RISK EVALUATION AND MITIGATION STRATEGIES FOR CHINESE INVESTMENTS IN OVERSEAS PUBLIC-PRIVATE PARTNERSHIPS

By

Miss Min YANG

A Thesis Submitted in Partial Fulfillment of the Requirements

for Master of Engineering ENGINEERING MANAGEMENT

Department of INDUSTRIAL ENGINEERING AND MANAGEMENT

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Title	Risk Evaluation and Mitigation Strategies for Chinese Investments in Overseas Public-Private Partnerships
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The thesis, grounded in the backdrop of the Belt and Road Initiative (BRI), a global development strategy launched by China in 2013, highlighted the critical role of PPPs in mobilizing private capital and expertise for infrastructure projects. It emphasized the need for careful planning, comprehensive risk assessment, and strong partnerships underpinned by mutual trust and a shared vision to overcome challenges presented by the global and complex nature of PPPs in the BRI context. These challenges include managing projects across multiple nations, navigating differences in legal and regulatory frameworks, disparities in economic development, and cross-cultural communication barriers. This research delved into various risk categories integral to the practicality of BRI-PPP projects, including political, economic, social, geographical, operational, technical, and legal risks. Significant emphasis was placed on political, economic, and social risks, while also acknowledging the importance of not underestimating technical risks and emergency planning strategies. The case study, analyzing five representative cases, illustrated the influence of varied risk factors and the importance of strategic alignment with local contexts, international relations, and comprehensive stakeholder engagement. Stakeholder Theory and Risk Management Theory was applied, bridging theoretical analysis with real-world implications and emphasizing these frameworks' utility in managing the diverse landscape of international PPP projects. This study offered a holistic approach that combined theoretical insights with practical applications, providing a strategic roadmap for stakeholders, practitioners, and policymakers engaged in international PPPs. It underscored the necessity of proficient management of political and economic uncertainties and addressed the significance of technical, operational, social, and environmental factors in project success. The result of this study contributed substantively to the body of knowledge in PPP risk management and proposed a paradigm for resilient and sustainable infrastructure development on a global scale.

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Min YANG

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CHAPTER 1
INTRODUCTION

1.1 Research Background

Public-Private Partnerships (PPPs) are broadly defined as a symbiotic relationship between the public and private sectors. They are an agreement where both parties bring their strengths to the table to enhance public infrastructure or services (The World Bank, 2022).

Due to fiscal constraints, the PPPs have grown popular, particularly for executing public infrastructure projects. For governments, the PPPs offer the possibility of leveraging private sector efficiencies and innovations, delivering superior infrastructure and services without overextending public finances (Iossa & Martimort, 2015). Risk sharing is another potential benefit, with certain operational, financial, and technical risks transferred to the private sector, which may be better positioned to manage them (The World Bank, 2022). For the private sector, the PPPs provide opportunities to participate in large-scale public projects that can provide stable, long-term returns on investment. This can contribute to portfolio diversification and offer avenues for showcasing innovation and technical prowess (Iossa & Martimort, 2015).

In 2013, China launched the Belt and Road Initiative (BRI), a global development strategy. The BRI involves an enormous undertaking of infrastructure development, connecting Asia with Africa and Europe through extensive land and maritime networks. Currently, China's international engineering construction projects are primarily driven by funding, which is common in regions benefiting from the BRI. Among them, the PPPs are the most common investment and construction method.

In 2022, the BRI is encompassing 151 countries and 32 international organizations, accounting for 32.9% of the total value of China's foreign trade in imports and exports (Niu & Yang, 2023). The initiative targets enhancing regional connectivity and promoting economic growth through numerous infrastructure projects, including highways, railways, airports, ports, power plants, and telecommunication networks. Given the substantial capital requirements of such

undertakings, China has acknowledged the importance of engaging the private sector to supplement public funds, thus establishing a vital role for PPPs within the BRI framework (Zhang et al., 2016).

The fundamental premise of utilizing PPPs in the BRI is to mobilize private capital and expertise for these infrastructure projects. This strategy does not only share the financial responsibility but also harnesses the innovation and efficiencies of the private sector, augmenting project outcomes (Zhang et al., 2016). Moreover, the risk-sharing characteristic of PPPs offers particular benefits within the BRI context, given the high-risk nature of many of the projects involved, often resulting from geographical complexities, political instabilities, or market uncertainties in certain BRI countries.

Public-Private Partnerships also serve to foster cooperation and mutual understanding among BRI countries. As a collaborative model, PPPs necessitate active participation from various stakeholders, including governments and businesses from multiple countries. It allows for cross-cultural interactions and knowledge exchange, thereby enhancing mutual understanding and collaboration. Additionally, it helps in aligning the objectives of multiple stakeholders towards common developmental goals, a key aspect for successful BRI implementation.

However, oversea PPPs also face challenges. Managing one PPP project within one single country is complex enough, but doing so in the multi-national context of the BRI can be far more challenging. Differences in legal and regulatory frameworks, disparities in economic development and business practices, and cross-cultural communication barriers could pose substantial obstacles (Zhang et al., 2016).

To overcome these challenges and unlock the potential of PPPs within the BRI, it needs careful planning, comprehensive risk assessment, and strong partnership between public and private entities, underpinned by mutual trust and a shared vision. Therefore, PPPs play a crucial role in the implementation of the BRI, providing the necessary financial resources, technical expertise, and efficiency gains. With the right strategies and management, PPPs could significantly contribute to achieving the BRI's objectives, fostering economic growth, and enhancing connectivity across countries and regions.

The global and complex nature of PPPs in the context of the BRI presents a wealth of research opportunities. This study aims to delve into the potential risks associated with overseas PPP investments within the BRI framework, which are inherently subject to a wide array of uncertainties spanning across cultural, political, economic, and legal aspects. While existing literature provides some insight into PPP risks, these are often limited in scope and typically focused on domestic scenarios. Hence, a comprehensive, in-depth analysis of risks in the international context, particularly within the multi-country, multi-sector BRI framework, presents a significant knowledge gap that this research intends to address.

1.2 Research Objective

1. Analyze and understand the current investment status of China's overseas PPP projects.

2. Identify and analyze potential risks and propose effective countermeasures that could be employed by both Chinese government and private stakeholders.

