are absolutely necessary for a particular manager to reach his or her own goals*" (Rockart, 1982, p. 4). From a project perspective, CSFs refer to "…*inputs to project management practice which can lead directly or indirectly to project success*" (Alias et al. 2014, p. 61). In effect, they are those "…*independent variables of things we can influence to increase the likelihood of achieving a successful outcome*" (Turner et al. 2010, p. 81).

Reference to CSFs have been extensively addressed within projects commissioned in various disciplines, such as: (i) information systems (Rockart 1982), (ii) financial services (Boynton and Zmud 1984) and (iii) manufacturing industry (Mohr and Spekman 1994; Mahanti and Evans 2012). Likewise, CSFs have been addressed for infrastructure projects (Chan et al. 2010; Shi et al. 2016; Hsueh and Chang 2017), and more specifically for infrastructure construction projects (Hardcastle et al. 2005; Li et al. 2005; Osei-Kyei and Chan 2017a, 2017b; Ahmadabadi and Heravi 2019a).

In PPP literature within the construction space, studies on CSFs have been widely reported (Li et al. 2005a; Zhang 2005c; Chan et al. 2010a; Osei-Kyei and Chan 2015). Although focusing on CSFs alone does not necessarily lead to successful project implementation (Biygautane et al. 2019; Kim and Kwa 2020), most CSF-related studies appear to attempt to identify and rank factors likely to impact upon project success, or, in the case of PPP, the successful use of PPP to procure projects from three different angles: (i) specific country, (ii) particular project and (iii) project life cycle. For example, we show in Table 1 (below), a summary of the various CSFs identified in the literature that are likely to manifest as critical influencers at project implementation stage on projects.

Table 1: CSFs for successful use of PPP as a procurement route at the implementation phase

NO.	CSFs for PPP projects	Source															
		A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P
CSF1	A strong and good private consortium	X	X	X	X		X	X	X	X		X	X		X		X
CSF2	Appropriate risk allocation and risk-sharing	X	X			X	X	X	X	X		X	X		X		X
CSF3	Available financial market	X	X	X			X		X	X			X		X	X	X
CSF4	Available policies and regulations	X	X		X		X	X	X	X	X		X	X	X	X	X
CSF5	Commitment and responsibility of project parties	X				X	X		X	X	X		X				X
CSF6	Good and effective governance structures	X		X			X		X	X		X	X	X		X	X
CSF7	Government guarantees	X	X				X		X	X			X				
CSF8	Innovation in delivering public services		X	X	X			X							X		
CSF9	Open and constant communication among stakeholders			X		X					X				X	X	
CSF10	project performance monitoring															X	X
CSF11	Supportive and understanding community	X	X	X	X		X		X	X			X		X		X
CSF12	Understand and respect the main PPP parties each other's goals					X					X					X	
CSF13	Political stability	X	X	X		X	X	X	X	X			X		X		X
CSF14	Economic stability	X	X				X	X	X	X			X			X	X

A = (Li et al., 2005a), B = (Zhang, 2005c), C = (Jefferies, 2006), D = (Salman, Skibniewski and Basha, 2007), E = (Jacobson and Choi, 2008), F =(Chan et al., 2010a), G = (Dulaimi et al., 2010), H = (Cheung et al., 2012), I = (Ismail, 2013), J = (Tang and Shen, 2013), K = (Liu and Wilkinson, 2015), L = (Chou and Pramudawardhani, 2015), M = (Liu, Love, Smith, Regan and Davis, 2015), N = (Hsueh and Chang, 2017), O = (Osei-Kyei, Chan and Ameyaw, 2017), P = (Nguyen, Likhitruangsilp and Onishi, 2020).

Over the last few years, CSF related studies have included that of Li et al. (2005a) which was UK focused. Meanwhile, Chan et al. (2010a) and Ismail (2013) adapted the questionnaire survey used by (Li et al., 2005a) to carry out similar research in Hong Kong, China and Malaysia. Other studies have included Dixon, Pottinger and Jordan (2005) who found that: (i) budget and meeting specifications, (ii) efficient and cost-effective procurement process, time and (iii) feedback from users, are some of the essential success criteria for PFI projects. Similarly, Zhang (2006a) used a questionnaire survey with international PPP experts to identify five factors driving success for PPP use in projects.

Other studies include that of Jacobson and Choi (2008), and also of Yuan et al. (2009), who through a comprehensive literature review and a 141 questionnaire survey, identified 15 various performance objectives for PPP construction projects. Cheung et al. (2012) found differences in CSF rankings by Chinese and Hong Kong respondents. Mladenovic et al. (2013), through an extensive literature review, as well as through brainstorming with experts, presented a two-layer strategy for assessing performance of PPP construction projects. Liu et al. (2015) identified five main factors for measuring PPP use success.

Perhaps of available studies on PPP use success criteria, one of the most comprehensive studies available is that of Osei-Kyei et al. (2017), who undertook a detailed review of available research between 1990 and 2013. In the process, they identified eight CSFs for successful use of PPP in projects. In Osei-Kyei and Chan (2017a), an empirical examination of similarities and differences between success criteria for PPP use in projects in developing and developed markets suggested that (i) profitability, (ii) meeting output specifications, and (iii) adherence to the budget, were the main CSFs for PPP use in projects within developing economies. By contrast, they found (i) adherence to budget, (ii) adherence to time, and (iii) effective risk management as the main CSFs for PPP project use in developed economies. From these different literatures, we have identified a set of 15 success criteria for PPP use in projects. This information has been presented in Table 2 (below).

It is important to highlight that methods of measuring project success do appear to vary among stakeholder groups. Interestingly, Dixon, Pottinger and Jordan (2005) opine, mirroring the general view taken within project management literature, that project CSFs should rightly vary, both by stakeholder heterogeneity and, similarly, along project lifecycles where key stakeholder mixes continue to vary (Ojiako et al. 2014, 2015; Chipulu et al. 2019).

Table 2: Success criteria for successful use of PPP as a procurement route

NO.	Success criteria for PPP use in projects	Source															
		A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q
PSC1	Adherence to budget															X		
PSC2	Adherence to time									X		X						
PSC3	Effective risk management				X													X
PSC4	Effective technology transfer and innovation														X			
PSC5	Environmental performance	X				X	X											
PSC6	Local economic development						X											
PSC7	Long term relationship and partnership								X				X					
PSC8	Meeting output specifications															X	X	
PSC9	Profitability														X			
PSC10	Reduced litigations and disputes		X				X											
PSC11	Reduced project life cycle cost								X									
PSC12	Reduced public administrative cost				X	X			X									
PSC13	Reduced public and political protests					X												
PSC14	Reliable and quality service operations			X								X		X				
PSC15	Satisfying the need for public facility/service								X									

A = (Chan, Scott and Lam, 2002), B = (Chan and Chan, 2004), C = (Dixon, Pottinger and Jordan, 2005), D = (Li et al., 2005b), E = (Zhang, 2006a), F = (Zhang, 2006b), G = (Jacobson and Choi, 2008), H = (Yuan et al., 2009), I = (Al-Tmeemy, Abdul-Rahman and Harun, 2011), J = (Meng, Zhao and Shen, 2011), K = (Khosravi and Afshari, 2011), L = (Yuan et al., 2012), M = (Ng, Wong and Wong, 2012), N = (Mladenovic et al., 2013), O = (Liyanage and Villalba-Romero, 2015), P = (Lam and Javed, 2015), Q = (Liu, Love, Davis, Smith and Regan, 2015).

