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Citation: Wu, Jin, Liu, Henry J., Sing, Michael C.P., Humphrey, Richard and Zhao, Jianfeng (2020) Public-private partnerships: implications from policy changes for practice in managing risks. *Engineering, Construction and Architectural Management*, 27 (9). pp. 2253-2269. ISSN 0969-9988

Published by: Emerald

URL: <https://doi.org/10.1108/ecam-09-2018-0400> <<https://doi.org/10.1108/ecam-09-2018-0400>>

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Public-Private Partnerships: Implications from Policy Changes for Practice in Managing Risks

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Abstract

Purpose – This paper investigates the policy changes made towards infrastructure Public-Private Partnerships (PPPs). The purpose of the study is to empirically identify the policy risks associated with the development of PPPs and to assess their impacts on the projects.

Design/methodology/approach – A case study of the policy changes that have been implemented for PPPs in China over the past seven years has been undertaken and is presented in this study. The Causal Loop Diagrams (CLDs) are applied to assess and illustrate the potential impacts of the risks as a result of such changes on PPPs.

Findings – A sequence of the policy risks, which relate to PPP risk allocation, contract management and implementation, payment and abatement mechanisms and financing, has been identified. It is also found that the identified risks will generate significant but negative impacts on PPPs, leading to an ineffective project delivery, low revenue, poor service quality and even contract breach.

Practical Implications – This research provides the private-sector entities that will embark on PPPs with an insight into managing and controlling policy risks over the project's lifecycle.

Originality/value – PPPs have been critical for infrastructure development worldwide. Nevertheless, they have been a controversy, as many of them were subjected to poor outputs. Consequently, a variety of political mechanisms has been implemented to enhance the governance for PPPs. Policy can bring not only benefits, but also risks and, however, policy risks of PPPs with a particular assessment for their potential impacts have received limited attention. Therefore, the study presented in this paper will contribute to the identification and assessment of policy risks within the context of PPPs.

Keywords: PPPs, infrastructure projects, policy risk, institutional arrangements

Nomenclature

Key Abbreviations	Full Forms and Relevant Definitions
PPPs	Public-Private Partnerships
EIB	European Investment Bank
CLDs	Causal Loop Diagrams
Sign ‘+’ (in CLDs)	Positive impact on PPP projects
Sign ‘-’ (in CLDs)	Negative impact on PPPs project
NDRC	National Development and Reform Commission
MOF	Ministry of Finance
MOT	Ministry of Transport
MWR	Ministry of Water Resources
MHRUD	Ministry of Housing & Rural-Urban Development

PBC	People's Bank of China
DBFO(M)	Design-Build-Finance-Operate-(Maintain) contract
BOT	Build-Operate-Transfer contract
SPVs	Special Purpose Vehicles: Private consortia delivering PPP projects
RF	Risk Factors
RF ₁	Risk Factor 1: Irrational Abatement
RF ₂	Risk Factor 2: Administrative Intervention
RF ₃	Risk Factor 3: Unforeseeable Contract Breach
RF ₄	Risk Factor 4: Lack of Negotiation Mechanism
RF ₅	Risk Factor 5: Inflexible Risk Allocation
RF ₆	Risk Factor 6: Inflexible Payment Mechanism
RF ₇	Risk Factor 7: Decreasing Financial Support from Local Government
RF ₈	Risk Factor 8: Involvement of Social Capital
VfM	Value for Money: Strategic goal of PPPs

Introduction

Infrastructure is pivotal for economic development and social growth in an economy. Public-Private Partnerships (PPPs) have been a vital vehicle worldwide for delivering infrastructure projects. For example, in Australia, a number of social infrastructure assets (e.g. public schools, car parks, stadiums, hospitals and prisons) is being or will be delivered by using PPPs in the states of Victoria, Queensland and Western Australia (WA) (Department of Treasury WA, 2017; Department of Treasury and Finance Victoria, 2017; Queensland Treasury, 2017). Similarly,

there has been a total of 24 infrastructure assets procured via PPPs in the United Kingdom (UK) since 2012 (HM Treasury, 2018). The Chinese central government, additionally, has attempted to enable PPPs to be an integral part of its procurement strategy; thus, infrastructure projects with a total of CN¥11.8 trillion (\approx US\$1.72 trillion) contract values have been finalized to be delivered by using PPPs (The Ministry of Finance China, 2018).

PPPs, however, are currently plagued with controversy, owing to unsatisfactory performance during the initiation and implementation stages, e.g. underestimation or overestimation for local demand for public services, inefficient contract negotiation process and poor service quality (Love *et al.*, 2015). Consequently, many governments have implemented new policies to regulate and govern PPPs in order to enhance their output and outcome quality (Wu *et al.*, 2016). Nonetheless, policy is considered to be a double-edged sword, which can not only bring benefits, but also generate risks (Ferris, 1993). It has been acknowledged that policy risk is one of major risk categories associated with PPP projects, which comprise a sequence of risk factors as a consequence of local policy changes (European Investment Bank – EIB, 2015). Despite this importance, the management of the policy risks of PPPs has received limited attention (Wang *et al.*, 2012; Liu *et al.*, 2018b).

Identifying and assessing risk factors act as the critical stages of *ex-ante* evaluation of PPPs (Grimsey and Lewis, 2002). Moreover, an investigation into the institutional arrangements is an effective way to understand the policy risks of PPPs (Trebilock and Rosenstock, 2015). Against this contextual backdrop, the study presented in this paper is undertaken with an aim

of empirically identifying and assessing the risk factors of PPPs that are originated from a local political system through a comprehensive interpretation of relevant institutional arrangements.

