



# Identifying critical factors affecting the effectiveness and efficiency of tendering processes in Public–Private Partnerships (PPPs): A comparative analysis of Australia and China

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## Abstract

The success of Public–Private Partnerships (PPPs) largely depends on the performance of tendering processes. This research aims to conduct a comparative analysis of critical factors affecting the effectiveness and efficiency of PPP tendering in Australia and China. A triangulation of literature review, semi-structured interviews and questionnaire survey was used. The research identified 14 critical factors underpinning the implementation of PPP tendering, under 7 dimensions: (1) Robustness of business case development; (2) Quality of project brief; (3) Public sector capacity; (4) Governance structures; (5) Effectiveness of communication; (6) Balance between streamlining and competition; and (7) Level of transparency of tendering processes. The following analysis suggested that there are statistically significant differences in eight factors between the two countries. By adopting the recommended strategies, both public and private entities engaging in PPP projects will be at a better position to structure and manage the tendering processes.

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## 1. Introduction

Public–Private Partnerships (PPPs) have been widely applied in infrastructure sectors, such as transport, education, healthcare, and water and wastewater treatment. Despite the worldwide PPP application, PPP practices have not always yielded satisfactory outcomes, with a number of failed cases, such as the Sydney Cross City Tunnel Project and the Hangzhou Bay Cross-sea Bridge Project. One significant obstacle for using PPPs is concerned with inefficiencies and ineffectiveness in

tendering processes, characterized by lengthy durations, high transaction costs and a lack of competition and transparency (Dixon et al., 2005; Chan et al., 2010b). International practices suggested that if this concern is not addressed properly, PPPs may lead to sub-optimal value for money outcomes.

Considerable studies have been conducted to identify critical factors affecting the PPP implementation in general, providing reference on the development and management of PPP projects (Li et al., 2005; Zhang, 2005; Qiao et al., 2001). Researchers have also explored key factors impacting on specific processes of PPP procurement, such as the feasibility phase (Ng et al., 2012), the briefing stage (Tang and Shen, 2013), contract negotiation (Ahadzi and Bowles, 2004) and contract administration and performance monitoring (Robinson and Scott, 2009). However, the critical factors extracted in literature may

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not apply to the tendering stage. For example, the private sector's capability is deemed vital for achieving satisfactory cost and time performance, along with high-quality services. But it is of less concern for PPP tendering because in the trend of internationalisation, both overseas and domestic investors will tender for a PPP as long as the government has a consistent approach to PPPs and the project fundamentals are justified. Although a few studies have examined the main issues encountered in PPP tendering (KPMG, 2010; Carbonara et al., 2012), such studies, nonetheless, did not offer specific guidance on how to improve the effectiveness and efficiency of tendering processes through procedural and organizational arrangements, as well as management interventions.

The research presented in this paper therefore addresses this gap in knowledge. It aims to undertake a comparative analysis of critical factors affecting the effectiveness and efficiency of PPP tendering processes in a free market and a centrally planned economy represented by Australia and China respectively. The specific objectives are to: identify the critical factors affecting the effectiveness and efficiency of PPP tendering processes; investigate if there is significant difference in the critical factors in both countries; and propose useful and operational policy and management interventions to enhance PPP tendering processes. Australia and China were selected for the comparative analysis due to the intention to understand the variations arising from different social and economic contexts for PPP use, along with varied PPP development stages. Australia represents a typical free economy and it is a leading country in terms of PPP use, with established market and structured and consistent PPP policies. China is a centrally planned economy, in which the government plays a significant role in directing construction activities, including the promotion and implementation of PPP programmes. Also, China is an emerging market, remaining at an early stage in PPP development under fragmented and inconsistent legal and regulatory frameworks. Comparing the PPP tendering practices between the two countries provides an opportunity to understand how different contextual elements would shape varied PPP tendering processes, and to map the PPP development in terms of improving the "best practice framework" at the tendering stage.

According to Bryman (2008) and Amaratunga et al. (2002), the choice of research methods depends on the research objectives and the scope and depth needed for the research topic. A triangulation of literature review, semi-structured interviews and empirical questionnaire survey was used in this study. A comprehensive literature review was first conducted to identify the critical factors affecting the successful implementation of PPP projects. Based on the opinions and insights obtained from subsequent interviews, this research refined the list of critical factors to reflect their relevance to PPP tendering processes. A structured questionnaire survey was then administered in Australia and China to assess the relative importance of identified critical factors and compare them between the two jurisdictions. Based on the interview participants' views, as well as the results of the questionnaire survey, this research proposed policy and management interventions for improved tendering practices of PPPs.

## 2. An overview of tendering processes of PPPs in practice

The tendering process of PPPs is concerned with selecting a competent firm or consortium, with a sound technical solution for the proposed project, which offers value for money for governments and general community. Tenderers submit information describing their business qualifications and detailed technical and financial proposals, to be evaluated against a set of pre-defined criteria (World Bank Institute, 2012). Issues such as transaction costs, procurement duration, effectiveness of the selection, competitiveness and transparency and accountability need to be considered in PPP tendering (UNECE, 2004).

PPP tendering practices vary across jurisdictions and may differ between projects given their specific contexts. In accordance with the level of competition created, Felsing (2008) grouped them into three major categories, namely direct negotiation, competitive negotiation and competitive tendering, which are briefly discussed below.

### 2.1. Direct negotiation

Private sector entities sometimes directly approach governments with new ideas, which are beyond usual public procurement processes, but may offer opportunities to achieve best value (New South Wales Government, 2014). Such ideas or plans are typically referred to as unsolicited proposals. Being exercised in some emerging PPP markets (e.g., Indonesia, Philippines), such a sole-source process can introduce innovations into public service arenas and help to realize strategic objectives and infrastructure goals where governments have limited capacity to pursue. Without a competitive process, unsolicited proposals may lead to fewer transaction costs and shorter tendering duration. However, this approach is likely to incur transparency issues, perception of corruption by suppressing competition, and ultimately compromising value for money (Farquharson et al., 2011).

### 2.2. Competitive negotiation

Competitive negotiation is structured into four stages, including pre-qualification, invitation to negotiate, best and final offer, and preferred tenderer (Yescombe, 2007). The number of tenderers is reduced as the procurement process progresses. This approach is viewed as advantageous due to the higher possibilities of developing innovative solutions, tailored to characteristics of particular projects (Solino and de Santos, 2010). Meanwhile, concerns remain with a negotiated procedure as it allows extensive negotiations during the preferred tenderer stage, undermining competition tension. The transparency requirement for PPP procurement may also be compromised (Solino and de Santos, 2010).

### 2.3. Competitive tendering

Competitive tendering is regarded as a useful means to achieve value for money under PPPs (World Bank Institute, 2012). It is also the most commonly-used tendering procedures.

Generally, two categories of competitive tendering process are adopted, open procedure and multi-stage procedure. Open procedure allows a single-stage process without short-listing or pre-qualification. The government issues a call for tenders with project requirements and conditions (Garvin, 2010). Multiple tenderers submit binding tenders which will be evaluated on the basis of price without contract negotiation. PPP projects in Spain are generally procured through this procedure and the Spanish approach is viewed as simple and short processes (KPMG, 2010). However, under this approach, substantial project development, especially detailed design, is needed before bringing into market, which will possibly limit the room for innovation.

Broadly used in Europe, Canada and Australia, multi-stage procedure consists of an Expression of Interests (EoI) stage, a Request for Proposal (RfP) stage with interaction with tenderers, selection of a preferred tenderer and pre-award contract negotiations. These procedures are currently practised in various forms, including Competitive Dialogue procedure enforced in Europe and the Interactive Tendering model frequently used in Australia (KPMG, 2010). Whilst maintaining relatively high competitive tension and leaving room for innovative proposals, this approach is often criticised for lengthy negotiation and high tendering costs (Carrillo et al., 2008).