3.0 A conceptual model for PPP and hypotheses

For this study, a conceptual model was created (see Figure 1) as follows: (i) the CSFs for PPP use in projects will act as independent variables (Turner et al. 2010; Osei-Kyei and Chan 2017b; Osei-Kyei et al. 2017); (ii) the success criteria for PPP use projects will become dependent variables (Osei-Kyei et al. 2017); (iii) the economic and political factors will operate as moderating variables (Almeile et al. 2020). The framework and associated hypotheses will be described and discussed in the following sections.

Figure 1: Conceptual model
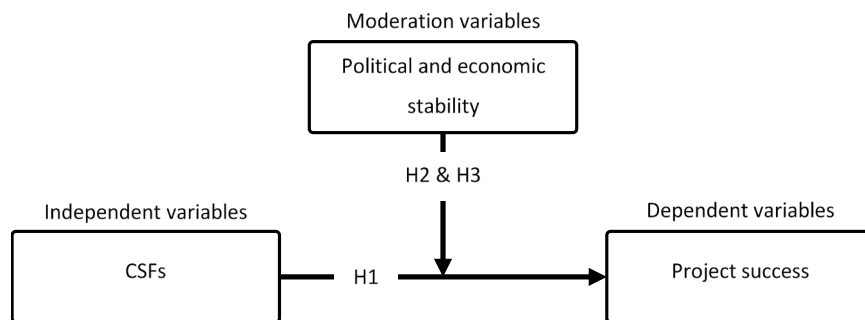
3.1 The relationship between the CSFs and PSC for PPP projects

Although CSFs and PSC are conceptually distinct, but related (Osei-Kyei et al. 2017), both notions have been used interchangeably in some management literature. The subtle differences between the two may be understood as follows. On the one hand, CSFs are intelligible as sets of facts and circumstances promoting project success (Turner et al. 2010; Alias et al. 2014). Varying the conceptual focus, they can also be viewed as 'strengths' driving deliveries of successful project outcomes (Rockart 1982). Looking from either standpoint, it is clear that CSFs are not themselves the successful outcomes. On the other hand, PSC are. These are intelligible as parameters by which success is measured, and as descriptive formulations of successful project outcomes (Chan et al. 2002).

Such nuancing of CSFs against PSC is vital because this facilitates carefully worded focus on the most important factors influencing the project's success – by project management

academics and practitioners alike. Perhaps the key consideration here is that pre-project specifications of CSFs need not always match well to the PSC that stakeholders value at the ends of projects. Thus, for example, Ng, Wong and Wong (2010) used structural equation modelling (SEM) to evaluate directness of relationships between pre-project stakeholder views on project feasibility and later, post-project stakeholder judgments on satisfaction with project outputs. They found that only two out of thirteen CSFs (i.e. social aspects and techniques) were significant contributors to pre-project stakeholder views on feasibility. Ahmadabadi and Heravi (2019b) estimated the direct effects of CSFs during the project procurement phase of PPP construction projects on the success of PPP highway projects in Iran. Using SEM, they found only four out of ten CSFs to be vital to PPP project success. Osei-Kyei and Chan (2019) developed a conceptual model for PPP projects' success in order to then use regression analysis to examine direct relationships between CSFs and success criteria for PPP projects. Their results indicate that only three out of thirteen CSFs were deemed significant contributors to PPP project success.

In the above studies, a clear point of agreement appears to be that only a few CSFs might often prove decisive in influencing PPP project success. Nonetheless, we have not found any studies examining moderating impacts on associations between CSFs and PPP construction project success, especially during project implementation phases. A focus on the implementation phase is particularly important because: (i) it is the last phase in the PPP project life cycle before the end of the concession period, (ii) it is usually the central focus for PPP partners, and (iii) it is the project phase which is likely to entail greatest interaction between the public and private sectors. To this list we can also add and emphasise: (iv) that at this project phase a project is likely to experience the greatest number of CSF impacts (Almeile et al. 2020). The implementation phase is also generally regarded as the project phase at the heart of PPP construction projects (Love et al. 2015; European Investment Bank 2016). In sum, then, project implementation is salient as the phase where project success or failure is most likely to be determined by the vicissitudes of project experience (Yong 2010; European Investment Bank 2016; Liu et al. 2018). Based on these arguments, and informed by previous literature, the following hypothesis is proposed:

H1. The CSFs are positively related to PPP project success in Saudi Arabia.

3.2 Economic and political imperatives

Economic and political conditions are of great importance as influencers of any country's economic output. Political stability helps to establish and then maintain a high level of economic growth and availability of infrastructure resources, while economic stability helps to facilitate the availability of financial resources, and to constantly produce goods and services which will allow the maintenance of manageable levels of internal and external government debts (Turner et al., 2010). When compared to traditional construction projects, PPP projects are very sensitive towards the host nation's economic and political conditions (Liu and Wilkinson 2015; Dewulf and Garvin 2020).

In the past decades, economic and political conditions have created many challenges and precipitated much PPP project failure, especially in developing countries (Budayan 2019; Chang et al. 2019; Kim and Kwa 2020; Nguyen et al. 2020). Of course, political and economic instability will tend to merge, with complex causation running bi-directionally between political and economic life. This has become apparent in recent years, for example, in high profile instances of combined political and economic instability in Thailand, Indonesia, and Turkey, where this combination of factors was widely implicated causing the postponing and changing of many PPP construction plans and also in Mexico where many foreign PPP construction contracts were cancelled.

Such economically and/or political conditions clearly warrant managerial categorisation as risk factors not only at project level, but also on broader strategic levels, in terms of their impacts on the competitiveness of all public and private entities engaged in PPP (see Chang et al. 2019). Furthermore, challenging economic and political conditions can have implications for prospective PPP participant risk appetite, leading to cancellations, delays and deteriorations of contractual terms offered (Ling and Hoang 2010; Kim and Kwa 2020).