Literature Review: PPPs and Risk Management

Scope of PPP Research

There has been a tendency of governments to embark on PPPs for infrastructure development. This is because of not only their increasingly limited public budgets, but also a number of potential benefits, including: (1) accelerated infrastructure provision; (2) secured timely implementation; (3) reduced life-cycle costs; (4) reduced government improved service quality; (5) improved service quality; and (6) enhanced prudent management of public expenditure and reduced corruption (European Commission, 2003; Liu *et al.*, 2016). Therefore, an inordinate amount of research into PPPs has been conducted, with an emphasis placed on seven common schemes, such as: (1) critical success factors; (2) roles and responsibilities of government; (3) risk management; (4) selection of concessionaire; (5) cost and time efficiency under different types of contract; (6) project finance; and (7) PPP performance measurement (Kwak *et al.*, 2009; Liu *et al.*, 2016; Liu *et al.*, 2018a).

Risk Management of PPPs

As addressed above, risk management is one of the critical topics within the extant literature of PPPs. The origins of the concept of risk management can be traced to B.C. (i.e. more than 2400 years ago), during the period of when Athenians had integrated risk assessment into their decision-making process (Bernstein, 1996). However, risk management has been matured to a

science since the post-*World War II* (Aven, 2016), and it has been widely applied to a variety of fields such as market insurance, financial and property investment and infrastructure development (Dionne, 2013). According to the ISO 3100 and the Institute of Risk Management (2016), risk management is a process of identification, assessment and prioritization of risks. Also, Tohidi (2011) and Aven (2016) has defined risk management as the managerial activities in terms of identifying and assessing risks and reducing their impacts. Under the theoretical system of risk management, risks have been categorised into several groups, e.g. financial, legal, management, market and political (Shen, 2001). Cleden (2009) further identified that risks can be classified into four dimensions, e.g. *known-known*, *known-unknown*, *unknown-known* and *unknown-unknown*.

The extant literature of PPPs is replete with studies that sought to investigate risk identification and allocation (e.g. Grimsey and Lewis, 2002; Thomas *et al.*, 2003; Li *et al.*, 2005; Xenidis and Angelides, 2005; Nisar, 2007; Sachs *et al.*, 2007; Jin, 2011; Xu *et al.*, 2010; Chan *et al.*, 2011). Yet, the research specific for the political risks of PPPs is limited (e.g. Wang *et al.*, 2000; Xenidis and Angelides, 2005; Sachs *et al.*, 2007). Notably, most risks associated with PPPs (including policy risk) are ‘known-unknown’; therefore, risk identification and assessment are essential in managing them (Cleden, 2009). Risk assessment is referred to as an interpretation of potential impacts of the identified risks (Dorfman, 2007). Nonetheless, previous research that has been undertaken to examine the project risks of PPPs focused on risk identification but largely ignored the assessment for the identified risks (Jin, 2011). This has led to an argument of Liu *et al.* (2018a) that the ‘mysteries’ behind the identified risk factors of PPPs (i.e. potential

impacts) have remained unclarified.

As discussed above, an understanding of the policy risks of PPPs needs to be reliant on an analysis of institutional arrangements (Trebilock and Rosenstock, 2015). A plethora of studies has been undertaken to investigate PPPs in terms of institutional issues, e.g. Klijn and Teisman (2003), Petersen (2011), Percoco (2014), Verhoest *et al.* (2015) and Zhang *et al.* (2015). However, such studies pay limited attention to implications behind the identified political risks (i.e. impacts) (Wang *et al.*, 2012; Wu *et al.*, 2016). In addressing this void, this study identifies the policy risks of PPPs and examines their impacts through an interpretation for relevant institutional arrangements.

Methodology

Research Approach

Case study has been used in this study, as it is suitable for all stages of research (e.g., exploration, knowledge generalization and hypothesis testing) (Yin, 2013). Flyvbjerg (2006) supports this perspective by arguing that an individual case is still valuable for the generation of significant knowledge. There is widespread consensus that PPPs implemented in developing countries are subjected to a greater policy and/or legal risk (World Economic Forum, 2005). Thus, the case study presented in this paper concentrated on the institutional arrangements for PPPs in China, attempting to identify the impacts of all regulations and by-laws that have been implemented over the past seven years by the National Development and Reform Commission (NDRC), Ministry of Finance (MOF), Ministry of Transport (MOT), Ministry of Water Resources

(MWR), Ministry of Housing and Rural-Urban Development (MHRUD) and People's Bank of China (PBC). The reason for studying such regulatory and legal changes in this research is because they were enacted by the main departments of the Chinese central government that are responsible for the governance of PPP sector in China. An investigation into the policies that were launched by aforementioned departments can better capture the Chinese government's expectation on and strategies towards PPPs and then enable the future projects to be delivered more efficiently through the design of a sound mechanism for risk identification and allocation (Wu *et al.*, 2016).

A variety of economic and social infrastructure assets in China has been procured by using DBFO (design-build-finance-operate) or BOT (build-operate-transfer) contracts since the 1980s, for example, *Beijing Underground Line 4*, *Hangzhou-Taizhou High Speed Rail* and *Guangzhou Xilang Wastewater Treatment Plant* (Chan and Cheung, 2014). Hence, a study of China's PPP institutional arrangements can also provide an insight into the policy risk management of both economic and social infrastructure PPPs (Wang *et al.*, 2012). Moreover, research on China's business environment of PPPs (e.g. political, economic, social and technical) is significant, as its PPP market is rapidly developing and sophisticated; lessons learned from it are valuable for improving the delivery of PPP projects in developing world (Wu *et al.*, 2016).

Data Sources and Causal Loop Diagram

Documentary sources (e.g. legal documentations, governmental and consultancy reports) that are published and provided by the departments of China's central government, such as NDRC,

MOF, MOT, MWR, MHRUD and PBC, have been used as the data for the identification and assessment of PPP policy risks. It is stated above that the technique of *Causal Loop Diagram* (CLD) is applied to assess and illustrate the impacts of the identified risks on the delivery of PPP projects. The CLD incorporates “cause” and “effect” variables, which are connected by arrows denoting their causal relationships. Each causal link is assigned a polarity, either positive (+) or negative (-), to indicate the relationships (i.e. positive or negative) between critical factors/elements that are being observed. Therefore, it has been widely applied in construction management studies, including PPPs, e.g. Yuan and Wang, 2014; Sing *et al.*, 2016; Sing *et al.*, 2019; Yuan *et al.*, 2019. The CLDs developed in this study are robust in providing the decision makers of private entities that will be or are embarking on PPPs with a consolidated assistance in understanding how to effectively hedge or manage political risks to enable project success.