1.3 Research Scope

Given the comprehensive background and justification for this study, the scope of the research will be defined along the following parameters:

1. Geographical Scope: This research will focus on one or a few overseas PPP projects under the BRI. Therefore, the geographical scope will encompass countries involved in the BRI, spanning across Asia, Africa, and Europe.

2. Thematic Scope: The study will concentrate on the identification and analysis of potential risks associated with overseas PPP investments within the BRI. It will assess these risks from various dimensions, such as economic, political, legal, cultural, and technical aspects. In addition, the research will also explore possible countermeasures, focusing on strategies that can mitigate these identified risks.

3. Sectoral Scope: While the BRI encompasses a broad range of sectors, including transport, energy, telecommunications, and more, this research will not limit

itself to any specific sector. Instead, it will consider PPP projects across various sectors, aiming to extract general insights applicable to diverse contexts.

4. Stakeholder Scope: The research will consider the perspectives of multiple stakeholders involved in PPPs, including but not limited to governments (at both central and local levels), private entities (such as corporations, banks, and investors), and international organizations. This will ensure a comprehensive understanding of the risks and countermeasures from different viewpoints.

5. Temporal Scope: The research will primarily focus on PPP projects implemented since the inception of the BRI in 2013 till the present time. However, relevant historical contexts and precedents will also be considered where applicable.

In summary, this research aims to provide a comprehensive understanding of the potential risks in the BRI and corresponding mitigation strategies. This includes taking into account a wide variety of geographical contexts, sectors, and stakeholders, with a timeframe extending from the inception of the BRI to the present day.

1.4 Expected Results

This research aims to produce several key outcomes according to investigation of the risks and countermeasures associated with overseas PPPs under the BRI.

1. Comprehensive Risk Catalogue: A primary expected outcome is the development of a comprehensive catalogue enumerating potential risks associated with overseas PPPs within the context of the BRI. This catalogue will provide a structured classification of risks, organized into discrete categories such as economic, political, legal, cultural, and technical risks.

2. Risk Assessment Framework: The study aims to develop a risk assessment framework that can evaluate the severity and likelihood of identified risks. This framework will provide a structured, systematic approach for assessing risks, allowing stakeholders to prioritize them effectively.

3. Risk Mitigation Strategies: Concurrent with the identification and evaluation of risks, this research anticipates deriving a set of practical and effective risk mitigation strategies. The formulation of these strategies will be based on an

exhaustive analysis of successful PPP projects, a thorough review of existing literature, and potentially, expert interviews. These strategies will furnish actionable insights to stakeholders engaged in the BRI's overseas PPP projects.

4. Stakeholder-Specific Recommendations: Recognizing that different stakeholders have distinct roles, responsibilities, and concerns in PPP projects, the research will aim to provide tailored recommendations for each key stakeholder group. This nuanced approach will ensure that the findings are relevant and actionable for all parties involved.

Through these expected results, the research hopes to not only enhance the chances of success for PPP projects under the BRI but also contribute towards better risk management practices in global infrastructure development initiatives.

1.5 Research Contribution

This research is expected to provide contributions in both academic and practical contexts.

1.5.1 Academic Contribution

Expanding Literature on PPPs in International Context: While existing literature provides insights into Public-Private Partnerships (PPPs) and their risks, the majority of these studies are confined to domestic or single-country contexts. This research will contribute to expanding the academic discourse by providing a comprehensive analysis of PPPs in the multinational, multi-sector context of the BRI.

Developing a Risk Assessment Framework: The development of a comprehensive risk assessment framework specifically for overseas PPP projects within the BRI will constitute a notable academic contribution. This framework could serve as a valuable tool for further academic studies in the field.

Cross-disciplinary Insights: By considering economic, political, legal, and cultural dimensions of PPP risks, this research will contribute to an interdisciplinary understanding of global infrastructure development. It will provide insights that could inform studies in international business, development studies, political economy, and more.

1.5.2 Practical Contribution

1. Informing Policy and Decision-making: The findings of this research can provide critical insights for policymakers, businesses, and other stakeholders involved in BRI projects. By identifying potential risks and proposing effective countermeasures, the research can inform the development of policies and strategies that promote the successful implementation of PPP projects.

2. Enhancing Risk Management Practices: The research will contribute towards improving risk management practices in PPP projects. The developed risk assessment framework and mitigation strategies could serve as valuable tools for stakeholders involved in not only BRI projects but also other global infrastructure development initiatives.

3. Promoting Sustainable Development: By facilitating the successful execution of PPP projects, this research can indirectly contribute to the achievement of sustainable development goals. It can help ensure that infrastructure projects are not only economically viable but also socially beneficial and environmentally sustainable.

In conclusion, this research will provide valuable contributions that could deepen our understanding of PPP dynamics in the international context, inform better decision-making, enhance risk management practices, and ultimately, promote the sustainable development of global infrastructure.

CHAPTER 2
LITERATURE REVIEW

In this chapter, related literatures will be carefully reviewed. The objective is to explore the manifold aspects of Public-Private Partnerships (PPPs), which have gained considerable attention in recent years due to their increasing role in global infrastructure development, and notably within the framework of China's Belt and Road Initiative (BRI). A vast body of literature provides insights into the definition, evolution, and operational models of PPPs, as well as numerous successful implementations. Furthermore, a significant portion of the research is dedicated to analyzing the inherent risks in these partnerships and the strategies employed to mitigate them. This review also aims to delve into the perspectives of various stakeholders involved in PPPs. A comprehensive understanding of the aforementioned areas is critical for ensuing exploration of the specific risks associated with Chinese overseas PPP investments under the BRI, and the formulation of effective risk mitigation strategies.

2.1 Public-Private Partnerships (PPPs)

2.1.1 Overview of PPPs

Public-Private Partnerships (PPPs) are cooperative arrangements between two or more public and private sectors. Typically, they are long-term contracts where the private parties provide public services or infrastructure and assume substantial financial, technical, and operational risks in the project (The World Bank, 2022). These partnerships have emerged as a critical tool to address infrastructure development needs that could not be met by public sector entities alone. The essential characteristics of PPPs involve risk-sharing, mutual benefit, professional operation, long-term commitment, and shared governance between the public and private entities (Roehrich et al., 2014). Public-Private Partnerships are widely used in transportation, water conservancy, energy, environmental protection, social welfare, and other fields. In China, PPPs have become a key component within the national development strategy, as is evident in initiatives such as the BRI.