Unfortunately, being of a fundamental nature (i.e. affecting entire societies) and outside the control of the private sector (Turner et al. 2010; Dewulf and Garvin 2020; Kim and Kwa 2020), such factors can be underplayed in private sector representations of project risk (Tam 1999), especially where private sector firms/entities lack significant PPP experience. More specifically, despite a paucity of empirical studies examining how economic and political conditions moderate or in fact, inform the association between CSFs and PPP projects' success

rates, we would expect in the light of our foregoing general discussion that economic and political imperatives are highly likely to moderate successful use of PPP (in effect, the success of PPP procured projects). Of course, we would further expect that sometimes economic factors, and at other times, political factors, will be more salient amidst some likely complex interdependence of the two. Thus, the following simplifying hypotheses are proposed:

H2. Political stability moderates the relationship between CSFs and PPP construction projects' success in Saudi Arabia.

H3. Economic stability moderates the relationship between CSFs and PPP construction projects' success in Saudi Arabia.

4.0 Methodology

To address the research question ('*RQ*'), a questionnaire survey was employed to gather the data from organisations within Saudi Arabia involved in PPP projects. In addition, Structural Equation Modelling (SEM) analysis was undertaken to test the above hypotheses ('*H1*', '*H2*' and '*H3*'). Figure 2 (below) provides a diagrammatical representation of the overall study approach, adapted from an earlier similar study by Ojiako et al. (2022).

Figure 2: Diagrammatical representation of research approach
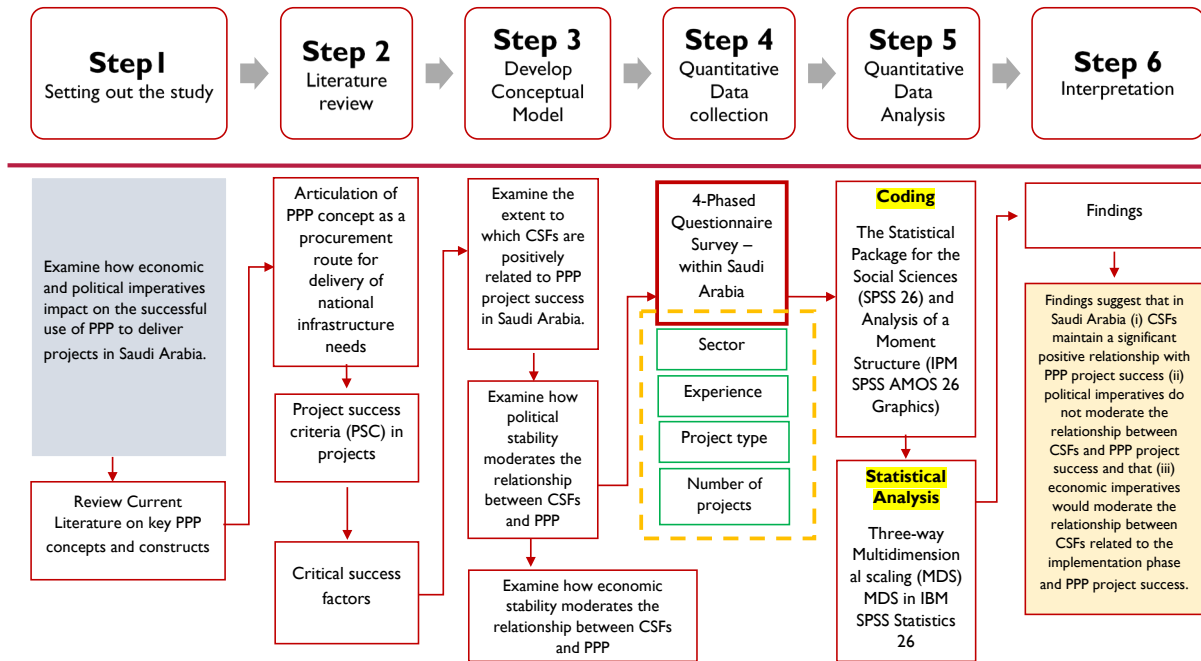
4.1 Questionnaire survey

The data used in this test were collected through questionnaire because it has been found highly appropriate for SEM studies (Ershadi et al. 2019; Osei-Kyei and Chan 2019). The complete questionnaire consists of four sections and totals 33 questions. The first section deals with the participants' experience of PPP project implementation in Saudi Arabia, focusing on factors such as: (i) the sector, (ii) years of experience, (iii) types of projects and (iv) the number of projects involved. The remaining sections focus on participants' opinions regarding the levels of the CSFs, pertinent economic and political conditions, and the implementation success of PPP projects in Saudi Arabia. The respondents' opinions were measured by five-point Likert (1932)-scale, coded as 1 = 'Strongly disagree' through to 5 = 'Strongly agree'.

Prior to disseminating the questionnaire, a pilot study was undertaken with a small group of academics and project management practitioners, again with substantial PPP experience.

Of the academic group, all had published in peer reviewed journals, papers on the topic of interest (Public-private partnership). They were therefore very conversant with applicable PPP assessment measures. Of the practitioner group, all had verifiable experience as project

management practitioners whose statuses could be deemed equivalent to that of either a Chartered Project Professional (ChPP) or a Chartered Engineer (CEng). All the selected practitioners were also currently serving as project management practitioners in Saudi Arabia. The choice of such a group was critical to our study as we deemed it important to draw upon the expertise of a group possessing sufficient appreciation of the literature, balanced with practical experience, as to enable their critical evaluation of the face validity of PPP factors derived from literature. Although as in the case of Al-Hanshi et al. (2022), our study was undertaken in the gulf region where the official language is Arabic, our study was not focused on any particular influences of national culture (e.g. see Chipulu et al. 2014). We recognise, nonetheless, that such influences have been found to exist in PPP settings (see Prybil et al. 2015). Accordingly, we would opine that it does make good sense for research similar to our own to focus on political and economic factors within particular contexts of national culture. However, that was not our present focus.

Unlike Al-Hanshi et al. (2022) who conducted their study within the Sultanate of Oman and the United Arab Emirates in English, we conducted our survey in Saudi Arabia in Arabic, because in Saudi Arabia (as compared with the Sultanate of Oman and the United Arab Emirates), English is not an unofficial business language. Also, in conducting the survey in Arabic, we avoided possible mistranslations (Douglas and Craig 2007). Taking into consideration likely sensitivity of the research topic, anonymity was considered extremely important. Thus, demographic details or questions that might strip away the veil of respondent anonymity (e.g. name, position, contact and gender) were excluded (van den Hoonaard 2003).

No standard database of organisations involved in PPP projects is maintained in Saudi Arabia. Besides, use of PPP as a procurement approach is still developing in that country. As a result, the use of convenience as against random sampling was deemed more appropriate despite its limitations (such as the absence of generalizability – see Brewis 2014). More specifically, to use random sampling would: (i) have made demands that the population of organisations engaged in PPP were known and (ii) that the number of participants would be large (Hair et al., 2010; Fellows and Liu, 2015). Hence we opted for convenience sampling. A total of 300 questionnaires were printed and distributed by hand in December 2019 among Saudi-based organisations known to be involved in PPP projects in the country. We chose

organisations engaged in infrastructure/construction related PPP projects in particular. More specific still, we targeted organisations involved with the three out of seven sectors of the national economy deemed most important by the Saudi government to achieve the objectives of Saudi Vision 2030: (i) Energy, (ii) Social Development and (iii) Transportation. After several follow-ups, 271 questionnaires were returned; 14 of these were spoilt, leaving a total of 257 questionnaires for analysis.