Case Study: Institutional arrangements for PPPs in China

Pilot and Development Phases

The institutional arrangements for PPPs in China can be dated back to the 1980s. There was a total of three phases of the Chinese PPP institutional arrangements throughout the past three decades. In the Pilot/Initial phase, which is referred to the period from 1983 to 1999, the focus of the institutional arrangements for PPPs was focused on attracting international capital investment for China’s infrastructure development. The policies and their relevant laws and regulations made for PPPs within the 1980s and the 1990s in China had been criticised as being “informal”, “confusing” and “controversial”, as neither the central nor local governments were experienced in PPP delivery (Williamson, 2000).

This circumstance had been gradually improved between 2000 and 2012, which are known as the *Development Phase* of the Chinese institutional arrangements for PPPs. A ‘top-down’ promotion for PPPs was initiated by the *State Council* (i.e. the chief authority of China) in the post-2000 era, during of when policies and relevant by-laws and regulations at both ministerial and provincial levels were enacted across the country (Zhang *et al.*, 2015). As stated by the NDRC (2017), there were many policy gaps of PPP implementations within China’s political system (e.g. contract management, government’s roles and responsibilities and payment mechanisms); thus, industrial practitioners (particularly legal advisors) had to be ‘travelling’ across such ‘grey areas’ during the delivery processes of PPPs. At these awkward, private investors have been subjected to huge policy/legal risks over the past decades in China.

Recent PPP Institutional Arrangements

The business environment of PPPs in China has been substantially changed since 2013. The Chinese governments at different levels, as mentioned above, have designed and implemented a strategic plan to integrate PPPs into their infrastructure procurement strategy. As a result, a series of PPP institutional arrangements was initiated by the departments of central government, for example, State Council, NDRC, MOF, MOT, MWR, MHRUD and PBC (i.e. the Chinese central bank). Table 1 summarises the PPP institutional arrangements conducted throughout the past seven years in an ascending chronological order. Notably, the regulations and by-laws indicated in Table 1 were enacted with an aim of governing the contract development and management of PPPs. Therefore, they are expected to bring impact on some specific areas in PPP delivery, such as risk allocation, payment mechanism and abatement, contract negotiation,

contract termination and financial subsidy provided by government.

Table 1. PPP institutional arrangements of China between 2012 and 2018

Issuing Party	Time	By-laws/Regulations	Summary of Key Perspectives
Communist Party of China	12/Nov/2012	Major Issues Concerning How to Deepen the Comprehensive Reform	<ul style="list-style-type: none"> • Allow social capital to financing social infrastructure projects
State Council	06/Sep/2013	Advice on Improving Social Infrastructure	<ul style="list-style-type: none"> • Governments focus on non-marketable infrastructure projects, while private capital focuses on marketable projects;
State Council	21/Sep/2013	Opinion of Strengthening Debt Management of Local Governments	<ul style="list-style-type: none"> • Advocate PPP approach; • Risk allocation: investors are responsible for project financing while governments are responsible for permitting, pricing and financial subsidy; • Demand-based model is preferred; • Financial subsidy for PPPs can be provided by using public budget; • No income guarantee for concessionaire.
MOF	23/Sep/2014	The Circular on Promoting Cooperation between the Governments and Social Capital	<ul style="list-style-type: none"> • Attempt to define PPPs in China; • Risk allocation: private sector is responsible for design, build, operation and maintenance, while public authorities take the responsibilities in governing price and service
State Council	16/Nov/2014	Opinion of Encouraging the Innovation of Investment and Financing Mechanism	<ul style="list-style-type: none"> • Encourage delivery of infrastructure projects through PPP in some key areas, e.g., environment protection, agriculture, social infrastructure, transportation, energy facilities, information infrastructure, etc.

MOF	29/Nov/2014	Guideline for the Mode of Cooperation between the Governments and Social Capital	<ul style="list-style-type: none"> • Providing governments with a guideline during the PPP development process, e.g., project identification, preparation, procurement and transfer
MOF	30/Dec/2014	The Circular for Standardizing the Administration of Cooperation between the Governments and Social Capital	<ul style="list-style-type: none"> • Providing for a guideline to procuring infrastructure assets/facilities via PPPs (trial version)
NDRC	02/Dec/2014	Opinion on Promoting Cooperation between the Governments and Social Capital	<ul style="list-style-type: none"> • Providing for a guideline about how to encourage more social capital to participate in developing infrastructure and providing public services
NDRC	02/Dec/2014	Guiding Opinions on Implementing Public-Private Partnerships	<ul style="list-style-type: none"> • Providing a guideline about how to contracting PPP projects
MOF	31/Dec/2014	Regulation on Government Procurement in Government-Social Capital Cooperation Projects	<ul style="list-style-type: none"> • Regulating the infrastructure procurement by using PPPs integrated with social capital
MOF	7/Apr/2015	Guidance for Assessing Finance Bearable Capability of Government/social Capital Projects	<ul style="list-style-type: none"> • Annual expenditure for PPP projects should not exceed 10% of the government's annual budget
NDRC/MOF/MHRUD/MOT/MWR/PBC	25/Apr/2015	Management Measures for Concessionaire in Infrastructure and Public Utilities	
MOF	13/Oct/2016	Facilitating PPPs in Procuring Social Infrastructure Assets	<ul style="list-style-type: none"> • Enhancing the use of PPPs in social infrastructure areas; • Further decrease in financial subsidy; and