2.1.2 Evolution and Development of PPPs

The development history of PPPs can be traced back to the late 20th century when governments around the world started exploring additional financing avenues for public infrastructure and services. Public-Private Partnerships became increasingly popular during the 1980s and 1990s, most notably in the United Kingdom, under the Private Finance Initiative (PFI), a program designed to exploit private sector efficiencies in delivering public infrastructure projects (HM.Treasury, 2019).

The PPP model has significantly evolved since its early days. Initially, PPPs were primarily used for the construction of physical infrastructure (e.g., roads, bridges, hospitals). However, their use has expanded over time to include a wider array of public services, including healthcare, education, and even defense (Yescombe, 2011). Furthermore, while early PPP projects were largely concentrated in developed economies, the model has now been adopted extensively in developing countries, including China, acknowledging the model's potential to fill the infrastructure financing gap (The World Bank, 2022).

2.1.3 Various Forms of PPPs

Public-Private Partnerships can take several forms, depending on the level of participation and risk borne by the private sector. PPP models range from less extensive forms, such as management contracts and lease contracts, to more inclusive forms like concession contracts, Build-Operate-Transfer (BOT), Design-Build-Operate (DBO), and joint venture contracts (Figure 2 - 1) (ADB, 2021; The World Bank, 2023)

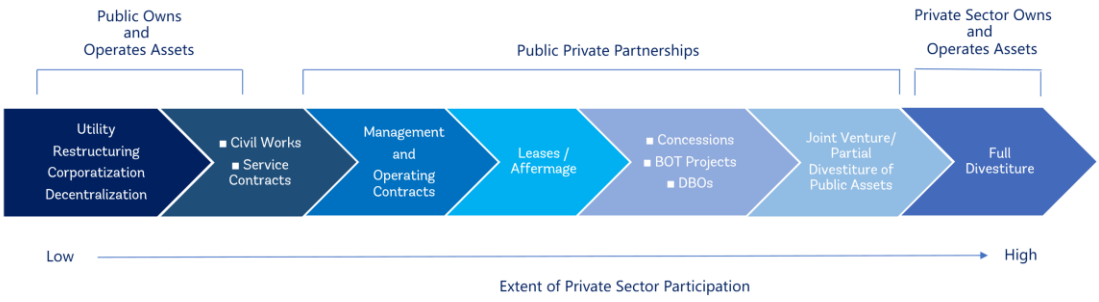


Figure 2-1 The spectrum of PPP agreements (The World Bank, 2023)

In management contracts and lease contracts, a higher portion of responsibility and risk remains with the public sector, while the private entity takes the lead in managing the service or facility. In contrast, in BOT, BOOT, and concession contracts, the private sector assumes a larger role, often being responsible for the design, construction, operation, and maintenance of the infrastructure project, and bearing considerable project-related risks, including those related to costs, revenues, and performance (ADB, 2021).

2.1.4 Overseas PPPs

In the current era of globalization and economic integration, the potential of overseas PPPs has become increasingly apparent. Oversea PPPs offer tremendous opportunities for both the public and private sectors, broadening the scope for development, profitability, and collaboration on a global level.

Overseas PPPs play a critical role in facilitating cross-border investment, enabling the optimal allocation of resources where they can be most effectively used on a global scale. They provide corporations with the ability to enter new markets, access unique resources, and leverage strategic advantages not available within their home countries. For governments, overseas PPPs provide an opportunity to establish stronger economic relations with foreign nations, attract overseas investment, and stimulate national economic growth and employment.

Moreover, overseas PPPs play an important role in promoting international cooperation and cultural exchange. By bringing together diverse stakeholders from different countries, these partnerships foster mutual understanding, enhance cross-cultural communication, and contribute to the enrichment of the global community. They establish connections between nations, help harmonize cultural and economic differences, and set the stage for mutual prosperity.

The positive impact of overseas PPPs also extends to the broader global economy. These partnerships stimulate economic activity, create jobs, and promote technological innovation across borders. By aligning the interests of public and private sectors towards common goals, they contribute to the balanced and sustainable growth of the world economy. In this light, overseas PPPs are not merely

transactional arrangements but transformative forces that hold the potential to shape a more interconnected and prosperous global society.

2.2 Successful Cases of PPPs

2.2.1 Successful Overseas PPP Projects

Various overseas PPP projects have manifested the potential of PPP models. For example, in South Africa, the Gautrain Rapid Rail Link, which connects Johannesburg, Pretoria, Ekurhuleni, and O.R. Tambo International Airport, stands as a testament to PPP's efficacy. This high-speed rail project, a joint venture between the South Africa government and the Bombela Concession Company, marked a substantial step forward in improving public transportation infrastructure while creating jobs and bolstering local economies. It stands as a testament to how a PPP can successfully manage complex, large-scale projects, navigating financial risks while delivering public benefits (Fombad, 2015).

In Europe, the Millau Viaduct in France stands as another example. This engineering marvel, the world's tallest cable-stayed bridge, was executed under a PPP agreement. The French government retained the ownership of the structure, while a private consortium, Compagnie Eiffage du Viaduc Millau, carried out the construction and maintenance of the bridge. The Millau Viaduct was completed on time and within budget, serving as a case study in how PPPs can effectively manage costs and deliver infrastructural projects (O'Toole, 2022).

2.2.2 PPP in the Context of the Belt and Road Initiative (BRI)

2.2.2.1 Examination of Literature on China's Use of PPPs in the BRI

China's strategic use of PPPs has been examined in literature. Report of Clifford Chance (2019) highlighted that PPPs serve as a fundamental tool in executing the BRI. These arrangements not only facilitate resource amalgamation and risk distribution among public and private entities but also increase the viability of long-term, transnational infrastructure projects by incorporating private sector efficiencies.