4.2 Coding

Following the data collection, the qualifying responses were coded for electronic processing. The Statistical Package for the Social Sciences (SPSS 26) and Analysis of a Moment Structure (IPM SPSS AMOS 26 Graphics) were used to analyse and test the data. Despite debate over optimal sample size for SEM analysis, there has been as yet no agreement, due to its complexity. Researchers have proposed a range of different criteria: (i) at least five cases per parameter (Bentler and Chou 1987), (ii) a minimum sample size of 200 (Weston and Gore, 2006; Kline, 2015) or (iii) a range of 150 to 400 cases (Hair et al., 2010). Hence it is reasonable to assume that this research's sample (N=257) is sufficient to support a stable SEM.

4.3 Respondents characteristics

Table 3 shows the respondents' characteristics by sector, project category, years of experience, number of PPP projects and sample size. The results show that the focus of this research was on those who have experience of implementing PPP project in Saudi Arabia from both public sector organisations (67%) and private sector institutions (33%), as well as those having experience with social development projects (32%), transportation projects (27%) and energy projects (41%). The respondents' years of experience in PPP projects were: (i) between 1 to 5 years (21%); (ii) between 6 to 10 years (25%); (iii) between 11 to 15 years (27%) and (iv) 16 years or more (27%). The range of projects the respondents worked on in the KSA was as follows: one project (1%); two projects (20%); three projects (14%); four projects (11%); five projects or more (53%). All respondents who had 1 to 5 years or more experience, with at least two PPP construction projects, were considered essential for this research. In addition, all respondents who operated one project or more, with at least six years of experience in implementing PPP projects, were selected.

Table 3: Characteristics of respondents

Participant experience in PPP project		Frequency	Per cent	Cumulative per cent
Sector type	Public sector	173	67%	100%
	Private sector	84	33%	
Project category	Social development projects	82	32%	100%
	Transportation projects	69	27%	
	Energy projects	106	41%	
Years of experience	5 years or less	54	21%	100%
	6 to 10 years	63	25%	
	11 to 15 years	70	27%	
	16 years or more	70	27%	
Number of projects	Zero project	0	0%	100%
	One project	3	1%	
	Two projects	52	20%	
	Three projects	36	14%	
	Four projects	29	11%	
	Five projects or more	137	53%	

The descriptive analysis of the respondents shows that the sample for this research is well represented by sector type, project category, years of experience, number of projects and sample size, relative to what can be claimed for most of the earlier mentioned PPP success research cited earlier in the present study.

5.0 Analysis and findings

5.1 Overview

A hypothesised model containing 12 items that specify CSFs related to the implementation phase, together with 15 items which construct the project success for the PPP project, and a further two items which present the political and economic variables, was developed. This hypothesised model, composed of items, was developed to test the influences of the CSFs on the PPP projects' degrees of success, as well as to test the impacts of the economic and political imperatives on the associations between the CSFs and project success.

The political and economic variable data was statistically analysed to identify perceived levels of stability in Saudi Arabia. In Table 4 below it can be seen that 67.7% of respondents

declare that political conditions were significant while 64.59% of respondents indicated high significance for economic conditions. Notably, the respondents who deemed political and economic factors most salient as influencers tended to be those with the most years of senior-level experience (see Table 4).

Table 4: Economic and Political imperatives based on respondent's years of experience

Variables	Stability	Years of experience	Per cent	Cumulative per cent	Total
Political	Low stability	5 years or less	7.78%	32.30%	100%
		6 to 10 years	8.17%		
		11 to 15 years	6.61%		
		16 years or more	9.73%		
	High stability	5 years or less	13.23%	67.70%	
		6 to 10 years	16.34%		
		11 to 15 years	20.62%		
		16 years or more	17.51%		
Economic	Low stability	5 years or less	8.95%	35.41%	100%
		6 to 10 years	7.78%		
		11 to 15 years	8.17%		
		16 years or more	10.51%		
	High stability	5 years or less	12.06%	64.59%	
		6 to 10 years	16.73%		
		11 to 15 years	19.07%		
		16 years or more	16.73%		

The same respondents also had more experience with PPP projects in general (Table 5) in comparison with the rest of the respondents.

Table 5: Economic and Political factors based on respondents' experience with PPP projects

Variables	Stability	Number of projects	Per cent	Cumulative per cent	Total
Political	Low stability	One project	0.78%	32.30%	100%
		Two projects	7.39%		
		Three projects	3.89%		
		Four projects	4.28%		
		Five projects or more	15.95%		
	High stability	One project	0.39%	67.70%	
		Two projects	12.84%		

		Three projects	10.12%		
		Four projects	7.00%		
		Five projects or more	37.35%		
Economic	Low stability	One project	0.78%	35.41%	100%
		Two projects	8.17%		
		Three projects	4.28%		
		Four projects	4.28%		
		Five projects or more	17.90%		
	High stability	One project	0.39%	64.59%	
		Two projects	12.06%		
		Three projects	9.73%		
		Four projects	7.00%		
		Five projects or more	35.41%		

5.2 Analysis

All the data was processed to reduce any problems for the later main analysis including: (i) missing values, (ii) standard deviation, (iii) outliers, (iv) median, (v) mean, (vi) skewness and (vii) kurtosis (Tabachnick and Fidell 2007; Hair et al. 2010). Fourteen cases were spoilt due to missing data in rows, unengaged responses and outliers. Moreover, nine cases were adjusted due to missing data in some columns. The median index of nearby points was used for Likert scale variables, while the mean index was used with continuous variables (Landau and Everitt 2004; Field 2013; Hinton et al. 2014). Thereafter, the levels of skewness and kurtosis were tested, yielding readings within the stipulated range: (i) skewness -0.04 to -0.08, and (ii) kurtosis 1.06 to -1.63. We reasoned that through such processing, confidence in the survey data contribution increases (Schumacker and Lomax 2010; Kline 2015). Two later steps, using a measurement model and a structural model, were also conducted to analyse the data and test the hypotheses based on the SEM (Hair et al. 2010; Schumacker and Lomax 2010; Byrne 2016).

5.2.1 Measurement model

The first step, involving CFA, tested: (i) reliability, (ii) validity, (iii) invariance and (iv) common method bias (CMB) for the proposed measurement model. Multivariate assumptions were also tested.