MOF	6/Jun/2017	Facilitating PPPs in Delivering the Projects of Architectural Infrastructure	<ul style="list-style-type: none"> • Introducing more different types of ‘social capital’ into future projects • Appropriate risk allocation with permission for governments to be the shareholder of the Special Purpose Vehicle; • Strict management of public debit and assessment for value for money; and • Rigorous performance measurement implemented to ensure a better output of the project
MOF/Ministry of Civil Affairs/Ministry of Human Resources and Social Security	21/Aug/2018	Guideline for applying PPPs to support the Development of Aged Care Facilities	<ul style="list-style-type: none"> • Legally and appropriately shortlisting preferred ‘social capital’; and • Appropriate selection of a payment mechanism with a preference to user-charge regime

PPPs, obviously, have been applied in a variety of areas in China to develop urban and regional infrastructure. Compared with the institutional arrangements initiated before 2012, the by-laws and regulations of PPPs enacted after 2012 are more detailed, explicit and specific, covering the issues cascading down from risk allocation and governance to scope definition. The aim of PPP institutional arrangements throughout the past seven years was to stipulate what PPP is within the context of Chinese political systems and then provide for a general guideline about how to implement PPPs, e.g. risk allocation, governance and financial subsidy, which will be discussed further in the following sections.

Key Perspectives of Post-2012 Institutional Arrangements for PPPs in China

Definition and Scope of PPPs in China

Various definitions of PPPs can be noted in the literature. The European Investment Bank (EIB) (2004) defines that PPPs are the “relationships formed between private sector and public bodies with the aim of introducing private sector resources and/or expertise in order to provide and deliver public sector assets and services” (p.2). The Public Private Infrastructure Advisor Facility (PPIAF) (2014) suggests that a PPP “involves the private sector in aspects of the provision of infrastructure assets or of new or existing infrastructure services that have traditionally been provided by the government.” In essence, “there is no universally accepted definition of a PPP and its meaning differs between countries” (Liu *et al.*, 2018a).

PPPs have been applied in China for more than three decades and, however, its meaning is still ambiguous. The NDRC (2013) states that it is legally essential to clarify the concept of PPPs in the context of China, because this can enable PPP implementations to accommodate well the Chinese political systems. A “milestone” documentation, entitled “*The Circular on Promoting Cooperation between the Governments and Social Capital*”, was issued by the Chinese Ministry of Finance in order to define PPPs and their scopes. Although this official document was written in Chinese, the original English terminology, “Public-Private Partnerships”, was adopted throughout the main body of text to explain what PPP is. In view of this, the definition of PPPs within the Chinese context is similar to those of EIB and PPIAF; however, the scope has been extended from an involvement of private-sector resources to an inclusion of “social capital”.

“Social capital” is a terminology specific for China’s market economic system, in which private sector is comprised of the enterprises that are not only privately owned, but also state-owned and joint-owned (by public authority and private entity). Such companies with the “state” background but operating in the private sector in China are referred to as the market-oriented state-owned corporations. With this in mind, social capital in China is defined as the “capital money” originating from the entire private sector. Thus, PPPs within China are also considered to be *Government-Enterprise Partnerships* (Mu *et al.*, 2010; Zhang *et al.*, 2015).

Priority for the Demand-Based Model

Based on payment mechanisms, there are two types of PPPs, e.g. the availability-based and the demand-based models. Under the availability-based model, “government retains demand risk and the main form of revenue for the *Special Purpose Vehicles* (SPVs) is therefore the regular service payment received from public authority for making the asset available and providing the services to the required performance standard” (The Treasury NSW, 2015, p.2). By contrast, the demand-based PPPs are implemented by transferring demand risks to the SPVs; therefore, the private-sector entities actually operate the assets for the purpose of generating profits. In other words, the revenues of the assets are yielded by charging the third parties (i.e. end-users) rather than regularly receiving service payments from public-sector partners (The Treasury NSW, 2015). According to the official documents issued in the post-2012 institutional arrangements (Table 1), the demand-based PPPs have been stipulated as the preferred model for future infrastructure development in China within the long-run context, though limited availability-based PPPs might be allowed.

Regulated Risk Allocation

During the early stages of promoting PPPs, local governments in China have “myopia” to introduce private capital investment into infrastructure development, excessively offering favorable terms to private investors (Zhang *et al.*, 2015). This led to inappropriate risk allocations that acted as a trigger for producing extensive disputes and/or contract breaches (Wang and Ke, 2008). As a consequence, the central government, in the post-2012 round of institutional arrangement for PPPs, enacted regulations and rules specific for risk allocation, aiming to legally specify the roles and responsibilities of the involved parties.

The by-laws and regulations, for example, “*The Circular on Promoting Cooperation between the Governments and Social Capital*” and “*Opinion of Strengthening Debt Management of Local Governments*”, legally advised that private entities participate in infrastructure delivery by handling the design, construction, operations, maintenance and partial financing, while governments should be responsible for licensing, determining (pricing) user charges, governing, measuring and monitoring service performance and providing for subsidy (if necessary). It is also required that the demand risks of PPPs need to be transferred to private-sector entity, and public authority is prohibited from granting a minimum income guarantee or debt repayment for the proposed arrangements.

Limited Subsidy from Local Governments

An impressive feature of current PPP policy and regulations in China is relating to the financial liability of the involved local governments. As noted above, priority has been given to the use

of the demand-based PPPs in the future in China. Due to the oversupply of subsidy, the Chinese public budget available for infrastructure development has become more and more limited and some local governments have even been subjected to financial burden. With this issue, it has been stipulated that no more than 10% of the annual budgets of the Chinese local governments can be granted to provide the proposed PPPs with financial assurance or attract more private contractors so as to enhance the competitiveness of the tendering processes (i.e. *Guidance for Assessing Finance Bearable Capability of Government-Social Capital Projects*).