2.2.2.2 Specific Case Studies of PPP Projects within the BRI

Specific case studies provide a clear picture of how PPPs are used within the BRI context. The Colombo Port City project in Sri Lanka is an example. As a PPP agreement between the Sri Lankan government and China's CHEC Port City Colombo (Pvt) Ltd., this project plans to transform 269 hectares of reclaimed land into a world-class city that would act as a hub for commerce, residences, and tourism. This project is not only going to increase Sri Lanka's global competitiveness but also create a significant number of job opportunities. The collaboration under the PPP framework ensures the project benefits from Chinese expertise in infrastructure construction, promoting efficient implementation and rigorous quality control (Kim et al., 2019).

2.2.2.3 Analysis of the Benefits and Challenges of Using PPPs in the BRI Context

Despite the numerous benefits of the application of PPPs within the BRI, it is necessary to acknowledge and manage the challenges. On the one hand, PPPs can offer substantial advantages, including access to private funding, technical expertise, and efficient management practices. They allow for risk sharing and can drive innovation in project delivery. On the other hand, the use of PPPs in an international, cross-border context means more complexities.

Yu et al. (2018) identified political, legal, economic, and cultural risks as significant factors to consider in BRI's PPP projects. Political risks could come from changes in government policy or unstable political situations in the host country. Legal risks could arise from differences in legal systems, regulatory frameworks, or contract enforcement between countries. Economic risks could be caused by exchanging rate fluctuations, inflation, or market instability. Cultural risks encompass issues related to different business cultures, languages, and social norms.

Despite these challenges, the literature suggests that with careful management, the benefits of PPPs can significantly exceed the challenges. This is especially true when considering the scale and ambition of projects within the BRI, where private sector involvement can play a critical role in mitigating financial risk, enhancing project efficiency, and promoting knowledge and technology transfer. This

balance between the benefits and challenges of using PPPs is a critical component of project success within the BRI framework.

2.3 Risks in PPPs

2.3.1 Overview of Common Risks in PPPs

Public-Private Partnerships inherently come with a number of risks. Understanding these risks is crucial for both public and private parties to ensure the successful implementation of projects.

Economic risks can come from market fluctuations, which might impact the financial feasibility of the project. Changes in inflation, sudden shifts in the cost of raw materials, or even shifts in market demand can all affect the economic viability of a PPP project (Xu et al., 2010). Due to their long-term features, PPPs are particularly susceptible to such risks, which may also include those related to interest rates, liquidity, and credit.

Political risks are particularly pertinent in the case of PPPs, given the involvement of the public sector. Changes in government policies, political instability, or public opposition can significantly disrupt the project timeline or its overall feasibility (Bing et al., 2005). Regulatory changes can lead to increased costs or delays, while political instability might lead to the complete discontinuation of a project. On the other hand, public opposition can come from a perceived lack of transparency or negative environmental or social impacts.

Legal risks typically arise from regulatory changes, legal disputes, or difficulties in enforcing contracts (Cheung et al., 2009). Due to the long duration of many PPP contracts, legal risks are significant and can range from changes in laws affecting the project's legality to difficulties in interpreting or enforcing the terms of contracts. Furthermore, potential disputes between the public and private partners can lead to legal battles, further complicating project implementation.

Technical risks are inherent in any construction or infrastructure project, but they take on a unique dimension in PPP projects. Such as design errors, construction difficulties, or unanticipated technical challenges that might arise during project execution (Xu et al., 2010). Technical risks can lead to cost overruns, delays, and

subpar quality in project outcomes. Furthermore, technical risks can also include technological obsolescence, especially given the long-term nature of many PPP contracts.

Cultural risks, often underestimated, are significant in the context of PPPs, particularly in the international arena. Different business cultures, languages, social norms, and expectations can cause misunderstandings and conflicts that impede project progress (Zhang, 2005). These can lead to miscommunication, misalignment of goals, and even the dissolution of partnerships.

2.3.2 Specific Risk Factors in Overseas PPPs

When it comes to overseas PPP projects, these risks are amplified. Operating in an international context inherently brings additional complexities, such as dealing with different legal, political, and economic systems, managing cultural differences, and handling foreign exchange risk.

In the context of the Belt and Road Initiative (BRI), these risks are even more pertinent. Risks include political instability in the host country, exchange rate and inflation fluctuations, cultural differences, and legal and regulatory inconsistencies (Yu et al., 2018).

Political instability in the host country can lead to policy changes, public opposition, or even conflicts, which might significantly derail a project. Fluctuations in exchange rates and inflation can exert influence on project costs and revenues, thus impacting the feasibility of the project. Cultural difference may result in communication barriers and misconceptions, hampering seamless project execution. Discrepancies in legal and regulatory frameworks can engender challenges in contract enforcement and compliance with local regulations, leading to delays, escalated costs, or potential project termination.

2.3.3 Risk Assessment Models

The management of risks is a crucial task in PPP projects. Over the years, various risk assessment models and frameworks have been proposed to help in this regard.

A comprehensive risk management process has been proposed by Akintoye et al. (2003), including identifying, assessing, allocating, and managing project risks. This process starts with identifying all potential risks, assessing their likelihood and impact, and then allocating each risk to the party best equipped to manage it. Subsequently, appropriate risk management strategies could develop to mitigate these risks.

For international PPP projects, Xu et al. (2010) designed a comprehensive evaluation model. This model has considered both qualitative and quantitative factors in risk assessment, making it more versatile for a wide range of projects. It allows for a more nuanced understanding of risks in international projects, given the increased complexity and uncertainties in such projects.

Cheung et al. (2009) developed a framework that focuses on the risk allocation process in PPP projects. Recognizing that appropriate risk allocation is a key determinant of project success, their framework emphasizes the need for a balanced risk allocation strategy. Such a strategy would ensure that risks are borne and managed by the party best equipped to handle them, thereby improving overall project outcomes.

All these frameworks must be adapted to the specific project context and objectives. And, due to the complex of risks in PPPs, it is crucial to adopt a flexible and dynamic approach to risk management, allowing for adjustments as the project progresses.

2.4 Mitigation Measures for PPP Risks

Risk mitigation refers to the process of identifying, evaluating, monitoring, and responding to various risks during the operation of PPP projects. Different risks require different risk response strategies, including avoidance, transfer, sharing, reserve, etc. Common risk mitigation tools include risk assessment, Risk Control Matrix (RCM), Risk Matrix, emergency plans, insurance, guarantee mechanisms, etc. In PPP projects, the planning, initiation, implementation, and monitoring of risk management and countermeasures need to be closely related to the entire lifecycle of

the project. Establishing a robust risk management system is the key to ensuring the successful operation of the project and achieving project goals.