Reliability was tested using Cronbach's alpha. Any values below 0.6 are often regarded as indicating poor reliability (Nunnally 1978; Hair et al. 2011). The value of Cronbach's alpha

in this research ranged from 0.83 to 0.88. indicating that findings for all variables were acceptably reliable (see Table 6).

In terms of *Validity,* convergent and discriminant validity levels were tested. Convergent validity occurs when each measurement item has a high correlation with its particular theoretical constructs. Three main criteria have been proposed by researchers for assessing convergence validity: (i) factor loadings; (ii) composite reliability (CR) and (iii) average variance extracted (AVE) (Fornell and Larcker 1981; Hair et al. 2010). All items with standardised regression weights below 0.6 and/or with factor loadings below 0.4 were excluded to improve model fit (Hair et al. 2010). The CR values represent the range to which the construct indicators identify the latent construct, which we opted to test Heeding previous research proposing that CR coefficients should not be below 0.70 (Bagozzi and Yi 1988; Hair et al. 2011), all constructs in this research were found to have CR values ranging from 0.75 to 0.81 (see Table 6). AVE values are commonly required to equal or exceed 0.50 to guarantee practical significance and ensure that the explained variance is higher than the variance caused by measurement error (Hair et al. 2011). The AVE in this research ranged from 0.50 to 0.52 (see Table 6).

Table 6: Convergent Validity

Constructs / items	Factor loading	Cronbach's alpha	Composite reliability (CR)	AVE
CSFs		0.83	0.75	0.50
CSF2	0.73			
CSF4	0.67			
CSF12	0.71			
PSC		0.88	0.81	0.52
PSC1	0.76			
PSC2	0.77			
PSC8	0.65			
PSC14	0.71			

Table 6 illustrates that all remaining factors passed the recommended values: indicator loadings passed 0.4, composite reliability held above 0.7, and the AVE scores were 0.5 and over (Chin 1998; Hair et al. 2010).

Discriminant validity is where each measurement factor has a low correlation with all the other constructs, except theoretically linked constructs. This is testable by the square root of the AVE (Fornell and Larcker 1981). Table 7 shows how this was used to equate the correlations between the latent constructs. All the square roots of the AVEs were higher than the correlations between the latent constructs. The absence of any correlations between constructs exceeding the square root of the AVE confirms discriminant validity for all constructs in this research.

Table 7: Discriminant Validity

Constructs	CSF	PSC
CSFs	**0.706**	
PSC	0.808	**0.723**

Invariance was also tested. A multi-group (i.e., political low stability, political high imperatives, economic low imperatives, and economic high imperatives) was constructed to test the *configural* and metric invariance through two models. First, the *configural* invariance was tested by using model *A*. Through unconstrained parameters, a goodness model fit was obtained when analysing a freely estimated model across the created groups with X^2 = 23.07; *df* = 13; X^2/df = 1.775; RMR = 0.026; GFI = 0.974; CFI = 0.984; RMSEA = 0.055; PCLOSE = 0.37; SRMR = 0.0308 (see Table 9). Second, metric invariance was tested using model *B*. Through constraining the two models to be equal, and by conducting a high score difference test between the fully constrained and unconstrained models, an invariant p-value = 0.933 was realised (Milfont and Fischer 2010; Kline 2015).

Common method bias (CMB) was also tested using a single latent factor and common latent variance. The findings show all values below 50%, indicating no significant bias and that CMB is therefore not present in this research (Schumacker and Lomax 2010; Byrne 2016).

Multivariate assumptions were also examined (see Table 8). First, Cook's distance analysis was tested to ascertain whether any influential outliers negatively affect the regression model. All Cook's distance readings were below 0.8 (see Figure 3), indicating their acceptability as per common usage of the Cook's distance test (Cook 1977; Aguinis et al. 2013).

Figure 3: Cook's distance analysis
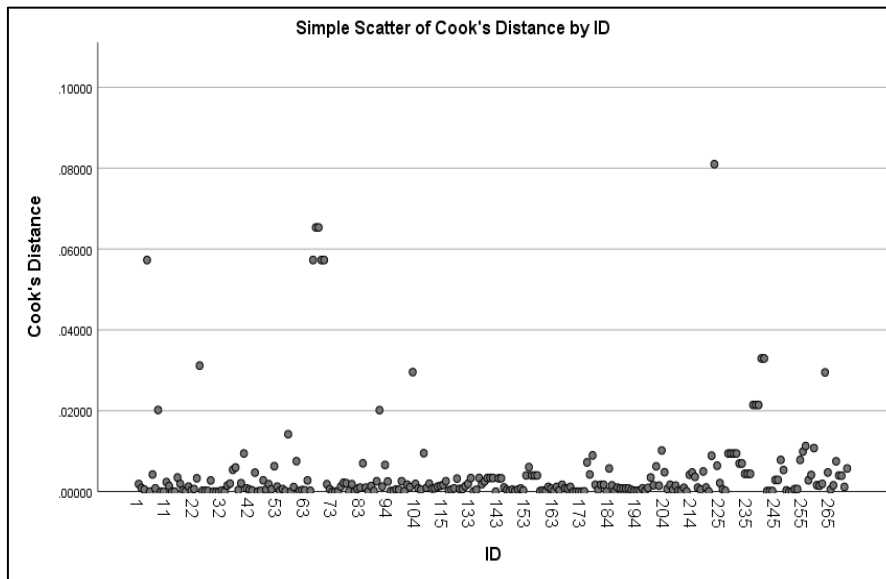
After the normality of the data in the regression model was verified, the *multicollinearity* analysis was conducted to determine similarities between the independent variables. The variance inflation factor (VIF) indices for the regression model were in the stipulated range (see Table 8). VIF is between 1.179 to 2.179, with tolerance between 0.848 to 0.459. This eliminates the possibility of *multicollinearity* concerns (Landau and Everitt 2004; Hair et al. 2010; Schumacker and Lomax 2010).

Table 8: Multivariate assumptions

Multivariate indicators	Recommended values	Source
Cook's distance	< 1	(Cook, 1977; Aguinis, Gottfredson and Joo, 2013)
VIF	VIF < 3	(Landau and Everitt, 2004; Hair et al., 2010;
Tolerance	Tolerance > 0.1	Schumacker and Lomax, 2010)

The final *Measurement model fit* (see Table 9) suggests an acceptable fit of the proposed model X^2 = 23.07; *df* = 13; X^2/df = 1.775; RMR = 0.026; GFI = 0.974; CFI = 0.984; RMSEA = 0.055; PCLOSE = 0.37; SRMR = 0.0308 (Tabachnick and Fidell 2007; Hooper et al. 2008; Hair et al. 2010; Kline 2015; Byrne 2016). Overall, the final measurement model (CFA) comprised seven items describing two latent constructs and two moderating variables.