### 3. Critical factors affecting the success of PPPs

A large number of academics have sought to identify critical factors affecting the success of PPP implementation, which may affect the effectiveness and efficiency of PPP tendering processes (Qiao et al., 2001; Jefferies et al., 2002; Li et al., 2005; Zhang, 2005; Chan et al., 2010a). For example, Chan et al. (2010a) showed that critical success factors (CSFs) for PPPs can be grouped into five categories: (1) stable macroeconomic environment; (2) shared responsibility between public and private sectors; (3) transparent and efficient procurement process; (4) stable political and social

environment; and (5) judicious government control. Dulaimi et al. (2010) found political support and a strong private consortium are top CSFs. By conducting a comprehensive review of relevant published literature, eleven critical factors for PPP projects were extracted, which can be categorized under six headings, as shown in Table 1.

#### 3.1. Robustness of business case development

The robustness of a business case has a great bearing on the performance in later stages (Birmie, 1999; Qiao et al., 2001). The existence of service needs is critical to securing a sustainable PPP programme. Also, the project's economic and financial viability should be considered (Zhang, 2005). In addition, the governments' capital asset budgeting and planning, as well as the procurement option selection practices, are most relevant to the PPP tendering (Infrastructure Australia, 2008).

#### 3.2. Quality of project brief

A key distinguishing feature of PPPs is the use of output-based specifications (Grimsey and Lewis, 2004). Preparing a high-quality project brief, focusing on output specifications is a pre-condition for an efficient tendering exercise (KPMG, 2010). However, confusions usually arise over the government's objectives and evaluation criteria, creating difficulties in mutual understanding at tendering and negotiation stage. Researchers have found that the availability of PPP guidelines and standardized documents may increase the quality of project brief (Aziz, 2007; Garvin, 2010).

#### 3.3. Public sector capacity

Under PPPs, the public sector acts both as a contracting party and a regulating authority. The public sector capacity is reflected in the government procuring team's skills and expertise in structuring and implementing the processes, as

Table 1  
An overview of critical factors for PPPs identified from literature.

Group	Critical factors	Reference
Robustness of business case development	<ul style="list-style-type: none"> <li>● Existence of service needs</li> <li>● Project economic viability</li> <li>● Robustness of procurement option analysis</li> </ul>	KPMG (2010), Qiao et al. (2001), Birmie (1999), Mahalingam (2010) Zhang (2005), Tang and Shen (2013), Chen and Doloi (2008) Infrastructure Australia (2008), Yescombe (2007))
Quality of project briefs	<ul style="list-style-type: none"> <li>● Clarity of project brief and client requirements</li> </ul>	Li et al. (2005a), Chan et al. (2010a), Akintoye et al. (2003), KPMG (2010), Tang and Shen (2013)
Public sector capacity	<ul style="list-style-type: none"> <li>● Availability of PPP guidelines and standardized documentation</li> <li>● Public sector's experience and knowledge</li> </ul>	Aziz (2007), Garvin (2010), Mahalingam (2010), Li et al. (2005a) Jefferies et al. (2002), Dixon et al. (2005), Dulaimi et al. (2010)
Governance structures	<ul style="list-style-type: none"> <li>● Political support</li> <li>● Public sector leadership</li> <li>● Clarity and responsiveness of governance structures</li> </ul>	Chan et al. (2010a), Tiong (1996), Chen (2009), Li et al. (2005) Chen (2009), Qiao et al. (2001), Garvin (2010) Chan et al. (2010a), Chan et al. (2010b), Liu and Wilkinson (2014), Martins et al. (2011)
Level of competition in tendering processes	<ul style="list-style-type: none"> <li>● Competitiveness of tendering processes</li> </ul>	Zhang (2005), Kwak et al. (2009), Jefferies et al. (2002), Li et al. (2005), Birmie (1999)
Level of transparency of tendering processes	<ul style="list-style-type: none"> <li>● Transparency of procurement system</li> </ul>	Li et al. (2005a), Yescombe (2007), Chan et al. (2010a)

well as the government's level of commitment to the project and to the procurement model (Dixon et al., 2005). Having a strong and committed public procuring authority was crucial to make sure that the PPP transactions are properly structured (Li et al., 2005).

### 3.4. Governance structures

Good governance has been advocated by previous researchers as an integral part for a successful PPP (Li et al., 2005; Martins et al., 2011). Clear and responsive governance structures are central to ensuring that the tendering progresses in line with the pre-designed timeframes (Chan et al., 2010a).

### 3.5. Level of competition in tendering processes

The competition at the tendering stage is a key driver for value for money in PPP projects (Qiao et al., 2001; Dixon et al., 2005). Lacking of competition may result in situations in which sub-optimal solutions are opted for (Li et al., 2005). In the European Union, the PPP policies underpinned competition by enforcing the Competitive Dialogue tendering procedures (KPMG, 2010).

### 3.6. Level of transparency in tendering processes

The complexity nature, the core principle of “partnership”, in conjunction with the commonly spread, albeit incorrect, view seeing PPPs as another form of privatization, have made the transparency and accountability issues particularly sensitive in PPP tendering (Garvin, 2010; Mahalingam, 2010). Whether a transparent and accountable tendering exercise can be structured has a great impact on the public interests, which lie at the heart of PPP projects (Infrastructure Australia, 2008).

Existing research offers great insights into how to structure and implement PPP projects in order to achieve better value for money. However, studies of this kind are at high level, lacking of specific guidance on how to improve the effectiveness and efficiency of the tendering process. For example, a transparent and competitive tendering process is deemed significantly important for a successful PPP. How to achieve it through procedural and organizational arrangements as well as management interventions is nonetheless unknown, which is to be studied in this research.

## 4. PPP practices and policy context of Australia and China

This research focuses on a comparative analysis of Australia and China's PPP tendering practices. China has become the world's second largest economy and its construction sector has experienced a steady growth in recent years (Ling et al., 2014). International firms, such as architectural, engineering or construction (A/E/C) firms, operators and financiers, would be interested in entering into China's market and participating in PPP projects. China is a centrally planned economy, in which the government usually controls and directs the business sector. However, non-Chinese international firms are more likely to be

familiar with the business environment of an open market economy. In order to inform how different contextual elements would shape varied PPP tendering processes, Australia was selected to compare the findings from that of China as it represents a typical free market economy.

### 4.1. PPPs in Australia

Australia has developed one of the most sophisticated PPP markets. Having been practised for about two decades, PPPs are now considered as an important procurement option for advancing major infrastructure projects and associated services. As indicated in the National PPP Policies, the governments should consider a PPP for any project with a capital cost in excess of AU\$50 million (about US\$46.6 million) (Infrastructure Australia, 2008). Australian PPP activities are initially centred on economic infrastructure, in which the private sector is responsible for providing full-packaged services. The establishment of Partnerships Victoria and the release of Victorian PPP Policies marked the milestone for developing PPP programmes. Since then, the focus was shifted to non-core services PPP models in which the private sector is excluded from providing core services and much attention is paid to social infrastructure sectors. Under the current policy frameworks, the primary reason driving the choice of PPP procurement is to achieve value for money, significant design innovation, appropriate risk transfer and superior whole-of-life outcomes, as opposed to the initial driver being obtaining private sector finance and off-balance sheet treatment (KPMG, 2010).

Relevant institutional arrangements have evolved to accommodate the PPP development. A central coordinating authority, Infrastructure Australia, was set up acting as a centre of excellence. National PPP Policy and Guidelines issued later provide a common framework for PPPs. Despite no specific legislation specifying the rules and procedures of PPP tendering, relevant guidance documents served as useful reference when structuring PPP tendering. For example, the Practitioner's Guide sets out basic interactive tendering procedures and probity management protocols so that effective dialogue can be achieved provided the integrity is maintained. The Risk Allocation and Standard Commercial Principles delivered a clear message about the public sector's position in risk allocation and other contractual arrangements (Infrastructure Australia, 2008).