2.4.1 General Strategies for Risk Mitigation in PPPs

The successful delivery of PPP projects depends on effective risk mitigation strategies. Literature has widely acknowledged the importance of risk identification, management, and operational responses as key to successful project implementation (Zhang, 2005).

Identification of risks involves understanding each risk (Akintoye et al., 2003). This phase requires a thorough exploration of potential risks in the project environment, including those emanating from economic, political, legal, technical, and cultural spheres.

Management of risks includes risk assessment, risk allocation, and risk response planning. Risk assessment includes quantifying the likelihood and potential impact of each risk. Then, risk allocation assigns each risk to the partner best equipped to handle it. This approach aligns with the core PPP principle that the private sector should assume risks that it can manage more effectively than the public sector.

Operational responses refer to measures taken to mitigate and manage risks during the project execution phase. These include both proactive strategies, such as contingency planning and the use of insurance, and reactive strategies, such as dispute resolution mechanisms.

Moreover, Porter's Five Forces model also provides a valuable framework to analyze the competitive environment of a PPP project and anticipate potential risks. It allows the parties to better understand their position in relation to suppliers, customers, potential entrants, substitute products, and industry competitors, thereby contributing to a comprehensive risk analysis (Porter, 2008).

2.4.2 Literature on Specific Risk Mitigation Strategies for Overseas PPPs

Overseas PPPs often present unique challenges due to differences in culture, regulations, and business environments between home and host countries. These

require the application of more specialized and localized risk mitigation strategies (Yu et al., 2018).

Firstly, comprehensive market research is integral for understanding the host country's environment, political stability, regulatory framework, and culture. This not only helps in identifying potential risks but also aids in designing appropriate mitigation measures (Bing et al., 2005).

Secondly, robust contract design is vital. It should not only be legally sound but also be flexible to accommodate unforeseen contingencies, especially those unique to the host country (Cheung & Chan, 2011). Some recommended elements include clear definition of each party's rights and responsibilities, dispute resolution mechanisms, force majeure clauses, and provisions for risk sharing.

Thirdly, the utilization of local expertise is paramount in overseas PPPs. Local partners can provide critical insights into the local business environment, social and cultural nuances, and help in navigating the bureaucratic processes, therefore mitigating cultural and administrative risks (Merna & Njiru, 2002).

Moreover, securing political risk insurance, particularly for PPPs in countries with volatile political climates, can be an effective way to safeguard against expropriation, political violence, and breach of contract by the host government (J. Bennett & Iossa, 2006).

2.4.3 Case Studies of Successful Risk Mitigation in the BRI

Understanding successful risk mitigation examples within the BRI or similar contexts can provide valuable insights for future PPP projects.

The Colombo International Container Terminals in Sri Lanka is a successful example of a PPP project within the BRI (Huang, 2016; Wijesinha, 2021). This project faced considerable risks, including economic uncertainty and public opposition. However, by conducting proper risk management, such as transparent communications and active stakeholder engagement, these risks were effectively mitigated, and the project was implemented successfully.

Another exemplary case of this is the Jakarta-Bandung High-Speed Rail project in Indonesia, also as a BRI project. This project faced significant risks,

including land acquisition issues and regulatory hurdles. Through the contractual arrangement, comprehensive feasibility studies, and the integration of local expertise, these risks were successfully mitigated, and the project is ongoing as planned (Maryani & Abidin, 2022; Purba & Purba, 2020).

In another case, the Hungary-Serbia Railway project faced considerable economic and political risks. These were successfully mitigated through a combination of careful due diligence, robust risk allocation in the project contracts, and the active engagement of stakeholders at all levels. The project was completed successfully and provided an nice example of the application of risk mitigation strategies in the context of overseas PPP projects (Lai et al., 2021).

These case studies highlight the importance of comprehensive risk management in ensuring the successful implementation of PPP projects. They examined the fact that while risks are inherent in any PPP project, especially those under initiatives like the BRI, they could be effectively mitigated through careful planning, proactive management, and strategic partnerships.

2.5 Stakeholder Perspectives in PPPs

2.5.1 Roles, Interests, and Strategies of Various Stakeholders in PPPs

Stakeholders within PPPs usually comprise a diverse assemblage of entities, including government agencies, private sector organizations, financiers, end-users, and the broader community. Each stakeholder's role, interest, and strategy play a crucial part in the successful execution of a PPP project.

Government agencies represent the public interest. They typically instigate, regulate, and supervise the project. They are invested in ensuring the projects deliver high-quality public services, provide value for money, and are sustainable.

Private sector organizations, often a consortium of construction, financial, and operational firms, provide the capital, technical expertise, and managerial efficiency. Their primary interests lie in the profitability of the project, the predictability of cash flows, and the efficacious management of risks (Roehrich et al., 2014).

Financiers, such as banks or institutional investors, provide the funding for the project. They are interested in the creditworthiness of the project, the security of their investment, and the adequacy of returns (Akintoye et al., 2003).

End-users, including consumers and businesses who use the public service, care about the quality, cost, and reliability of the service, while the wider community may have interests related to job creation, environmental impact, and social equity.

2.5.2 Analysis of Stakeholder-specific Risk Perceptions and Mitigation Strategies

Different stakeholders perceive and prioritize risks differently due to their unique interests and roles. For example, government agencies might be concerned about political risks, such as changes in public opinion or government policy. However, private sector participants are more likely to focus on commercial risks, such as cost overruns, demand shortfalls, or operational problems. Financiers worry about financial risks, including exchange rate or interest rate fluctuations. End-users and the community may be sensitive to service risks, such as disruptions or reductions in service quality.

Stakeholder-specific mitigation strategies often revolve around effective communication, engagement, and risk-sharing arrangements. For instance, government agencies can engage in public consultations to understand and address public concerns. Private sector participants can adopt sophisticated project management tools to control costs and enhance operational efficiency (Roehrich et al., 2014). Financiers can require stringent financial covenants and insurance requirements to protect their interests (Akintoye et al., 2003).