5.2.2 The Structural Equation Modelling (SEM)

Structural Equation Modelling (SEM) is a "...*statistical methodology that takes a confirmatory (i.e., hypothesis-testing) approach to the analysis of a structural theory bearing on some phenomenon*" (Byrne, 2016, p. 3). It can use different types of model to describe "...*relationships among observed variables, with the same basic goal of providing a quantitative test of a theoretical model hypothesised by the researcher*" (Schumacker and Lomax 2010, p. 2). In other words, the SEM is a powerful statistical tool to test various theoretical models that hypothesise how groups of variables define combinations and how these combinations relate to each other (Gorsuch, 1990; Molenaar et al. 2000).

Structural Equation Modelling (SEM) has two types of variables (i) measured items and (ii) latent variables. Whereas the measured items can be observed and directly measured, the latent variables are theoretical and/or hypothetical constructs, which are deducible from the measured items. Since a Structural Equation Model can hold a very complicated series of structural (regression) equations between different elements, path diagrams are generally prepared to illustrate these relationships, thus providing a clearer visualisation of the theory under study. In the path diagrams, the measured items are represented in rectangles, while the latent variables are represented in ovals. One-direction and two-direction arrows are usually used to connect the elements and represent the causal flows of relationships. The one-direction arrow indicates the regressive relationships, with the direction of the arrow implying the direction of influence. The two-direction arrow indicates the inter-correlation between variables. Structural Equation Modelling (SEM) combines: (i) a measurement model and (ii) a structural model in a single statistical test (Schumacker and Lomax 2010; Byrne 2016). The measurement model (confirmatory factor analysis CFA) is concerned with: (i) how the set of items will measure the latent constructs and (ii) addressing the model's validity and reliability.

The structural model (regression or path analysis) is concerned with modelling the association between the different latent constructs by illustrating the amount of interpreted and un-interpreted variance, which is similar to the system of simultaneous regression models. All the items and the latent variables were used in the structural model to establish the relationships between the items through the regression path analysis and the latent variables in the structural model. The latent variables and their corresponding items were

correlated by one-direction arrows to describe the orientation of hypothesised influences (Kline 2015; Byrne 2016). Thereafter, the relationships between the different variables can be tested. We now examine the moderating effects.

A *Moderator* is known as the third variable "...*that affects the direction and/or strength of the relation between an independent or predictor variable and a dependent or criterion variable*" (Baron and Kenny, 1986, p. 1174). Based on the definition of a moderator, the moderating effect can easily be added and measured, depending on the value of the other independent variable (Wu and Zumbo 2008; Henseler and Fassott 2010).

In Structural Equation Modelling (SEM), the moderating effects mean a moderated relationship within the structural model (Henseler and Fassott 2010). In this study, the author(s) were interested in the moderating effects of economic and political imperatives on the direct relationships between the CSFs as an independent variable and the project success as a dependent variable.

In order to examine the hypothesised moderating effects, this research followed the steps for investigating moderators as suggested by Chin et al. (2003) and Henseler and Fassott (2010). The same procedure for examining moderating effects has been adopted by many researchers (see Adeleke et al. 2018a, 2018b; Bamgbade et al. 2018).

Firstly, the latent variables must be standardised by calculating the Z-score. Secondly, direct effects should be examined. This step can be achieved by integrating the entire exogenous latent (i.e., CSFs) variable and considering the moderating variables (i.e., economic and political imperatives) as other independent latent variables in the model. Thirdly, comes creating the interaction term; a step which can be accomplished by multiplying the indicator of the exogenous variable (i.e., CSFs) by each indicator of the moderators (i.e., economics and politics). Finally, the degrees of the latent variable are entered as independent and dependent variables based on their position in the path model (Chin, Marcolin and Newsted 2003; Henseler and Fassott 2010). After completing the steps mentioned above, checks were made to ensure the model fits the acceptable limits. The results showed that all the indicators remained within the suggested acceptable limits; X^2 = 53.2; *df* = 33; X^2/df = 1.611; RMR = 0.024; GFI = 0.964; CFI = 0.976; RMSEA = 0.049; PCLOSE = 0.503; SRMR = 0.034 (see Table 9).

Table 9: Goodness of fit measures

Goodness of fit indicators	Recommended values	Source	Sample (n = 257)		
			Measurement model		Moderating effect
			Invariance	CFA	
X^2	> 0.5	(Hooper, Coughlan and Mullen, 2008; Kline, 2015)	123.5	23.07	53.2
df	-	-	65	13	33
X^2/df	< 3	(Tabachnick and Fidell, 2007)	1.9	1.775	1.611
RMR	Good models have small RMR	(Tabachnick and Fidell, 2007; Kline, 2015)	0.041	0.026	0.024
GFI	≥ 0.95	(Hair et al., 2010)	0.956	0.974	0.964
CFI	≥ 0.95	(Hair et al., 2010)	0.966	0.984	0.976
RMSEA	≤ 0.08	(Hair et al., 2010)	0.034	0.055	0.049
PCLOSE	≥ 0.00	(Byrne, 2016)	0.998	0.37	0.503
SRMR	≤ 0.08	(Hair et al., 2010)	0.0653	0.0308	0.034

5.2.2 The SEM findings

After reaching appropriate measurements, the hypotheses were tested via a two-tailed regression path (Tabachnick and Fidell 2007; Schumacker and Lomax 2010). Initially, the relationship between the CSFs related to the implementation phase and PSC for PPP projects was examined. It was hypothesised that the CSFs would be positively related to PPP project success in Saudi Arabia. Results affirmed that CSFs do indeed have a significant positive relationship (β = 0.808, $p < 0.001$). Hence, hypothesis 1 was strongly supported. We next examined economic and political impacts on the relationship between the CSFs and PSC for PPP projects. Hypothesis 2 proposed that political influences would moderate the relationship between CSFs and PPP project success in Saudi Arabia. However, results disc showed not direct effects (β = 0.139, $p < 0.01$) or interaction effects (β = 0.038, $p = 0.500$) on this relationship. Therefore, hypothesis 2 was not supported. By contrast, hypothesis 3, proposing that economic influences would moderate the same relationship, was proven. Results reveal economic influences as moderating and strengthening the positive relationship between CSFs and PPP project success, both through direct effects (β = 0.128, $p < 0.05$) and interaction effects (β = 0.147, $p < 0.01$).

6.0 Discussions

Testing of the three hypotheses shows that: (i) CSFs maintained a significant positive relationship with PPP project success in Saudi Arabia, (ii) political imperatives do *not* moderate the relationship between CSFs and PPP project success in Saudi Arabia and (iii) economic imperatives do appear to moderate that same relationship. Our finding on political imperatives is very notably inconsistent with prior studies which have reported these as major challenges and sources of PPP failure in developing countries (Salman et al. 2007; Chan et al. 2010a; Dulaimi et al. 2010; Boudet et al. 2011; Cheung et al. 2012; Ismail 2013; Lee and Schaufelberger 2014; Robert et al. 2014; Biygautane et al. 2016; Biygautane 2017). A possible reason for this divergence could be the lack of control variables as relates to the size of organisations that participated in the current study. Our findings on economic imperatives are however in line with prior studies, confirming that PPP projects as being, generally speaking, very sensitive to the host nation's economic climate (Butkiewicz and Yanikkaya 2005; Alon and Herbert 2009; Chang et al. 2019).