The PPP development in Australia is accompanied by continual debate on the efficiency of PPP tendering processes. Australian experience suggests that bidding and contracting costs generally account for 2.5–4% of the total cost of the project (National Infrastructure Unit, 2009). The Australian Council for Infrastructure Development was of a view that “unless tendering processes are well run it is possible that the benefits of using a PPP for delivering the project may be outweighed by the tendering costs” (Australian Council for Infrastructure Development, 2002). Duffield (2005) evaluated the PPP experiences in Australia and suggested that clear articulation of project objectives, accountability to the public and the private sector, competitive bids and a culture of partnerships are essential to ensuring a successful PPP, which are relevant to the tendering processes. Grimsey and Lewis

(2004) stressed that it is important to ensure accountability as it relates to the legitimacy of the government to engage with the private sector. Strong political leadership and unambiguous commitment are considered a driver for achieving value for money in PPP tendering (Cheung, 2009). KPMG (2010) assessed the procurement processes of Australian PPP projects and identified the impedimental factors to competition and procurement efficiencies of PPPs: (1) A largely unknown pipeline of projects; (2) A perceived lack of commitment to PPPs consistently across all Australian jurisdictions; (3) The magnitude of bid costs; (4) The skill and expertise of the Government team managing the procurement process; (5) The government's level of commitment to the project and the PPP procurement model.

#### 4.2. PPPs in China

China is an emerging market in terms of PPP development. Having experienced two decades' PPP application in water and wastewater and power stations, mainly in the form of build, operate, and transfer (BOT), the Chinese governments have paid increasing attention on employing PPPs to facilitate the urbanisation trend and deeper reform in capital asset management. The diversity of PPP models increased as the market matured. PPPs were chosen not only because of its ability to alleviate public spending pressure, but also due to the governments' policy driver to obtain better value. For example, in the Beijing Metro Line 4 Projects, the PPP approach was opted for as the government intended to utilise private sector expertise and skills to operate the metro line and therefore drive innovation across the metro systems (Liu and Wilkinson, 2013).

In China, the implementation of PPPs is subjected to legal constraints (Liu and Wilkinson, 2012). As for the PPP tendering, the procedures and arrangements need to comply with existing legislation, such as the Tendering Law 2000, the Contract Law 1999, the Government Procurement Law 2002, as well as sector-specific regulations. For example, unsolicited proposals are prohibited as given legal requirement by the Tendering Law 2000, all public procurement processes should be undertaken on a competitive basis. In addition to legislative requirements, a series of policies have been introduced to provide guidance on private sector involvement in the provision of public services, such as the Opinions on Acceleration of Privatization Process of Public Facilities 2002 by the Ministry of Construction (currently known as the Ministry of Housing and Urban Rural Development). Local governments have followed the initiative to release policy documents such as the Regulations for Franchised Operation of Beijing Basic Urban Facilities drafted by the Beijing municipal government. However, the legal, policy and regulatory provisions are inconsistent between different levels of governments and across sectors, leading to confusions when planning and implementing PPPs (De Jong et al., 2010).

According to Chan et al. (2010a), favourable legal framework, appropriate risk allocation and risk sharing and commitment and responsibility of public and private sectors are top three critical factors contributing to the success of PPPs in

China. Adams et al. (2006) found that in China, limited access to investment capital, lack of an effective PPP supervision system and discrepancy between policy and implementation of policy are critical factors impeding the execution of PPPs. Also, the robustness of project development and approval process, as well as the skills and experience of public agencies and leadership were believed to be central to China's PPPs (Chen, 2009).

Australia and China are at different stages in the use of PPPs for infrastructure development. The economies of the two countries differ, with varied contextual factors influencing the way in which PPP tendering processes are structured. Hence, a comparative study of critical factors affecting the effectiveness and efficiency of PPP tendering would inform international firms of unique concerns when operating in different markets.

## 5. Results and discussion

### 5.1. Critical factors identified from interviews

#### 5.1.1. Interview instrument

The first research objective was to identify the critical factors affecting the effectiveness and efficiency of PPP tendering processes. In order to achieve this objective, interviews were used as they enable themes and patterns to emerge by capturing interview participants' insights and perspectives on key issues encountered in planning and implementing PPP tendering processes (Kalof and Dan, 2008). The compiled list of critical factors identified from literature review can be modified and updated based on the different stakeholders' experiences across a wide range of PPP sectors. Also, interviews offer an effective means of performing an in-depth investigation (Denzin and Lincoln, 2005). The interview results can clarify and provide depth to the information yielded in subsequent questionnaire survey.

As opposed to the sampling strategy in quantitative research method, such as large-scale surveys, the purpose of which is to ensure the results can be statistically generalized to the population, qualitative research method (e.g. interviews), on the contrary, aims to choose information-rich participants to provide a thorough and sophisticated understanding of all dimensions of the subject matter (Liamputtong and Ezzy, 2005). The selection of participants in the interview stage of this research therefore follows a purposeful sampling logic that allows the selection to be narrowed down to a specific group of individuals who can provide rich and in-depth information on the tendering issues of PPPs in Australia and China. The criteria used for the sampling include their willingness to participate in the research, knowledge and experience in PPP projects and positions in respective organizations. The background information of the interviewees is shown in Table 2.

Fieldtrips to Melbourne and Beijing enabled the researchers to collect qualitative data. The interviewees were first contacted via e-mail and telephone. A face-to-face interview technique was used because it facilitates an in-depth investigation and allows for using probing questions to delve deeper into the issues identified. In order to prompt interviewees, a semi-

Table 2  
Background information of interviewees.

Case studies	Interviewee (code)	Main role of the organization in PPP	Designation	Years of experience with working or research in PPPs
Australia	AS1	State coordinating authority	Policy advisor	More than 5 years
	AP1	Public agency	Contractor manager	No direct PPP experience, but familiar with public sector procurement
	AP2	Public agency	Policy advisor	More than 10 years
	AC1	Construction company	Executive	More than 10 years
	AC2	Construction company	Senior manager	More than 5 years
	AF1	Facility management company	Senior manager	About 5 years
	AA1	Advisor	Associate	About 15 years
China	AA2	Advisor	Executive	More than 15 years
	CP1	Public agency	Policy advisor	About 10 years
	CP2	Public agency	Policy advisor	About 10 years
	CC1	Central coordinating authority	Policy advisor	More than 15 years
	CR1	Operator	General manager	More than 15 years
	CA1	Academics	Post-doctoral researcher	About 5 years
	CA2	Academics	Associate professor	More than 10 years
	CA3	Academics	Professor	More than 10 years

structured questionnaire, listing questions and possible factors identified from literature, was used to conduct the interviews. The main questions explored were:

- Based on your experience, how do you perceive the performance of PPP tendering processes, such as costs, durations, the level of competition created and the degree of transparency achieved?
- What are the critical factors affecting the effectiveness and efficiency of tendering processes of PPPs?
- Given the nature of your business/profession, can you describe the initiatives that you adopted to facilitate the implementation of PPP tendering and their effectiveness?
- Can you propose additional strategies to increase the likelihood of achieving effectiveness and efficiency in PPP tendering?

Fifteen participants (eight from Australia and seven from China) were interviewed. The duration of the interviews ranges from 45 min to one hour. All interviews were audio-recorded and transcribed. The qualitative data was managed, coded and analysed with the assistance by the qualitative data analysis software, NVivo 9. The software allows the development of themes and categories appeared or repeated in the interviews and conduct a comparative analysis of the texts under the same category.

### 5.1.2. Interview results and discussion

A review of relevant literature identified the critical factors affecting the effectiveness and efficiency of tendering processes in PPP projects. Interviews with fifteen PPP stakeholders from Australia and China further modify and refine the list of factors, which can be grouped into seven categories. A summary of critical factors identified from literature and based on interviews is provided in Fig. 1 and the interview findings are organized under seven sub-headings.

*5.1.2.1. Robustness of business case development.* Factors pertinent to business case development, such as the availability of sufficient project pipelines and the robustness of procurement option analysis were raised by interviewees. As argued by AA1, “How well the government can flag the pipeline of projects is important.” AS1, AP2 and AA2 revealed that in Australia, the project pipelines and deal flows are of sporadic nature, lacking of transparency and certainty over time. Without a pipeline of opportunities, it is difficult for private companies to commit their resources to a particular PPP due to the high possibility that they may not recover tender costs if losing this one.