2.6 Conclusion

Upon reviewing the related literature, an extensive understanding of the nature, operation, and implications of PPPs has been acquired. The wide array of successful PPP implementations, as well as the elaborate risk mitigation measures highlighted in various case studies, contribute to the rich tapestry of knowledge in this field. The review also sheds light on the intricate roles and perspectives of the diverse stakeholders involved in PPPs. Particularly noteworthy is the complex interplay of

economic, political, and cultural factors within the BRI context, which poses unique challenges and opportunities for overseas investments through PPPs.

While the reviewed literature provides a foundation, it also reveals a gap in knowledge concerning the specific risks and mitigation measures associated with Chinese investments in overseas PPP projects under the BRI. Thus, the necessity for further research to address this gap becomes evident. The findings of such research will not only enrich the academic discourse around PPPs but also offer valuable guidance for policymakers, practitioners, and future research endeavors in this arena.

CHAPTER 3

RESEARCH METHODOLOGY

This chapter outlines the research methods employed in the study, providing essential tools for a rigorous examination of the risks and mitigation measures associated with China's investment in overseas Public-Private Partnerships (PPPs) projects under the Belt and Road Initiative (BRI).

3.1 Literature Review Method

The literature review entailed a comprehensive exploration of existing academic works pertinent to the research subject. This process facilitated the positioning of the study within the broader scholarly discourse, identification of gaps in the current knowledge, and informed the research design.

3.1.1 Criteria for Selection of Literature

Given that the BRI was initiated in 2013, the literature selected spans the last ten years. Inclusion criteria encompassed relevance to overseas PPPs and BRI, recent publication date (within the last decade), and a high citation count, signifying the work's recognition and impact in the field.

3.1.2 Analysis Approach

A thematic analysis was conducted by summarizing and refining the content from various academic articles and industry reports. The literature was categorized into review-type literature and case-type literature. Review-type literature was used to extract the developmental trajectory of BRI-PPP, summarizing the risks faced by different PPP projects and the corresponding solutions proposed by various scholars. By comparing different literature, the most widely recognized impactful risks and optimal solutions were identified. Additionally, since different scholars have different classification standards, and these standards are not uniform across the industry, the risks were classified into broad categories to make the final analysis more intuitive.

3.2 Case Study

3.2.1 Selection of Case Studies

To enhance the understanding of risks and mitigation strategies in overseas PPP projects, a preliminary screening was conducted based on their relevance to the BRI, success or failure, availability of information, and representativeness of various types of PPP projects and risk scenarios. Through in-depth investigations, five cases were specifically selected for in-depth analysis based on their international influence and the typicality of their success or failure, aiming to profoundly understand the complex phenomena in the actual context.

3.2.2 Data Collection

Data was compiled from multiple sources, including project documents, annual reports, news articles, and interviews where feasible, to bolster the reliability and validity of the findings.

3.2.3 Analysis of Case Studies

The case studies were scrutinized using theoretical frameworks, involving the identification of key stakeholders, their interests and influences, risks faced in the project, and mitigation strategies employed. This analysis aimed to unravel the underlying dynamics and intricacies of each case, extracting lessons applicable to other projects.

3.2.4 Comparative Analysis

Subsequent to analyzing the individual cases, a comparative analysis was performed to discern commonalities and differences amongst the cases. This exercise further illuminated the factors instrumental to the success or failure of overseas PPP projects and the efficacy of varied mitigation strategies.

3.3Theoretical Analysis

3.3.1 Explanation of the Selected Theories

The study was predicated on two primary theoretical frameworks: Stakeholder Theory and Risk Management Theory. Stakeholder Theory posits that organizations are complex systems where diverse groups or individuals (stakeholders) exert varying

degrees of influence based on their interest, power, and the urgency of their claims (Freeman et al., 2010). This framework is invaluable for dissecting the intricate relationships amongst various actors in a PPP project, such as the government, private firms, financiers, and the public. Conversely, Risk Management Theory provides a robust set of tools for identifying, assessing, and responding to risks in a project (Hopkin, 2013), thereby proving instrumental in deciphering the different types of risks inherent in overseas PPP projects and formulating the most effective strategies for their mitigation.

3.3.2 Application of Theories to PPP and BRI Context

The theoretical frameworks were employed to analyze selected overseas PPP projects, utilizing Stakeholder Theory to probe how the divergent interests and levels of influence of various stakeholders impinge upon project outcomes. This analysis also shed light on the negotiation processes preceding the establishment of a PPP contract and the potential conflicts that may arise during project implementation. Risk Management Theory was applied to categorize the potential risks endemic to these projects, encompassing a meticulous analysis of each project phase, from the initial project appraisal to the operational stage, with the aim of pinpointing the potential risks at each juncture and formulating the optimal strategies for their management.

3.3.3 Interpretation of Results

The insights gleaned from the theoretical analysis were synthesized to develop a comprehensive understanding of the risks and mitigation strategies in overseas PPP projects under the BRI. The application of Stakeholder Theory illuminated the paramount importance of effective stakeholder management in ensuring project success. In contrast, Risk Management Theory equipped us with the necessary tools for crafting effective risk management strategies in these projects. Through this analysis, the study is poised to proffer practical recommendations for stakeholders involved in overseas PPP projects under the BRI.

In summary, this chapter has recapitulated the research methodologies pivotal to the investigation of the risks and mitigation strategies associated with Chinese overseas PPP investments, ensuring a holistic exploration of the research question through an integrated literature review, theoretical analysis, and case studies.

CHAPTER 4

RESULT AND ANALYSIS

Navigating through the multifaceted domain of overseas Public-Private Partnerships (PPPs), particularly within the context of China's expansive Belt and Road Initiative (BRI), this chapter delves into a thorough analysis of the intricacies involved in Chinese investments and the formulated mitigation strategies. The BRI, embracing over 150 countries and 30 international organizations, has unveiled an era where the intertwining of promising economic prospects and emerging challenges form a complex narrative requiring meticulous examination and robust strategic development (IOSC, 2023).