These findings are perhaps best examined from a project risk management perspective focused on making general provision for fundamental political and economic risk, recognising especially linked needs for reputational, asset and profit protection by minimizing likelihoods and impacts of losses traceable to fundamental political or economic causes (Marshall et al. 2019). Recently, many PPP construction projects in developing countries, including those in the gulf region (e.g. in Saudi Arabia) have failed to meet their PPP aspirations because of poor risk management in particular (Alotaibi 2016). Looking from a risk perspective, and calling attention especially to perceived impacts of economic imperatives on PPP project success in Saudi Arabia, our study suggests that projects procured using PPP warrant a careful project risk management focus on possible risk events such as restrictions or caps on amounts of private sector investment in PPP projects, or restrictions on foreign-ownership or participation in PPP projects, or indeed risks associated with lack of transparency in banking or other financial regulations. Then, of course, there are further economic risks associated with regulatory practice itself and the overall regulatory burden. Other examples of economic risks may relate to non-transparent PPP tendering processes (where there may be some arbitrariness in terms of monetary control), unrealistic long term financial investment pledges, payment defaults by governments, and constant changes of key personnel (Sachs et al. 2007).

The above list illustrates the broad range of risks traceable back to fundamental economic factors that might impact long term viability of PPP projects, and which private sector partners are more directly exposed to. In calling attention to the general importance of this broad risk category, it is hoped that the present findings will remind PPP practitioners in both the public and private sectors to very carefully explore this broad risk category in advance, such that better controls can be created and more realistic risk transfer premiums can be negotiated.

By the same token, our findings lead us to urge practitioners to reflect more carefully on political factors by considering especially that sometimes they may be less serious than is widely presumed. To emphasise this point, this recommendation is very different to urging neglect of said factors. In effect, the present study found PPP projects in Saudi Arabia less likely to experience specific instrumental actions as boycotts by individuals and groups (see Chipulu et al. 2016a,2018). Such boycotts have often occurred in PPP projects in other national-political contexts. For example, boycotts were organised by airport employee unions at Udaipur and Jaipur airports in India in December 2018, protesting against a decision of the Indian government to manage the two airports utilising PPP. Furthermore, in finding that political imperatives do *not* moderate the relationship between CSFs and PPP project success in Saudi Arabia, our findings suggest that such governmental practices as restrictions on the use of foreign currencies, or on the artificial setting of home/national currency exchange rates for government transactions, or indeed various other problematic public policy issues (AlRaeesi and Ojiako 2021) are less likely to manifest and become material to PPP project success. This finding is particularly significant as the private sector is rarely able to insulate itself against such risk factors, and, arguably, it behoves all governments to work to optimise political stability so as to create more favourable conditions for PPP success, thereby enlarging their set of public procurement options and creating more value for their tax payers and broader citizenry. Accordingly, we find the KSA government to be successful in this regard.

7.0 Conclusions

7.1 Application

Infrastructure projects are generally construed not only as complex (making them difficult to successfully deliver), but also politically and economically contentious (Casady et al. 2020).

Due to the scale of financial investment governments need to make in such projects, governments are increasingly seeking to meet or supplement their public sector investment needs by inviting private sector participation using public-private partnerships (PPPs) as the key financial mechanism (Hussain and Siemiatycki 2018; Liu et al. 2018; Singla et al. 2021). More specifically, PPP serves to create the conditions allowing for long term contractual arrangements to be set in place between the government (acting on behalf of the public) and private sector partners. Thus, PPP stands out amongst other public procurement options as setting out to not only increase private sector participation in public sector infrastructure delivery, but also to increase the potential for risk to be shared via principles of fair, efficient and transparent allocation between the public and private sector (Akinyemi et al. 2009; Carbonara et al. 2014; Wang et al. 2018b). In addition to providing access to additional funding sources, the literature highlights that PPP offers the public sector numerous benefits, such as being able to access private sector expertise in areas such as project delivery and monitoring, risk allocation and management and innovation (Ismail and Azzahra Haris 2014; Ameyaw et al. 2017). Thus, PPP serves the ancillary role of enhancing how the government manages the provision of infrastructure through its ability to: (i) minimize the restrictions faced by the public sector when negotiating complex infrastructure contracts, (ii) inject much needed flexibility and competition in the provision of public sector infrastructure and (iii) provide the public sector with much needed access to private sector financial and technical expertise, knowledge and resources (Osborne 2006; McQuaid and Scherrer 2010; Yang et al. 2013). PPP also stimulates innovation in public sector infrastructure development (Verweij et al. 2020).

Despite such widely reported advantages, the literature also highlights that numerous factors can prevent successful use of PPP in project delivery. This means that various benefits deemed accruable from PPP may not necessarily emerge. Among these problems are economic and/or political factors (Aladağ and Işik 2020; Kim and Kwa 2020). Unfortunately, the manifestation of these factors appears to have been more noticeable in developing countries as against developed ones as it is in developing countries that political and economic volatility tends to concentrate more and have more severe impacts (Lee and Schaufelberger 2014; Robert et al. 2014). Scholars suggest that PPP success may be highly

susceptible to political and economic stability (Liu and Wilkinson 2015; Dewulf and Garvin 2020).

Driven by these considerations within the literature, the main aim of this study was therefore to examine how economic and political imperatives, as experienced by project practitioners themselves, have impacted on successful use of PPP to deliver projects. The national context of the study was Saudi Arabia, a country which has recently begun to aggressively pursue new fiscal management policies framed predominantly within the PPP space. In sum, our findings suggest that within this Saudi context (i) CSFs did have significant positive relationship on PPP project success, that (ii) political imperatives did not significantly moderate the relationship between CSFs and PPP project success, but that (iii) economic imperatives moderated and strengthened the positive relationship between CSFs and PPP project success. We have called attention to the importance of evaluating these findings not just from the project risk management standpoint but also from the standpoint of what governments can do to create more favourable environments for PPP approaches to public procurement. We think the two concerns are connected. Governments can usefully monitor project risk management experiences, focused on the broad political and economic risk categories and, in turn, project risk management practitioners on PPP projects can usefully monitor for what governments do to improve prospects for successful PPP use.