China has a much larger infrastructure market, with continuing attraction to worldwide private sector entities. In spite of the large infrastructure needs, the Chinese participants acknowledged that the investment planning and decision-making is usually undertaken on a fragmented basis, rather than a systematic and whole-of-government approach. In absence of a high-level, coordinated and sustainable infrastructure development plan, the private sector remained uncertain about the government’s policy directions. For example, as CA1 and CA3 contended, the rapid growth in urban rail investment triggered the emergence of PPP projects, such as the Beijing Metro Line 4 and Line 14. However, the expanding programme experienced unexpected downturns, undermining the private sector’s confidence in the continuity of PPP development.

The Australian interviewees explained that not viewing PPPs as the default delivery model, to large extent, limited the PPP pipelines. This sometimes resulted in governments opting for other procurement options which might be best suited for PPPs due to lacking of clear criteria for project identification. Despite the likelihood that good opportunities for PPPs are missed, AS1 and AA2 contended such problem may still exist in light of the Australian jurisdictions’ budgeting practices that governments will only proceed with procurement option analysis after full budgetary allocations are made within their budgeting cycle. A PPP will be selected provided that the value

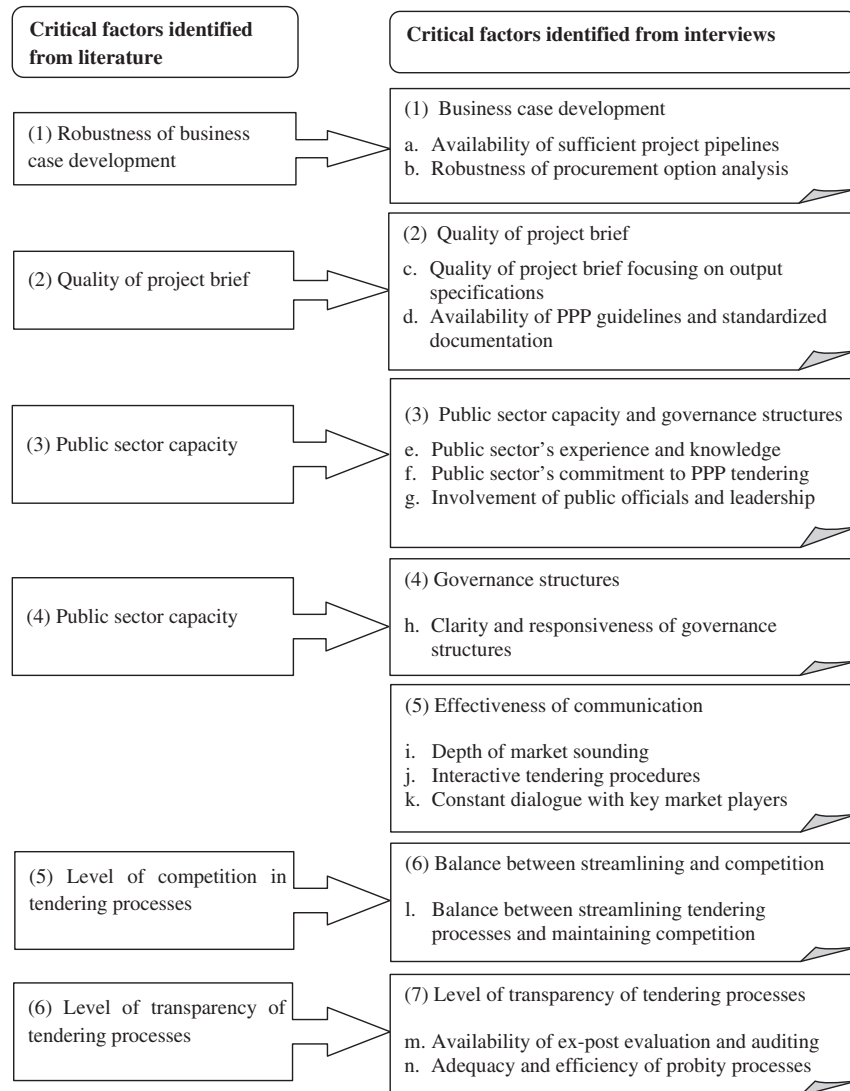


Fig. 1. A summary of critical factors for PPP tendering from literature and from interviews.

for money outcomes justified based on quantitative. This approach can limit the number of PPP deals, or at least postpone the timing of PPP projects entering into the market.

Although PPPs are considered as the preferred delivery model by many Chinese governments, the participants casted much doubt on the procurement option analysis practices. Indeed, the number of PPP proposals may increase without going through a rigid value for money assessment for PPPs. However, the possibility that a PPP is granted, albeit unsuitable, may increase correspondingly. If the project fundamentals cannot justify a good investment opportunity, not enough competition can be realized in PPP tendering.

Existing literature identified that developing a well-articulated business case is a pre-requisite for successful PPPs (Chan et al., 2010a). This research suggests it is also relevant to the tendering process, although the emphasis is slightly different. For example, conducting a robust individual project-based service need analysis by setting key investment objectives, documenting

existing arrangements and specifying service gap is essential to ensuring the long-term viability of a PPP project. However, a programme-level focus, as well as a whole-of-government approach is required in order to achieve an enhanced PPP tendering exercise as the private sector entities are interested in continuing investment opportunities rather than merely achieving a desired level of profit in a particular project. Furthermore, the Australia and China's PPP tendering practices confirmed Garvin (2010) and Aziz's (2007) assertion that the choice of procurement option should be based on meticulous analyses. Lacking of a robust option analysis tool will result in a suitable PPP project being abandoned or PPPs being adopted without justified reasons.

**5.1.2.2. Quality of project brief.** All interviewees asserted that preparing a high-quality project brief, focusing on output specifications is a pre-condition for an efficient tendering exercise. AC1 and AC2 found that in Australia's PPPs, inconsistencies usually exist in tender documents. The specifications, as well as

the tender evaluation criteria, sometimes cannot be coherently interpreted by various parties, or may restrict private sector innovation over time. For example, AC1 elaborated,

The output specifications and service specifications sometimes were contradictory to each other, leaving much room for the project director to interpret the requirements...The only way you can reduce the barrier is to make the project brief simpler and project-specific.

With respect to the perceived problem, AP2, AC1 and AF1 found that the broad suite of PPP guidelines and standardized documentation served as a useful means to increase the quality and coherence in tender documentation. The Victoria State's PPP practices served as an example to demonstrate the importance of standard model:

The Victorian model has been around for many years and it has been very stable .... In the marketplace, the organizations participating are quite familiar with [it]. There is a national framework now. So we sort of know what to expect. From the interactive workshop, you get the sense of what are important to the client, which helps you to develop your tenders. As a consequence, in Victoria, it is easy to understand the process. (synthesis of views of AP2 and AF1)

The Chinese interviewees reinforced the difficulty in providing well-defined project brief. CP1 and CP2 stressed that compared with countries like Australia, where a standard and well-known model is in place, it is even harder for public procuring authorities in China to clearly state their requirements and evaluation criteria. Inability to convey important information in the tender documentation then leads to contingent issues to be discussed at the negotiation stage, postponing tendering schedules.

This research concurs with previous findings that clear project briefs with carefully drafted output specifications are CSFs for PPPs (Akintoye et al., 2003). Robinson and Scott (2009) argued that output specification specified what accommodation and services are required, forming a key component in service delivery of PPPs. As opposed to the important part in performance measurement for the contract management stage, the main role of well-understood and consistent specifications is to ensure that the private sector tenderers are better informed and instructed in preparing and submitting their tenders. Also, this research strengthens Garvin (2010) and Mahalingam's (2010) assertion that PPP guidelines and standardized documentation provide a standard and consistent approach towards the execution of PPPs. The availability of such guidance contributes to streamlining the tendering processes.

*5.1.2.3. Public sector capacity.* The Australian interviewees highlighted the importance of public sector's experience and knowledge and agreed that the departments generally have extensive experiences running PPP projects. A number of highly-capable PPP specialists are available, driving the PPP processes. When departments with less experience are initiating PPPs, such

as the case of Partnerships Victoria in Schools Project, experts from the state coordinating authority (the Department of Treasury and Finance) were embedded in the project team to oversee the procurement and offer expert advice in preparing the documentation and tender evaluation.