Current Policy Gaps of PPPs in China

The institutional arrangement for PPPs in China is an on-going process, though a sequence of works has been completed to regulate delivering infrastructure projects via PPPs. The documents published by the NDRC (2017) indicate that China lacks a national guideline to fully support and guide the implementations of PPPs and there are several policy gaps to be urgently filled, involving: (1) the measurement and monitoring of operational performance of the built asset; (2) the nature of PPP contract; and (3) contract negotiation.

Performance measurement plays a decisive role throughout the project lifecycles of PPPs. Liu *et al.* (2018a) identify that an ineffective measurement has contributed to the unsatisfactory performance of PPPs (e.g. cost overrun, time overrun and poor service quality) over the past decades. The current practice in performance measurement in PPPs is focused on the operation of the asset (Liu *et al.*, 2016). Noteworthy, measuring and monitoring performance are key activities of contract management, which is regulated by national PPP guidelines and/or policies

in most developed economies (e.g. Australia and the UK) (Chinyio and Gameson, 2009; HM Treasury, 2013). However, there is lack of policy and regulations stipulating or guiding how to measure and control the operational performance of PPPs in China (NDRC, 2017).

The nature of PPP contract, additionally, is ambiguously defined within China's political and legal systems. Consequently, the local governments in China tend to consider the contract of PPPs to be an administrative stipulation, rather than a business service agreement (NDRC, 2017). Further, "prohibition for contract negotiation during tendering" is one of administrative principles of government procurement in China. This undermines the theoretical and practical bases of PPPs, which focus on contractual partnership, rather than 'order-taking' relationship.

Results and Findings: Policy Risk Factors

The institutional arrangements for PPPs have contributed to the development of China's PPP industry since the 1980s. Accordingly, a total of eight policy risk factors (RF) of delivering PPPs in China can be identified (e.g. RF₁ to RF₈) from an interpretation of the Chinese institutional arrangements demonstrated above. Figure 1 illustrates the identified risks such as *irrational abatement regime, administrative interventions, inflexible risk allocation and involvement of market-oriented state-owned contractors* (i.e. social capital).

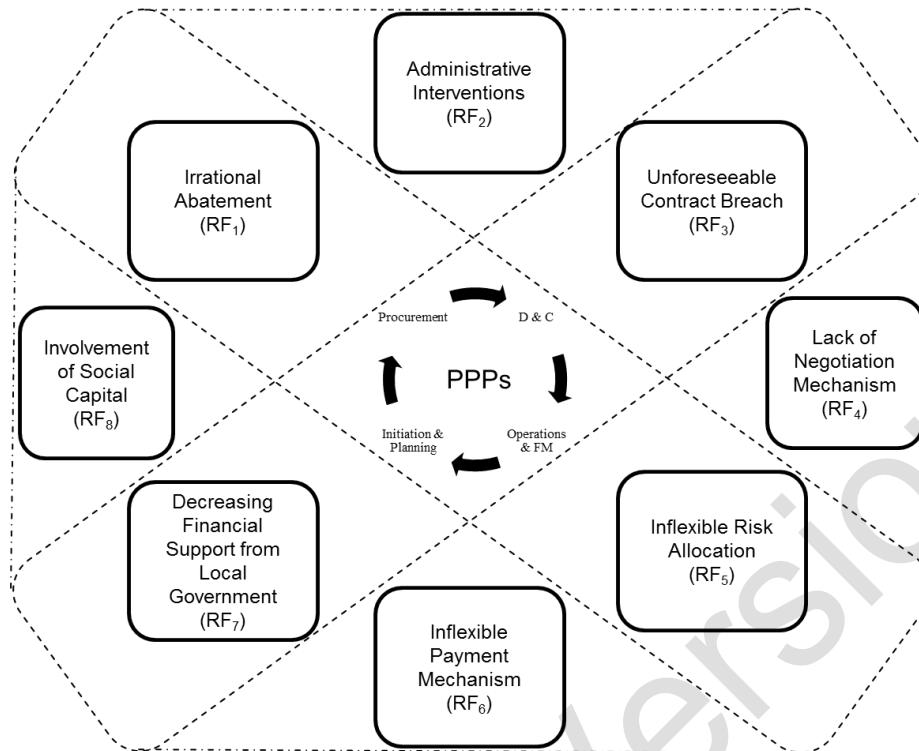


Figure 1. Policy risk factors associated with PPP delivery within China's political system

Discussion

Impacts of RF₁, RF₂, RF₃ and RF₄ on PPPs

It is identified from Figure 1 that such identified risk factors as RF₁, RF₂, RF₃ and RF₄ can be categorized as being within the area of PPP contract management. Accordingly, a CLD was developed as Figure 2 to assess and illustrate the potential impacts of aforementioned risk factors (e.g. RF₁, RF₂, RF₃ and RF₄) on the delivery of PPP projects.

Essentially, the Chinese political and legal systems, as interpreted above, is not only failing in guiding how to measure and monitor the operational performance of the assets, but also is ambiguous for the nature of PPP contract. Consequently, most local governments in China misperceive that a PPP service agreement is of an administrative stipulation that is formed for

a purpose of dealing with public financial burden. The NDRC (2017) states that due to a misunderstanding or misperception of the legal nature of PPP contract, some public authorities that embarked on PPPs in China unreasonably violated contractual arrangements, resulting in substantial loss of private-sector entities. For example, private financiers (i.e. commercial banks) in China tend to financing PPPs through a provision of secured loan and, therefore, they prefer to involve local governments for assurance and consider that this can enhance loan security. A number of the assured contracts, however, was breached by the Chinese local governments themselves because of unreasonable administrative mechanisms for adjustment (Wang *et al.*, 2016).