China's overseas PPPs elucidate not just the nation's financial prowess but also its strategic economic outreach. However, underlying these ventures is a plethora of risks and challenges—some discernible and others enigmatic, embedded within the fabrics of political, cultural, and socioeconomic contexts of host nations. The necessity for a detailed exploration and analysis of these entwined challenges hence comes to the fore.

Emanating from the myriad of issues, including inefficiencies, corruption, and various other factors that potentially endanger up to 30% of potential gains from investments in emergent public projects, a thorough scrutiny is mandated to understand the landscape of overseas investments and navigate through the latent risks therein (Matt & Anarkalee, 2019). The ensuing narratives unfold amidst host nations, some grappling with their own internal conflicts, making the terrain of investments even more convoluted and the necessity to avoid misjudgments and errors paramount.

4.1 Summary of Literature Review

In order to reveal the complex network of risks and mitigation strategies associated with the BRI within the framework of PPPs, an exhaustive literature survey was conducted. Utilizing "BRI", "PPP", and "Risk" as keywords, hundreds of English and Chinese literature resources were unearthed on Google Scholar and China

National Knowledge Infrastructure (CNKI). The majority of these resources are filled with studies on individual cases, which will be elaborated upon in the subsequent case study section. To extract the essence from the literature and gain an overview of the developmental trajectory of BRI adopting PPP for investments, this section will focus on an in-depth analysis of review-type literature. Consequently, fourteen valuable review articles and three relevant research reports were specially selected as the subjects of study, providing a solid foundation for identifying contemporary risks and management strategies related to PPP projects under the BRI context. Given that different literature has varying degrees of detail and definitions for classifying risks, I have summarized the classification methods from these literatures and divided the risks into major categories such as: political risks, economic risks, social risks, geographical risks, operational risks, technological risks, and legal risks.

Delving into these categorized risks, political risk envelops issues such as corruption, government stability, law and order, and international relations. Economic risks highlight elements like local GDP, funding sources, yields, and investment openness. Social risks bring to the fore disparities in culture and ethnicity, social security, and public opinion. Geographical risks underscore geographical resources, climate, and natural disaster propensities. Operational risks unveil aspects related to competition and market dynamics, while technical risks include incompatibilities arising from different technological protocols, technology innovation, reliability, and obsolescence (Table 4 - 1).

Table 4-1 Risk classification and corresponding literature.

Risks	Related Literatures
Political Risk	(Zhao et al., 2018)(BFTD, 2019)(Sibo & Choudhary, 2018)(Zhou, 2018)(Li et al., 2021)(Xiang et al., 2022)(Kong, 2023)(Li et al., 2020)(Sun, 2017)(Luo et al., 2022)(Lv, 2022)(Wang et al., 2021)(Liao et al., 2019)(Liang, 2020)
Economic Risk	(Zhao et al., 2018)(BFTD, 2019)(Zhou, 2018)(Li et al., 2021)(Xiang et al., 2022)(Kong, 2023)(Li et al., 2020)(Sun, 2017)(Luo et al., 2022)(Lv, 2022)(Wang et al., 2021)(Liao et al., 2019)(Liang, 2020)
Social Risk	(Zhao et al., 2018)(Sibo & Choudhary, 2018)(Zhou, 2018)(Li et al., 2021)(Xiang et al., 2022)(Kong, 2023)(Li et al., 2020)(Sun, 2017)(Luo et al., 2022)(Lv, 2022)(Wang et al., 2021)(Liao et al., 2019)(Liang, 2020)
Geographical Risk	(Zhou, 2018)(Xiang et al., 2022)(Kong, 2023)(Liao et al., 2019)(Liang et al., 2023)
Operational Risk	(Zhao et al., 2018)(Li et al., 2021)(Li et al., 2020)(Sun, 2017)(Lv, 2022)(Wang et al., 2021)(Liang, 2020)
Technical Risk	(Zhao et al., 2018)(Sun, 2017)
Legal Risk	(BFTD, 2019)(Sibo & Choudhary, 2018)(Kong, 2023)(Li et al., 2020)(Sun, 2017)(Luo et al., 2022)(Lei, 2017)(Lv, 2022)(Wang et al., 2021)(Liao et al., 2019)(Liang, 2020)

Additionally, different literature provides a variety of related strategies. Although the terminology and contexts may differ, they mainly revolve around themes such as policy support, multi-faceted safeguards, streamlining processes, profit allocation, training professionals, regulatory augmentation, strategic preparedness, robust investment, and emergency response.

Specifically, policy support alludes to auxiliary policies, framed at national, corporate, or project-specific levels. The multi-faceted safeguarding revolves around comprehensive pre-project research and evaluation, ensuring a protective net for the interests of enterprises involved post-project commencement. Streamlining project processes entails the elimination of superfluous procedures to expedite project timelines and economize on expenditures. Profit allocation suggests a deliberate distribution of profits to stimulate collaborative endeavors. Training professional is geared towards bridging the prevalent expertise and personnel gaps in China's overseas investments. Regulatory augmentation seeks to avert issues stemming from a paucity of oversight, while strategic preparedness establishes a holistic risk assessment system to preemptively ward off risks. Robust investment pertains to rallying additional funds into projects and emergency response mechanisms involve crafting a spectrum of strategies to various unpredicted scenarios to safeguard stakeholder interests (Table 4 - 2).

Table 4-2 Mitigation Strategies and corresponding literature.

Mitigation Strategies	Related Literatures
Policy Support	(Zhao et al., 2018)(Kong, 2023)(Sun, 2017)(Lei, 2017)(Lv, 2022)(Wang et al., 2021)(Ma & Xu, 2022)(Liao et al., 2019)(Liang, 2020)
Multi-faceted Safeguards	(Zhao et al., 2018)(BFTD, 2019)(Zhou, 2018)(Li et al., 2020)(Sun, 2017)(Wang et al., 2021)(Ma & Xu, 2022)(Liao et al., 2019)(Liang, 2020)
Streamlining Processes	(Zhao et al., 2018)(BFTD, 2019)(Kong, 2023)(Sun, 2017)(Lv, 2022)

Table 4-2 Mitigation Strategies and corresponding literature. (continued)