Despite the consensus amongst the Australian participants that the public sector has the required skills and expertise to engage PPP tendering, a lack of commitment to the PPPs was found to be a barrier to market entry and sustaining competition. Sometimes the process was prolonged because the governments' commitments to timelines were not adhered to. Participants AP2 and AS1 stated:

A really important thing for us is to stick to what we have said. If we said we were going to do something at certain stages, we have to deliver it. We promise something in market sounding. The commitments need to be followed through. If we start waiving, the market gets nervous. (synthesis of views of participants AP2 and AS1)

Compared to Australia, where strong and dedicated public procuring teams are available, the Chinese participants expressed concerns with the government's capability to lead the PPP tendering process given its inherent complexity, fragmented legislative environment and lack of PPP experiences. Although PPPs have been used in China in a variety of forms, such as BOT, the implementation of the PPPs was on an individual basis, without a standard and consistent approach. Different levels of governments engage with the private sector for varied policy objectives. Hence, the experiences and knowledge gained through previous PPPs cannot be sufficiently applied to new projects.

In absence of a highly-capable public sector, the Chinese participants emphasized the importance of leadership and political commitment. Participant CP1, CP2 and CA1 indicated that in the case of Beijing Metro Line 4 Project, the government officials were involved in the project steering committee and kept well informed at various decision-making points. Such involvement facilitated the government to respond to the tricky issues encountered faster and in a more efficient manner. Also, the effective role of the project team from the Beijing Infrastructure Investment Co. Ltd. (acting on behalf of the government authority) was attributed to sufficient empowerment from the government.

Prior studies have reiterated that the public sector's skills and experience have an influence on the success of PPP projects (Kwak et al., 2009). The findings of this research suggested that it is of particular importance for tendering processes. Compared to the contract management phase, in which the responsibility of the public sector is mainly about monitoring the private sector's compliance with contractual requirements (Robinson and Scott, 2009), at the tendering stage, the focus is how to mobilize public sector resources and skills to make sure that the most suitable partner is selected efficiently. Given the complex and inflexible nature of PPPs, structuring PPP tendering poses additional requirements on the public sector's capacity than that of traditional delivery models. It is notable that the importance of public



sector's commitment to PPP tendering and involvement of government officials emerged from the interviews and were not apparent from the literature, indicating that these factors are unique features for the tendering processes of PPPs.

*5.1.2.4. Governance structures.* Seven participants (four from Australia and three from China) maintained that clear and responsive governance structures are central to ensuring that the tendering progresses in line with the pre-designed time-frames. AP2 explained that based on past experiences, in most occasions, PPP tendering procedures were prolonged because the governments failed to make timely decisions at key milestones. Delayed schedules may then incur increased costs. CP1 and CP2 added:

Without clear lines of reporting between different levels of governments, and between different industrial ministries, informed decision making at the right time would be impossible. Sometimes we spend too much time waiting for approvals. This is always the main reason for time delays. (synthesis of views of CP1 and CP2)

AP1, AP2 and AS1 further claimed that by drawing on best practices, the public sector basically, in recent attempts, has put in place an effective four-level governance structure. This consists of a project board, involving PPP specialists, such as commercial, legal, technical and services specialists, a project steering committee, ministers for departments/ministries, and cabinet sub-committee. AP2 elaborated on how the governance structure operates:

We have a core group where the PPP specialists and representatives of the Department meet on a weekly basis. There is a steering committee meeting on a monthly basis to ensure the perspectives of the project remain on track .... At key milestones, you need decisions from the ministers. When we get on the Cabinet agenda, a sub-committee will (be) set up. I think through this route, we ensure that we maintain a right path and can reflect on the potential barriers.

Similarly, CC1, CA1 and CA2 pointed out that when reviewing Chinese past experience with PPPs, a responsive governance structure was a key attribute underpinning the smooth progression of PPP tendering. For example, in the case of Chengdu No. 6 Water Plant B Project, a Tendering Committee, including core in-house personnel, was dedicated to assisting with crafting the contract documentation, applying for approvals and interacting with potential tenderers. Also, a BOT coordinating committee, comprised of officials from different government departments was established to oversee the process, respond to important issues raised and coordinate with relevant authorities to make timely decisions. In addition to governance at the municipal level, the central government monitored the whole procurement through the active role played by the State Development and Planning Commission (Chen, 2009). As commented by CC1, "Having the right people

sitting there at the time you need permissions was the key for the success of PPP tendering".

This study confirms the important role of good governance, as identified by Martins et al. (2011) and Li et al. (2005), and indicates that it is primarily reflected on setting up effective governance structures for PPP tendering to ensure timely decisions-decision making. In comparison to the service delivery stage at which the governance structures usually refer to clear reporting lines to ensure performance monitoring, the tendering stage requires setting up responsive decision making lines by involving the relevant officials at the point they are needed.

*5.1.2.5. Effectiveness of communication.* Interviewees from both Australia and China believed that frequent and effective communication between the public and private sectors was beneficial for understanding each other's requirements and needs, avoiding potential problems, and thus reducing tendering duration and costs. The dialogue should be carried out by undertaking extensive marketing sounding, conducting an interactive tender process and keeping constant contacts with main market players.

AS1 and AP1 maintained that the market sounding is a must-do exercise under the Australian PPP guidelines, and it can be used in testing the capacity and interests of the market to provide the required services, obtaining feedback concerning the service requirements and possibly reconfiguring the PPP deal to increase the viability. Such exercise was deemed useful to ensuring the competition at the tendering stage. The Chinese interviewees, nonetheless, argued that with sufficient infrastructure needs and investment opportunities, the China's PPP market maintains considerable attraction to international private players. An extensive market test seems to be of less importance, unless in circumstances that the project's economic viability is uncertain, the private sector's needs should be captured through pre-tender, informal meetings.

The Australian interviewees highlighted the importance of following interactive tendering procedures at the RfP stage as such procedures promote mutual understanding of the project requirements and expectations and reduces the possibility of having to call for revised tenders (Infrastructure Australia, 2010). For example, AP2 pointed out that a useful means to improve the effectiveness of tendering is to keep the tenderers informed by holding a series of interactive sessions of communication in the presence of probity officers. AS1 and AP1 added:

We tried to make sure they had best possible information. The interactive tendering session helped to manage the process. Through an interactive dialogue, tenderers won't waste money on developing unnecessary solutions. (synthesis of views of AS1 and AP1)

Whilst admitting the importance of frequent and effective dialogue, CC1 and CR1 expressed the concern with the propriety issues. Lacking of established probity practices in place, the private sector tenderers were concerned about how their intellectual properties to be protected. With respect to the records of the Chinese governments not delivering their

promises in PPPs, private sector participants called for the introduction of robust propriety management protocols.

Four interviewees from Australia contended that it is instrumental for both public and private sectors to sustain constant contacts, not only restricting to time when projects are in the market. AF1 elaborated that the market players were keen on maintaining long-term relationship with the government to understand the culture and approach towards public sector procurement, so that fewer resources (e.g., legal or commercial consultancy costs) may be needed when engaging future PPP attempts. AS1 and AA1 stressed:

We (the government) indicate to people at the time we are going to detailed business case. That is prior to being approved as PPPs, but the market knows that we are undertaking a serious PPP investigation as opposed to a preliminary investigation. (synthesis of views of AS1 and AA1)

The interviews identified that effective communication, not apparent in existing PPP literature, is the core for a successful PPP tendering. Under traditional procurement, in which competitive tendering is the dominant approach to select service providers, such as the selection of construction companies, the market sounding exercise is generally simplified as a mature industry has been established with the market understanding the tendering model (Zou, 2007). However, as shown by the research results, for PPPs, it is crucial to gauging the market's interests and capability prior to tendering. This may be explained by the complexity of PPP transactions arising from the integration of responsibilities and risk allocation. Also, engaging interactive dialogue seems of great importance for PPP tendering. Compared to traditional procurement, where the procedures and timing for carrying out communication are comparatively clear and structured, the scope and depth for dialogue in PPP tendering processes differs due to the high uncertainties of service requirements over long concession periods. The involvement of multiple parties (e.g., financiers, builders, facility managers) leads to discussions about service provision from different perspectives, creating the need for establishing effective communication channels. As opposed to the PPP contract management stage, in which the role of communication centres on coping with contract variations and interface issues, at the tendering stage, the dialogue is more high-level, with an aim to foresee possible problems and attempt to adopt appropriate mechanisms to ensure the smooth progression.