The majority of the Chinese local governments, therefore, are not acting as a ‘governor’ and ‘partner’, but a “dominator” (i.e. Figure 2: “Dominant role of government”), throughout the lifecycle of PPPs. As a result, they rely on administrative interventions (RF₂) (i.e. Figure 2: causal effect (+) from ‘Dominant role of government’ to “Administrative Interventions (RF₁)”), rather than a professional contract management mechanism, to monitor PPP delivery. Based on Figure 2, an irrational abatement regime (RF₁) can be triggered by such aforementioned administrative interventions (i.e. Figure 2: causal effect (+) from RF₂ on RF₁), and it can lead to local government’s full control over the project’s lifecycle of a PPP (i.e. Figure 2: causal effect (+) from RF₁ on “Control by the local government”). As a result, harsh key performance indicators (KPIs) may be implemented by the governments, which will undermine the appropriateness of the system developed to legally govern the operational outputs of the assets (i.e. Figure 2: causal effects indicated by ‘+’ and ‘-’ from “Control by the local government” on

“Harsh key performance indicators” and then from “Harsh key performance indicators” on “Legal guide for operational performance”, respectively).

An “irrational abatement regime (RF₁)” caused by the dominant role of public sector can not only damage the delivery effectiveness and service quality of a PPP project (i.e. Figure2: causal effect (-) from RF₁ on “Effectiveness of the project output”), but also aggravate the issue with a negotiation between public and private sectors during the procurement stage (i.e. Figure 2: causal effect (-) from “Irrational Abatement Regime (RF₁)” on “Negotiation Mechanism (RF₄)”). More importantly, there is an unavailability of negotiation mechanism legally designed for government procurement in China (NDRC, 2017). Without a formal and effective negotiation mechanism (RF₄), private-sector entities that are keen in participating in public services in China will have to unconditionally accept the ‘unfair regime’ (i.e. harsh KPIs) to ensure the contracts to be awarded. Such private consortia then will have to bear all commercial risks after the contract and financial closes of the PPPs and be subjected to a high possibility of failure in meeting all KPIs (i.e. Figure 2: causal effects (+) from “Harsh key performance indicators” and “Negotiation Mechanism (RF₄)” on “Private sector needs to bear all commercial risks”). Hence, contract breach or termination (RF₃) may occur, bringing potential negative impacts on the output and long-term success of a PPP project (i.e. value for money – VfM) (i.e. Figure2: causal effects (“+” and “-”) from “Unforeseeable Contract Breach (RF₃)” on “Termination of the contract” and on “Effectiveness of the project output”) (see Figure 2 below).

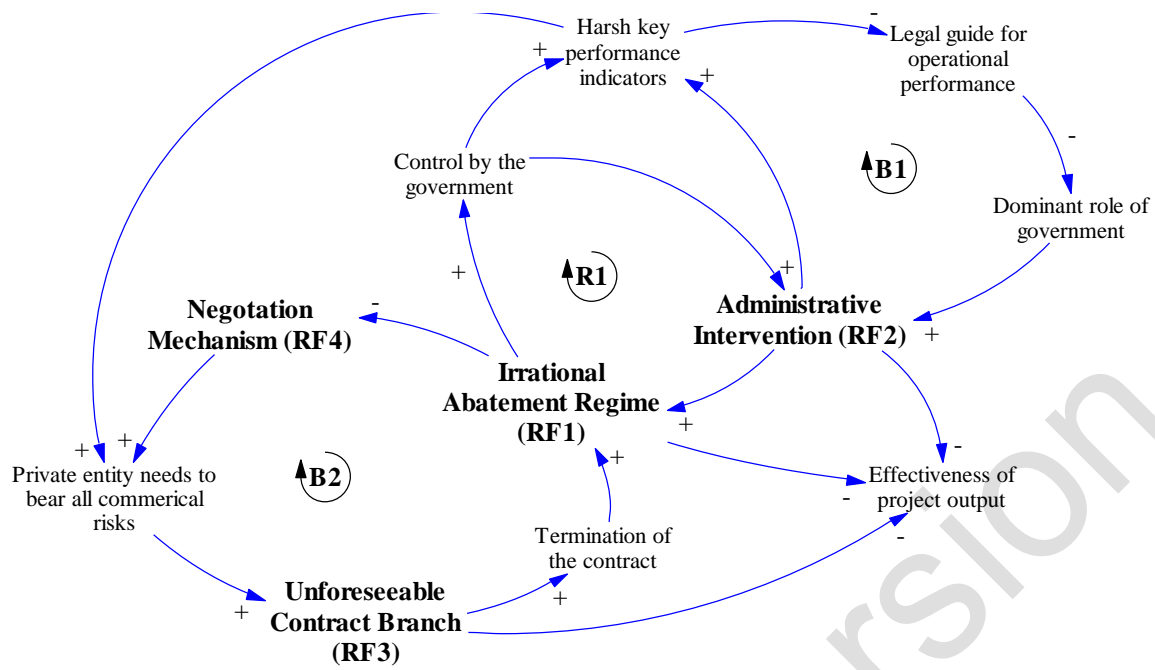


Figure 2. Causal loop diagram of the risk factors of R₁, R₂, R₃ and R₄

Note: [B1] Dominant role of government → (+) Administrative Intervention (RF2) → (+) Harsh key performance indicators → (-) legal guide for operation performance.

[R1] Irrational Abatement Regime → (+) Control by the government → (+) Administrative Intervention (RF2)

[B2] Irrational Abatement Regime → (-) Negotiation Mechanism (RF4) → (-) Private entity needs to bear all commercial risks → (+) Unforeseeable Contract Branch (RF3) → (+) Termination of the contract

Impacts of RF₅ and RF₆, RF₇ and RF₈ on PPPs

As what is shown in Table 1, a series of policies and relevant by-laws or regulations was enacted between 2012 and 2014 in China in order to stipulate how to implement risk allocation and select PPP model and to regulate the subsidy provided by local governments. The purpose of these institutional arrangements is for defining the scope of PPPs in the context of China and then enabling PPPs to be integrated into the Chinese political/legal systems. Notwithstanding, a total of four risk factors relating to PPP risk allocation and payment mechanisms (e.g. RF₅,

RF₆, RF₇ and RF₈) can be triggered by the enactments of such policies. Based on these identified factors, a CLD (i.e. Figure 3) was developed to examine and indicate how they will be affecting the implementations and long-term outputs of PPPs.