7.2 Theoretical contributions

In terms of theoretical contributions, the study responds directly to historical calls for increased and much more broaden empirical studies in both operations (Flynn et al. 1990; Filippini 1997; Scudder and Hill 1998; Gupta et al. 2006; Fisher 2007) and project management (Padalkar and Gopinath 2016). These calls have been driven by a recognition that empirical studies play a major role in knowledge creation. This point has recently been reiterated by Roth and Rosenzweig (2020). Second, our study contributed to discussions within PPP literature by highlighting the importance of economic relative to political imperatives as key determining factors for PPP success. Third, our findings on the intersect between economic and political imperatives and success of PPP projects represent constitute knowledge that is actionable within project risk management for PPP projects, both pre and post contract inception (see Bresnen et al. 2004; Sydow et al. 2004; Al-Mazrouie et al. 2021).

More specifically, our proposition is that the findings that emerge from the study can serve as classifiers for the identification of risk in projects procured using PPP. However, it is important to emphasise that the emergent ontology of risk should not be construed as primarily suggesting that there are two distinct streams of risk in PPP projects (one focused on economic imperatives and the other, focused on political imperatives), of which associated knowledge of risk may be separately produced. Instead, we recognise complex interdependency and therefore urge more careful consideration of interfaces between political and economic risk categories, especially in terms of the causal mechanisms that run between them. In effect, then, one of our main theoretical contributions is to suggest that focusing on risk likely to derail the successful utilisation of PPP to delivery projects (primarily, construction) in Saudi Arabia, requires a holistic and causal perspective on risk and risk knowledge production among PPP project practitioners – one where risk factors arising from changing economic conditions weigh more heavily on the risk management mind than do those arising from changing political conditions.

Our study also extends how PPP is understood within operations management scholarship. So far, there has been a paucity in empirical research conducted in this area, thus PPP research, especially for operations management in the gulf region, is at a formative stage. As specifically relating to Saudi Arabia, developing an understanding of PPP is particularly vital for two main reasons. The first is Saudi Arabia's economic dominance of the gulf region. For example, the country's economy is among the top twenty in the world (International Monetary Fund 2021). The second relates to project NEOM. The concept, an essential part of Saudi Vision 2030, entails the Saudi government being able to attract more partnerships with the private sector. One such example is a recent partnership (announced 1st December 2020), between NEOM and Volocopter, a pioneering firm involved in personal electric multirotor air vehicles. The joint venture between NEOM and Volocopter sets out to not only design, but also operate electric Vertical Take-Off and Landing (eVTOL) mobility air vehicles that will be fully integrated with NEOM's multi-modal transit ecosystem. Clearly, it is within the purview of government to work to enhance prospects for greater PPP use by exploring the relative importance of economic and political factors that are partly within its discretionary powers of influence, and to then work to optimise these with a concern to reassure prospective

private sector PPP partners that the influences of these factors on PPP success are controllable and likely to be benign.

7.3 Practical contributions

Our study makes contributions to practice. For example, it provides a strategic-level pointer for PPP practitioners on the nature of the precise managerial mechanisms they may need not only to successfully deliver PPP projects, but also ensure that both the public and private sectors are motivated to ensure the success of these projects through equitable risk sharing. To be more specific in our assertions, it is our opinion that despite not significantly moderating the relationship between CSFs and PPP project success, there is a need to focus on political imperatives in PPP projects. The reason is that politics has long been recognised as an inherent factor impacting the outcome of projects (Devlin and Yap 2008; Ponzini 2011; McGivern et al. 2018; Silva 2018) and more specifically, PPP projects (see Carpintero and Siemiatycki 2016). Such political factors may be particularly manifest in PPP projects where the key players, that is the public and private sector, often have and maintain very different and contradicting expectations, objectives and interests. Thus, project management practitioners involved in PPP projects, especially in a developing country context such as Saudi Arabia, need to be particularly alert to these differences. In fact, we contend that in such circumstances, project management practitioners need to demonstrate a level of professionalism, competency and insight in areas relating to the handling of project-related risk information that will allow for the development of holistic risk knowledge pertaining to the relative importance of various risk categories and their likely interactions. Within that context, focusing on interplay between economic and/or political imperatives and facilitating an understanding of how these two factors moderate the relationship between CSFs and PPP project success may serve as a platform for developing a template for effective and efficient PPP success, set within the developing country context especially. More specifically, such a template will allow practitioners to best articulate the nature of specific managerial actions the public sector should focus upon in order to fully exploit PPP as a source of funding, as an avenue for risk allocation, and as a means to acquire more management expertise and innovation. This also allows (when both are construed as mechanisms of information exchange – see Bashir et al. 2022), for greater insight into the interdependence of the two

factors. There may be a need for project managers under such circumstances to constantly configure and reconfigure their management styles in response to the moderating impacts of economic and political imperatives on PPP project success. More often than not, project managers have been known to ignore the impact of project-life subjectivity under dynamic state conditions (Ng et al. 2002). The literature suggests the need for open and flexible project leadership as a means of overcoming such constraints (Turner and Müller 2005; Medina and Francis 2015).

7.4 Limitations and future studies

The study does have limitations which create opportunities for future research. First, our findings on political and economic influence, while being general in character, do have limits on their generalizability. For example, since the sample studied was not selected randomly, it is not necessarily representative of all PPP projects in other countries (especially, developing ones). In effect, the relative homogeneity of the data sample limits generalisation of the findings. However, the configuration of the Saudi economy is closely aligned with that of other gulf countries, with many of the firms sampled in this study either having subsidiaries, affiliates or partners with other entities across the gulf region. This allows the findings of the study to be extended at least as far as the gulf region. Undertaking empirical studies based on a much more heterogeneous selection of PPP industry sectors will be one means of overcoming this limitation. Of course, it may well be that studies of political and economic influence reach radically different conclusions, depending on national context.

Related to that, the second limitation of this study is that while the socio-political and national cultural context of PPP was highlighted, we did not directly analyse either political (see for example, Flinders 2005) or national socio-cultural debates surrounding PPP (see for example, Hodge and Greve 2010; Boyer and Van Slyke 2019). Neither did we highlight the public policy perspective on PPP, despite its critical importance (see AlRaeesi and Ojiako 2021). We also did not take into consideration that differences in PPP forms and types could have an impact on our study objectives. By not laying emphasis on differences between PPP typologies, or that PPP remains a contested concept (Bovaird 2004; Weihe 2008), our study did not take into consideration the possibility that different PPP forms (DBFO etc.) may be more appropriate for either specific tasks or for particular industry sectors (Bovaird 2004).

The third limitation of our study is that we did not explore interrelationships between economic and political imperatives moderating the relationship between CSFs and PPP project success. We highlight both the need and the opportunities for such studies in the future. Such studies may need to first develop scale measures specific to economic and political imperatives, prior to analysis aimed at determining causal interrelationships via such techniques as *fuzzy* Cross-impact Matrix Multiplication Analysis. An appreciation of the nature of interdependence between these two factors will certainly, in our opinion, facilitate the development of more fine-grained insights into interplay of political and economic factors bearing on PPP project success.

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