*5.1.2.6. Balance between streamlining and competition.* Ten participants (five from Australia and five from China) highlighted the issue of striking a balance between streamlining the tendering process and maintaining competition. According to the AP1, AA1 and AA2, in light of the current development status, Australia should place more emphasis on achieving a streamlined process over high-level of competition. This is because that as a relatively good level of competition has been reported in recent PPP attempts, although a shortage of facility managers, to some extent, hindered the desired competition.

The need for the streamlining stemmed from a variety of reasons deemed responsible for a prolonged tendering process and high tender costs. The reasons encompass excessive tender requirements, asking for fully committed finance and keeping multiple tenderers to late stages. The participants commented,

The duration of tendering highly impacts on tender costs. It is beneficial to get the preferred tenderer earlier .... The level of details required is partly responsible for the tender costs .... The government should not ask for committed finance because the banks take much time in due diligence. (synthesis of views from AS1, AP1 and AA2)

AP1 and AP2 further elaborated that for small-sized projects such as schools, they should request less information or lower level of details of drawings for the tender submission, although the submission still need to be detailed enough to evaluate the select the preferred tenderer. Instead of asking for committed finance, other forms of guarantee, such as Indicative Term Sheet, may be acceptable. Adopting a relatively streamlined exercise, the procurement of a recent school project (Partnerships Victoria in Schools Project) was fast-tracked, gaining reputation for achieving efficiency.

The Chinese interviewees claimed that as required by the Tendering Law 2000 and the rules set out in the World Trade Organization Government Procurement Agreement, much emphasis has been placed on guaranteeing competition. This was manifested in the fact that the majority of early BOT projects were procured via international competitive tendering. Even when competitive tendering was impossible due to the limited number of international players, such as the case of the Beijing Metro Line 4 Project, the public sector agency tried hard to maintain the competitive tension. The number of tenderers gradually reduced as the competitive negotiation proceeded. Two joint ventures – MTR-BCG (Beijing Capital Group) and Siemens-CRC (China Railway Construction Corp. Ltd) – were kept to the last stage before the MTR-BCG consortium won the tender. In spite of the current focus on sustaining competition, the participants (CP1, CA2 and CA3) suggested that streamlining the process will be possible once a standard, consistent and stable model is to be developed.

It seemed to be paradoxical that competition was seen as the key driver for value for money in PPPs (Dixon et al., 2005) and streamlining was essential for improving the efficiency (KPMG, 2010). How to strike a balance becomes a central issue for the PPP tendering processes. Given the varied market maturity level and different social, economic and policy context, the priority varies. Similar to the Australian practices, where the industry calls for streamlined tendering processes, the New Zealand government was pushed by private sector players to streamline the process, with regard to the small size of economy and projects as well as lacking of market depth (Liu and Wilkinson, 2014). Under strict legal requirements, the countries in European Union, underlined the importance of maintaining competition by enforcing the Competitive Dialogue tendering procedures, which have proven to result in prolonged tendering durations. When facing the trade-off, public procuring

authorities should take both context and project-specific characteristics into consideration in order to strike a balance.

*5.1.2.7. Level of transparency of tendering processes.* All Chinese interviewees mentioned the accountability and transparency issues in the PPP tendering exercise. The track record of corruption in China's construction industry, further raised the concern that how the issues are dealt with in PPP tendering. CA1 and CA2 contended, "A key issue with PPP tendering is the transparency, especially in current circumstances that the general public is so concerned with the corruption issue in spending taxpayer's money." (synthesis of views of CA1 and CA2).

Currently, lacking of post-project auditing was cited as a major hindrance to ensure a transparent process and decision makers accountable to the general public's interests. "We are not good at evaluating the project on an ex-post basis, but this is definitely becoming a focus of our work. Actually we are working on a post evaluation right now." (CP1) Australian jurisdictions have developed probity protocols, widely applied in the PPP projects. Currently, probity management is embedded in the PPP procurement process. AP1 and AA2 were of a view that the probity process helped to guarantee that the tendering process is organized following the principles of fairness, equality and impartiality. By involving clearly specified evaluation criteria in tender documentation, decisions are made based on clear justifications, conducive to ensuring the integrity of PPP process. However, they asserted that strict adherence to the probity rules may cause inflexibility and hinder smooth communication. The probity taking control of the tendering process will lead the tenderers being frustrated with the lack of commerciality, limiting the potential of private sector proposing innovative solutions. As suggested by AA2, the government should review the current probity management practices, diagnose the areas accounted for inefficient tendering and amend them after a thorough discussion with the industry. Being aware of the probity processes exercised in countries, such as Australia, the Chinese interviewees hoped that such practices can be introduced to China's PPPs, enhancing the possibility of achieving a transparent and accountable PPP tendering.

Since the introduction of PPPs, there has been a perception that such procurement routes may endanger the integrity of the tendering process (Garvin, 2010). It especially drew much attention in countries like China and India, where the transparency and accountability in public sector procurement casted considerable public doubt (Mahalingam, 2010). Establishing post-project performance and process evaluation and strengthening the auditing exercise recommended by the Chinese participants concurs with current practices adopted in countries, such as the UK and Australia, in which the national auditing office conducts constant review of their PPP projects. For example, the *New Zealand Office of Auditor-General (2011)* examined the implications of PPPs on New Zealand's public service delivery by drawing on lessons learned from two pilot PPP projects, despite both of them yet being operational when the review occurred. The issue with probity process in PPPs has been reported in prior literature. Templeman and

Paradise (2006) argued that the probity protocols have inhibited achieving commercial outcomes. This is consistent with the views from Australian participants. Hence, the government is encouraged to streamline its probity and process deed after seeking feedback from the industry.

## 5.2. Results from questionnaire survey

### 5.2.1. Questionnaire survey method

The second objective of this research was to investigate if there is significant difference in the critical factors affecting PPP tendering in Australia and China. An empirical questionnaire survey was undertaken in both countries. Data was collected through a structured questionnaire. Section A asked the information of a completed project. Section B requested the respondents to rate the degree of importance of the identified critical factors from their own perspective using a five-point Likert scale from 1 to 5, in which 1 represents "least important" and 5 symbolizes "most important". Section C requested for demographic characteristics of respondents and their organizations.

The two main criteria used for selecting survey respondents comprised of: (1) having a good understanding of PPPs; (2) with hands-on experience in tendering processes of PPP projects. The target respondents include practitioners from public procuring authorities, PPP Project Company and consultancy companies. Survey respondents were identified from available information providing PPP projects, involved organizations and practitioners (e.g. Infrastructure Australia's website, China's PPP research centre's website). The potential respondents were then approached through e-mails. Also, the researchers attended a series of PPP workshops or seminars held in China. Questionnaires were distributed through direct interactions with the attendees.

Survey questionnaires were sent to 154 target respondents (73 in Australia and 81 in China). A total of 25 completed questionnaires from Australia and 32 from China were returned, representing response rates of 34% and 40%, respectively. Table 3 shows the background information of the respondents. It should be noted that none of them were involved in the interviews. The following data analysis was performed using the Statistical Package for Social Science (SPSS). The significant level for the tests was set at 0.05.

The data from the questionnaire survey was analysed using one-sample t-test and independent sample t-tests. One-sample t-test was carried out to identify if the critical factors identified from prior stages are statistically significant. The test value was set at 3, the mean of a five-point Likert scale. If  $p < 0.05$  and the t-value is positive, it indicates that the factors have a significant impact on tendering processes of PPPs. Independent sample t-tests were then conducted to test if there is a difference between two sample groups on the means of critical factors for PPP tendering. The Levene's test was first performed to determine if equal variances between the two groups should be assumed. A significance of greater than 0.05 indicates that equal variance can be assumed. Following the Levene's test, the t-tests were carried out. Factors with a significance level (2-tailed) less

Table 3  
Background information of questionnaire survey respondents.