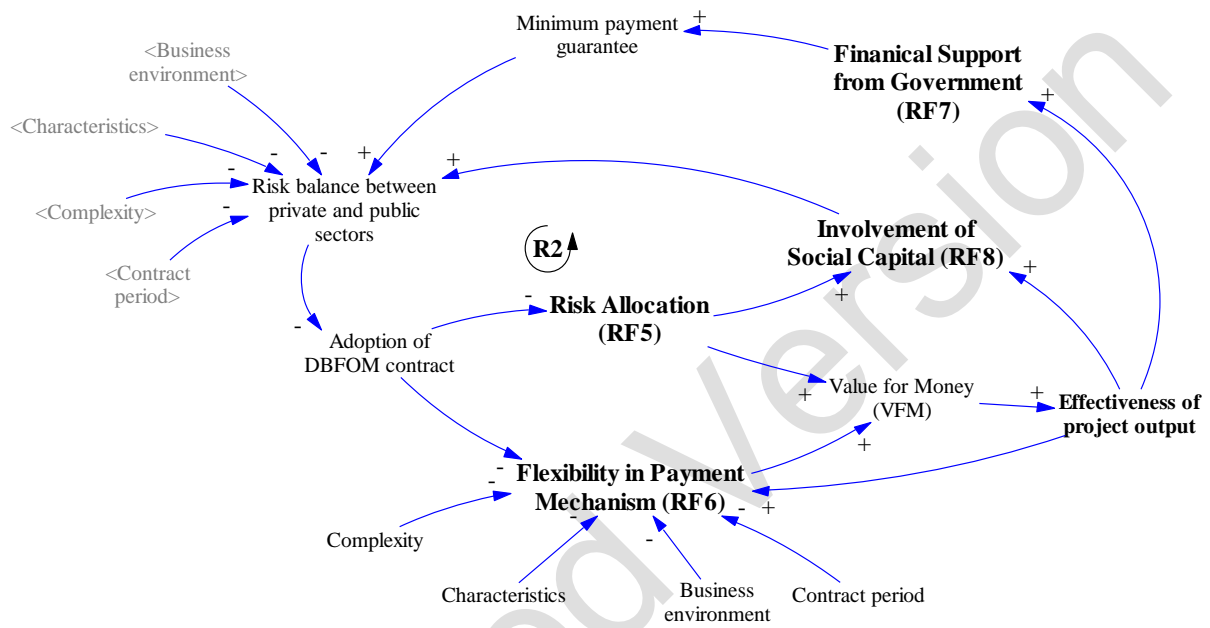


Figure 3. Causal loop diagram of the risk factors of R₅, R₆, R₇ and R₈

Note: [R2] Characteristics, complexity, contract period and business environment → (-) Risk balance between private sector and public sectors → (-) Adoption of DBFOM contract → (-) Risk Allocation (RF₅) → (+) Involvement of Social Capital (RF₈)

Optimum risk allocation and appropriate selection of a payment mechanism (e.g. availability-based and demand-based) have been acknowledged as being critical to the project success of PPPs (Figure 3: causal effects (+) from “Risk Allocation” and “Flexibility in Payment Mechanism” on “Value for Money (VfM)”) (Jin, 2010; Jin and Zhang, 2011). A principle for appropriately allocating risks and selecting a payment mechanism (i.e. the availability-based or

demand-based) within a PPP depends on the project's: (1) characteristics; (2) complexity; (3) business environment (i.e. uncertainty); and (4) contractual period (Liu *et al.*, 2015b; Love *et al.*, 2015; Liu *et al.*, 2018b) (Figure 3: causal effects (-) on “Risk balance between private and public sectors” and “Flexibility in Payment Mechanism”). According to the EIB (2015) and the Department of Treasury WA (2017), risk allocation and payment-regime selection are sophisticated processes essential for achieving VfM over the lifecycle of PPPs. Normally, the availability-based payment mechanism is used for social infrastructure PPPs (e.g. prison, hospital and school), while economic infrastructure PPPs (e.g. road, tunnel and light rail) are delivered by adopting the demand-based regime. For example, the *Eastern Goldfield Regional Prison* and *Midland Health Campus* in WA, Australia, are PPPs using DBFM (design-build-finance-maintain) and DBOM (design-build-operate-maintain) contracts supported by the availability-based payment. By contrast, the *Beijing Underground Line 4* is being operated with a demand-based (i.e. user-charge) mechanism.

The Chinese policies as a result of current institutional arrangements, however, have stipulated that the procurement of infrastructure assets through the use of PPPs, regardless of social or economic infrastructure, should rely on DBFOM contract underpinned by the demand-based (user-charge) payment mechanism (Figure 3: causal effect (-) from “Risk balance between private and public sectors” on “Adoption of DBFOM contract”). This implies that the risk allocation and payment mechanism of PPPs in China have been legally fixed (Figure 3: causal effects (-) from “Risk balance between private and public sectors” on “Risk Allocation” and “Flexibility in Payment Mechanism”), leading to that private-sector entities should have to bear

all commercial risks, no matter what types of infrastructure projects are being delivered. With these inflexible processes of risk allocation (RF₅) and payment regime section (RF₆), the private entities to be involved with PPPs in China will confront not only such supply risks as construction time/cost overruns and the unavailability of financing (i.e. the collapse of financial market), but also the demand risk of insufficient user volumes. These will engender severe impacts on PPPs, for example, profit loss, below optimum service and underachievement of VfM (Figure 3).