Characteristic		Australia		China	
		No.	%	No.	%
Experience in PPP projects	<5 years	2	8%	5	16%
	5–9 years	10	40%	14	44%
	10–14 years	7	28%	9	28%
	≥ 15 years	6	24%	4	12%
Organization type	Public procuring authorities	7	28%	11	34%
	PPP project company	12	48%	17	53%
	Consultancy companies	4	16%	3	10%
	Others	2	8%	1	3%
Positions in their organizations	Senior-level management	7	28%	10	31%
	Middle-level management	14	56%	16	50%
	Undertaker	4	16%	6	19%

than 0.05 suggests that there is significant difference in the means between two respondent groups.

### 5.2.2. Survey discussion

The importance of critical factors, identified from previous interviews was then assessed based on different perceptions of the Australia and China's respondent groups through the questionnaire survey. Table 4 presents an overview of the results of one-sample and independent t-tests, showing the significant differences in critical factors between the two countries.

Table 4 shows that according to the Australian respondents, only two factors, namely “availability of ex-post evaluation and auditing” (Sig. 0.824) and “involvement of public officials and leadership” (Sig. 0.692), have a significant level greater than 0.05. The two factors are not statistically significant for PPP tendering whilst the other twelve factors significantly influence the tendering processes of PPPs. In comparison, the Chinese respondents perceived nine critical factors as statistically significant. The rest of them, including “availability of sufficient project pipelines”, “public sector's experience and knowledge”, “depth of market sounding”, “interactive tendering procedures” and “balance between streamlining tender

processes and maintaining competition”, were of less concern for the Chinese respondents.

The rankings of the critical factors based on the calculation of mean scores are given in Table 4. “Clarity and responsiveness of governance structures” was rated as top three critical factors by respondents from both Australia and China. Besides, they gave similar responses to “adequacy and efficiency of probity processes” (ranked the eighth in both countries), “public sector's commitment to PPP tendering” (ranked the fourth in Australia and fifth in China), and “robustness of procurement option analysis” (ranked fifth in Australia and second in China). Also, both Australian and Chinese believed that “quality of project brief focusing on output specifications” and “availability of PPP guidelines and standardized documentation” are significantly important for the tendering processes of PPPs. The findings reveal that these factors were important irrespective of the different economic, social and policy contexts. It therefore suggests that these critical factors are pertinent to both the free market and centrally planned economy.

The results of the independent t-test, as shown in Table 4, indicated that significant differences exist in eight critical factors (with a significant level less than 0.05) between the two

Table 4  
Comparison of critical factors for PPP tendering between Australia and China.

	Australia				China				Equality of means	
	Mean	Rank	T-value	Sig.	Mean	Rank	T-value	Sig.	T-value	Sig.
1a. Availability of sufficient project pipelines	4.32	1	11.854	.000	3.16	10	1.094	.282	6.148	.000
1b. Robustness of procurement option analysis	4.00	5	5.477	.000	4.25	2	9.843	.000	-1.158	.252
2c. Quality of project brief focusing on output specifications	3.56	10	2.791	.010	3.66	6	5.685	.000	-.437	.664
2d. Availability of PPP guidelines and standardized documentation	3.44	12	2.529	.018	3.63	7	4.458	.000	-.838	.406
3e. Public sector's experience and knowledge	3.96	7	7.103	.000	2.91	14	-.551	.586	4.648	.000
3f. Public sector's commitment to PPP tendering	4.00	5	6.547	.000	4.19	4	9.105	.000	-.938	.353
3g. Involvement of public officials and leadership	2.96	14	-.225	.824	4.50	1	13.638	.000	-7.690	.000
4h. Clarity and responsiveness of governance structures	4.28	2	8.683	.000	4.22	3	9.760	.000	.319	.751
5i. Depth of market sounding	4.08	3	7.111	.000	3.00	12	.000	1.000	5.318	.000
5j. Interactive tendering procedures	3.48	11	3.116	.005	2.97	13	-.254	.801	2.628	.011
5k. Constant dialogue with key market players	4.04	4	6.186	.000	3.44	8	3.091	.004	2.758	.008
6l. Balance between streamlining tender processes and maintaining competition	3.60	9	3.133	.005	3.06	11	.442	.662	2.308	.025
7m. Availability of ex-post evaluation and auditing	3.08	13	.401	.692	4.00	5	7.043	.000	-3.860	.000
7n. Adequacy and efficiency of probity processes	3.72	8	4.548	.000	3.44	8	4.385	.000	1.572	.122

countries. This suggests that unique issues encountered by a free market economy and a centrally planned market, represented by Australia and China. Australian respondents rated “availability of sufficient project pipelines” and “depth of market sounding” the first and third in terms of their importance”. On the contrary, they were only ranked tenth and twelfth in China. This is because that China has a much larger infrastructure market, maintaining continuing attraction to worldwide private sector entities. With respect to foreseeable future business opportunities, private sector companies are willing to establish offices, allocate resources, and tender for China’s PPPs even if their desirable profit level is compromised. For example, in the Beijing Metro Line 4 Project, the private investor, Hong Kong Mass Transit Railway (MTR), tendered the project not only intending to accomplish the anticipated business performance in this project, but also to build up reputation in mainland’s urban rail market to secure long-term profits and returns on investment. Bearing the long-term development strategy in mind, MTR made compromises at the competitive negotiating stage, reducing total tendering durations.

A significant difference observed between the two groups of respondents was their perceptions about “involvement of public officials and leadership”. Being considered the most critical factor in China, it was ranked the last by Australian respondents. Lacking of standardized procedures in place, as well as capable public procuring authorities and assistance from central PPP units, the progression of China’s PPPs rely much on the involvement of public officials and their leadership. This may also explain why “public sector’s experience and knowledge” was perceived as least important in China whilst being rated seventh in Australia.

As opposed to their Australian counterparts, the Chinese respondents gave lower ranks for “constant dialogue with key market players”, “interactive tendering procedures”, and “balance between streamlining tender processes and maintaining competition”. This indicated that with a track record of corruption issues in the construction industry, Chinese PPP practitioners have paid much attention to maintaining integrity in tendering practices. Currently, China has imposed strict rules on project teams approaching market players when engaging public sector procurement. Public clients have lesser rights to offer future relationships with private sector partners and maintain constant contacts with market players. Similarly, the Chinese respondents were not keen on streamlining the processes with regard to strict requirements to keep competitive tension at the tendering stage. In addition, given the concern for integrity issues, public project teams are refrained from a large amount of direct interaction with shortlisted bidders tendering, as is commonly adopted in Australia. The varied opinions may also be attributable to distinct stages of PPP development in the two countries. With established protocols for conducting interactive tendering, Australian PPP practitioners have been familiar with such procedures. The interviewees argued that interactive tendering, in the form of presentations, meetings or workshops, is an effective means of clarifying clients’ expectations and assisting with bid development. It is seen as essential to ensuring the bid quality, which greatly contributes

to the effectiveness of PPP tendering. Since PPPs are relatively new in China, public procuring authorities remain uncertain about how to proceed with conducive, two-way communication with private bidders. The importance of undertaking interactive tendering was hence not fully recognised by the Chinese respondents.

It is notable that the Chinese respondents rated “availability of ex-post evaluation and auditing” the fifth in terms of its importance as opposed to the thirteenth ranked by Australian respondents. Such difference in opinions may arise from varied practices of the public sector’s capital asset management. Australia has introduced a periodic auditing exercise in public sector procurement. Having an independent department, such as the Victorian Auditor-General’s Office in the Victoria State, to undertake a thorough scrutiny of the procurement process of PPPs, the transparency and accountability issues can be coped. By contrast, China has yet developed a well-established auditing practice for construction projects. Without such practice in place, the Chinese respondents highlighted the important role of ex-post evaluation and auditing when embarking on PPP projects.

## 6. Recommendations

Based on the interview participants’ insights and perspectives, as well as the results of the questionnaire survey, policy and management interventions for improved PPP tendering practices are derived, which fulfils the third objective of this research. The fourteen critical factors, fell within seven categories, provide a framework within which both countries, Australia and China, can set their own policies and management strategies to position themselves to perform more effectively and efficiently in PPP tendering. The most useful recommendations are outlined as follows:

- Governments shall set up robust business case development procedures and methodologies. It is important to make sure that a transparent and consistent approach is adopted when conducting investment planning and service need analysis. A programme-level focus, along with a whole-of-government perspective is preferred. In addition to the quantitative value for money assessment tool (e.g., the Public Sector Comparator, PSC), commonly used in countries like the UK and Australia, the research suggests that clear criteria should be established by governments to determine whether PPPs should be selected as the delivery model.
- Once a PPP route is confirmed, the public sector must endeavour to provide quality tender documentation that can be accurately and coherently interpreted by relevant stakeholders. With regard to the difficulty in drafting output specification and other commercial principles, such as risk allocation schemes, it is beneficial to develop standardized documents, together with policies and guidelines to lay out a common framework supporting PPP transactions. For countries lacking of PPP policies and guidelines, such as China and Indonesia, the government should develop a national legal framework for PPPs, laying out the basic elements about PPPs, such as the government’s position in risk allocation.

- The public sector's capacity varies given the different PPP development stages and the past experiences with PPPs. When public procuring authorities lack of skills and expertise to structure and run PPP tendering, guidance and assistance from central PPP units is essential for closing the capacity gap. In addition, the project team needs to follow their commitments made when approaching the market, such as the pre-defined tendering timelines.
- Clear and responsive governance structures need to be set up to ensure relevant government officials are involved in critical decision-making points of PPP tendering. Through strong leadership of the public sector, necessary resources will put in place and coordinated to accommodate the needs arise at different stages.
- Probity process and deed is a means of ensuring transparency and accountability. Although such protocols received concerns, it remains a useful tool to regulate the public sector's behaviours. Tailored to specific social and economic contexts, the probity process can be replicated in other jurisdictions, such as China, India and Malaysia.

The recommendations to improve Australia's PPP tendering practices are given as:

- Proceeding to executing the tendering exercise, the public sector needs to conduct an extensive market sounding to gauge the capacity and interests of the market, and probably to amend the project fundamentals if necessary. As for government departments with continuing project flows, it is crucial to sustaining long-term relationship with key market players. Frequent contacts through industry workshops and seminars would foster their cooperation in future attempts.
- A knowledge sharing mechanism needs to be established, which allows PPP specialists to share their experience and knowledge across departments. When facing the capacity gap, the assistance from the central PPP unit would be beneficial.
- Streamlining the tendering process and maintaining competition are both objectives for PPP tendering. A balance should be achieved when structuring the process. Priorities should be placed according to the scale and complexity of a particular project. For projects with lesser complexity and smaller scale, a streamlined process is desirable. Asking for less detail in tender submission, not requiring committed finance and choosing the preferred tenderer at earlier stages are possible ways to realize the streamlining.
- It is vital to promote constructive dialogue at the tendering phase. The Interactive Tendering Procedures, commonly adopted in Australia, should be consistently applied and refined to facilitate the private sector to gain a better comprehension of the government's requirements.

The recommendations to improve the tendering processes of PPPs in China are:

- In contrast to leading countries for PPP development, such as Australia, where a PPP unit has been established to oversee

and support the PPP activities, in China, the involvement of multilateral organizations, such as the World Bank and the Asian Development Bank, supplements the public sector capacity. Acting as finance institutions, the multilateral organizations frequently invest in developing countries' PPP projects given their interests in mobilizing international financial resources to promote infrastructure development. Since international PPP experts are usually involved in the multilateral financiers' project team, their legal, commercial and technical assistance to host governments are conducive to increasing the performance of PPP tendering.

- Government officials should be extensively involved in the project development and tendering stage to guarantee that tricky issues can be dealt with promptly. Relevant approvals that are critical to move the process forward can be obtained by involving different levels of government officials at distinct stages.
- With respect to the concern for transparency and accountability, performance evaluation of projects on an ex-post basis, along with regular reviews by auditing offices will serve as meaningful measures to make sure that the tendering process is conducted in ethical manners, assuring the general communities' interests.

## 7. Conclusions

The increasing demands for public infrastructure and associated services have posed considerable challenges to governments' budgetary arrangements and capacity for providing quality services. PPPs provide viable options to address the bottleneck by bringing complementary resources and expertise from both public and private sector sides. It has been widely reported that the overall performance of PPP projects is largely determined by the success of the tendering processes. This research therefore aims to identify and compare the critical factors that affect the effectiveness and efficiency of the tendering process of PPPs and propose strategies and measures for enhanced PPP tendering. Through an extensive review of literature and fifteen interviews, this research identifies fourteen critical factors, under seven key dimensions, leading to a successful PPP tendering. An empirical questionnaire survey was conducted in Australia and China to compare the importance of critical factors identified. The statistical analysis suggested that there are significant differences in eight factors between the two countries. Availability sufficient project pipelines and involvement of public officials and leadership are the most important ingredients for successful PPP tendering in Australia and China, respectively.

### 7.1. Research limitations

It is important to acknowledge the limitations of this research. The fifteen interviewees do not exactly mirror the population of they are drawn. The limited number of interviewees arises from the topical issues discussed in this research. Since PPPs are relatively new procurement options, only limited government officials, executives from private

sector entities and experienced PPP advisors have been extensively involved in tendering procedures. Only a small number of individuals are thus capable of providing rich and insightful opinions on the major elements in relation to tendering processes of PPPs.

In addition, only 25 and 32 completed questionnaires were received from Australia and China, respectively, raising concerns about the results' general credibility and wider applicability. In addition to the complexity of issues explored, the sensitivity of the research topics is likely to contribute to the low response rates. The fear for disclosing information, which is of commercial confidentiality or of transparency and accountability concern, may be a reason preventing professionals from participating in the survey. Given the low response from the questionnaire survey, conclusions drawn from the research are indicative rather than conclusive. However, this level of response was considered acceptable for the subsequent analysis and discussion. The findings will be valuable for further explorations in this area.

This research centres on a comparative study of tendering processes of Australia and China's PPP projects. However, the comparison was made based on perceptions and insights of PPP stakeholders from both countries. Since considerable construction management studies were also based on perceptions of experts (Chan et al., 2010a; Zou et al., 2014), such approach is deemed suitable for this research. It should also be noted that the focus on Australia and China gives rise to concern that whether the critical factors identified and the proposed strategies and recommendations can apply to other economic, social and policy contexts.

### 7.2. Contributions and directions for future research

Despite the limited number of interviewees and survey respondents, the findings contribute to practice by identifying critical factors that are specific to PPP tendering processes. Through a comparative analysis of Australia and China, practitioners will be informed of the prioritized considerations when entering into PPP tendering in a free market and a centrally planned economy. This research adds to the international PPP best practices framework by elaborating on the "good practices" for tendering processes. By implementing the strategies recommended, governments embarking on PPP projects will be at a better position to structure and arrange the tendering processes so as to increase the ultimate value for money outcomes. Private sector entities, on the other hand, will increase their readiness in participating in PPPs due to their better understanding of the factors critical to successful tendering practices. PPPs, as sophisticated delivery models, lie within the public sector's procurement range. The strategies and measures for PPP tendering therefore not only serve as important tools for PPP practitioners, but also apply to general construction tendering practices, if tailored to specific contexts. It is hoped that the experiences gained from undertaking PPPs would enhance the public sector procurement as a whole.

Future research, such as incorporating a larger number of stakeholders and covering more construction industries, is

necessary to generalize the findings to the intended population, and to examine how the critical factors affect the performance of PPP tendering. Alternatively, a series of in-depth case studies need to be carried out in the future to verify and enrich the reliability of the critical factors emerged from this research. Considering that the implementation of PPPs would be affected by economic, social and environmental conditions, it is sensible to develop a list of critical factors that can fit specific sectors. Future research, therefore can delve deeper in this topic by taking a sectoral view (e.g. transport, prison and school sectors).

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