Furthermore, it is a legal requirement in China that the pricing mechanism, which is a critical component of the payment regime of PPPs, is fully controlled by the local governments. In other words, the user charge of the asset and its future adjustments must be determined by the involved public authorities. This is also considered to be a risk for private sector, in terms of the flexibility of payment regime of PPPs (RF₆). Although the government is the owner of public asset that supplies service in a DBFOM-based PPP, the private SPV is the only key stakeholder who owns the resources to deliver the project and is sensitive to demand-side change. It is knowledge that commodity or service price needs to be determined by the equilibrium of demand and supply sides of the market. Hence, isolating private-sector entity from the decision-making process of the asset's user charge adjustment in a PPP will be harmful for the revenue and VfM.

EIB (2015) suggests that to secure a long-term success the demand risk of PPPs should be at least partially beyond the control of private entity; thus, suitable mechanisms, especially

minimum payment guarantee, need to be implemented to enable some of the demand risk to be away from private sector (Figure 3: causal effect (+) from “Minimum payment guarantee” on “Risk balance between private and public sectors”). This perspective is supported by the PPIAF (2017), which suggests that “if those user charges are insufficient to meet the private partner’s costs and provide a return on its investment (that is, the project is not commercially feasible and there will be a viability gap), the government can assign the user payments to the private partner and supplement the user charges with government payments to fill the viability gap” (Figure 3: causal effect (+) from “Financial Support from Local Government (RF₇)” on “Minimum payment guarantee”). However, the subsidy provided for the demand-based PPPs in China is decreasing (i.e. RF₇ in Figure 3) and has been limited to 10% of the annual public budget of local governments. Essentially, the regime of supplementing PPPs with a direct payment of local government to concessionaires has been gradually eliminated from China’s infrastructure procurement system. As identified above, minimum revenue guarantee from public authority is now unlawful in China. Consequently, private entity will have to be exposed to a greater demand risk in the delivery of PPP projects in China, possibly causing a lower profit during the asset’s operations and eventually bringing substantial negative impacts on the provision of V_M to taxpayers.

The scope of PPPs in the context of China has been legislatively extended from an involvement of private resources to social capital, which covers the money or resources of both purely private and the market-oriented state-owned organisations (Figure 3: causal effect (+) from “Risk Allocation” on “Involvement of Social Capital”). An introduction of the concept of social

capital can enable PPPs to be legally embedded into China's political system (see MOF's by-laws/regulations listed in Table 1). In essence, the 'private-sector organisations' completely or partially owned by the state are consuming public resources and are managed by the governments in nature. With this issue, the public clients of PPPs in China prefer 'private-sector' contractors that have state ownership to build the assets (Figure 3: causal effect (+) from "Involvement of Social Capital" on "Risk balance between private and public sectors"), as they consider that purely privately owned contractors are not robust enough to complete the construction of the assets on time, on cost and on quality.

Beijing Underground Line 4, for example, has been claimed as a successful PPP by China's central government. This urban rail PPP project is under the DBFO contract with the demand-based payment regime; however, 70% of the financing was provided by a state-owned capital investment group and the construction work was required to be subcontracted back to a state-owned contractor after the financial close (Wu *et al.*, 2016). As a result of involving the market-oriented state-owned companies into PPPs, the 'space' for the purely private entities to manage or operate the assets will be substantially compressed (i.e. "Risk balance between private and public sectors" as illustrated in Figure 3). Notably, there has been a common issue that the Chinese state-owned companies are subjected to low efficiency and bureaucracy. Therefore, an involvement of "social capital" (RF₈) may make the privately owned organization involved with PPPs in China confront a number of problems, e.g. ineffective use of resources, inefficient dispute resolution and poor inter-organization communication, which may affect the V/M and effectiveness of the project as illustrated by the second CLD (Figure 3).

Conclusions

PPPs have been widely used for delivering infrastructure projects. However, many unsuccessful deliveries were reported and a plethora of studies has been conducted to investigate the risks of the projects. Despite this, the research on policy risk and their impacts on PPPs is limited in extant literature, especially within the context of developing countries. Bearing this perspective in mind, a case study of China's institutional arrangements has been undertaken with an aim of: (1) identifying the risks resulting from local changes of policies and regulations; and (2) exploring how they can affect the delivery of PPP projects.

Based on the documentary sources of the departments of China's central government, a number of policy-risk factors (e.g. irrational abatement regime, administrative interventions, unforeseeable contract breach, inflexible risk allocation, inflexible selection of payment mechanism, decreasing financial support from local governments and involvement of social capital) has been identified. Accordingly, the CLDs were applied to interpret the impacts of the identified risks on PPPs. The developed CLDs indicate that policy risks, e.g. administrative intervention, irrational abatement regime, inflexible risk allocation and decreasing financial subsidy, will be able to significantly impact the output and outcome quality of PPPs.

The empirical study presented in this paper is theoretically significant, as it contributes to the literature by identifying the policy risks relating to PPPs as well as their potential impacts. Apart from this, the research outputs of this paper were derived from practice and thus are practical. The CLDs developed provide the private-sector entities of PPPs with valuable implications that

are useful for effective management and control of policy risks, particularly those relating to the contract management and risk allocation of the projects. They can act as a solid base to design appropriate strategies or a sound mechanism to prevent future risks in regard to contract negotiation/management and then to identify risk appetite for the projects, ensuring a successful participation to infrastructure public services.

In addition, this research is significant for public authorities that are embarking on or will embark on PPPs. For example, the developed CLDs can serve to visualize the negative impacts of the implemented policies on future PPPs. This can lead to an improved policy development in the future through a better understanding of current policies, enabling a more effective policy decision-making of government that aims to ensure an efficient governance for urban and regional infrastructure development via PPPs. However, an emphasis will be needed in future research, concentrating on a further quantitative testing that validates the implications produced by the developed CLDs by examining the identified risks and their impacts using nationwide data.

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