Mitigation Strategies	Related Literatures
Profit Allocation	(Zhao et al., 2018)(BFTD, 2019)(Kong, 2023) (Lv, 2022)(Wang et al., 2021)
Training Professionals	(Zhao et al., 2018)(Li et al., 2020)(Luo et al., 2022) (Ma & Xu, 2022)
Regulatory Augmentation	(Zhao et al., 2018)(Luo et al., 2022)(Lei, 2017) (Wang et al., 2021)(Ma & Xu, 2022)(Liao et al., 2019)
Strategic Preparedness	(BFTD, 2019)(Zhou, 2018)(Liang et al., 2023)(B. Li et al., 2020)(Luo et al., 2022)(Lei, 2017)(Lv, 2022)(Wang et al., 2021)(Ma & Xu, 2022)(Liao et al., 2019)
Robust Investment	(Sibo & Choudhary, 2018)(Kong, 2023)
Emergency Response	(Zhou, 2018)(Liang et al., 2023)

Through the analysis of selected literatures, several crucial insights were deduced:

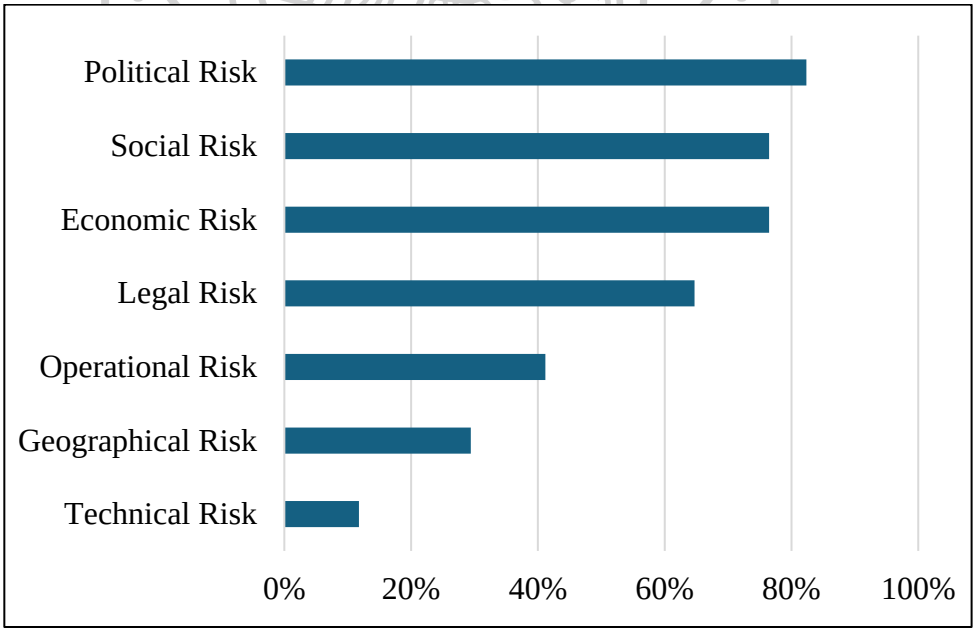


Figure 4-1 Probability of different risks being addressed.

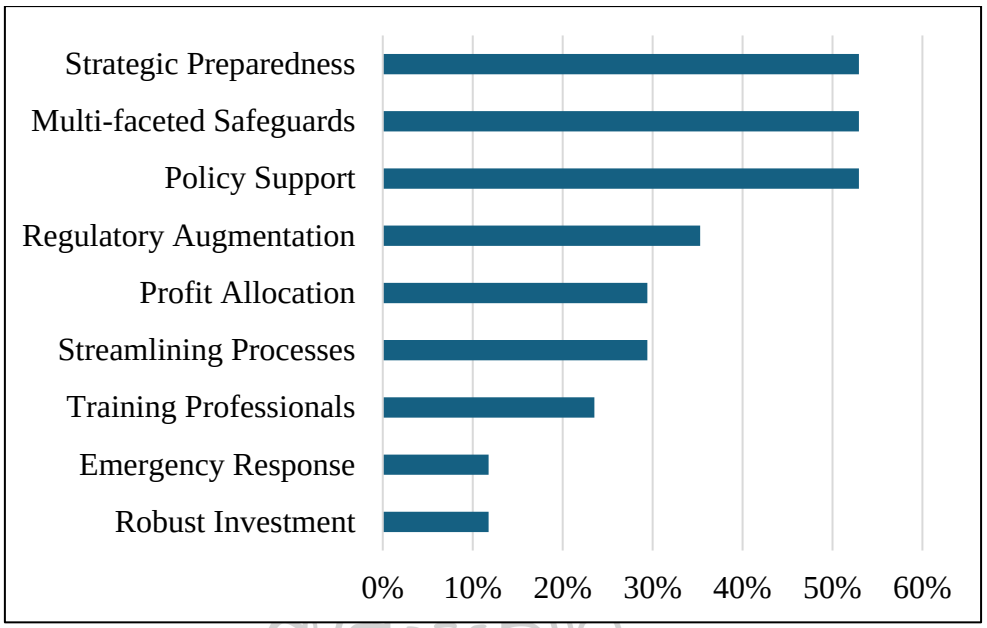


Figure 4-2 Probability of different mitigation strategies being addressed

1. Predominant Risks and Solutions: Through an integration of the frequency of various risks mentioned in the literature, it was found that the most important and most frequently mentioned risk is political risk, with a mention rate as high as 82.4% (Figure 4 - 1). This indicates that the stability, integrity of the local government, and the support for China's proposed initiative are all crucial to the successful implementation of a PPP project. Only by properly handling political risk can a PPP project be considered to have laid a solid foundation. Following closely are social risk and economic risk, tied for the second biggest influencing factors. This points out that although many projects receive local government support, they may still encounter disruptions from local public opposition, cultural conflicts, insufficient funds, and low investment openness. A typical project hindered by public opposition is the Myitsone Dam project, which will be discussed in the case study section.

As for the mitigation strategies, there isn't as much consensus among scholars as there is for the risks. Generally, different mitigation strategies are divided into three tiers. The most mentioned are strategic preparedness, multi-faceted safeguards, and policy support, each with a mention rate of around 50% (Figure 4 - 2). The second tier includes Regulatory Augmentation, Profit Allocation, Streamlining Processes, and

Training Professionals, with mention rates between 20% to 35% (Figure 4 - 2). The last tier consists of Emergency Response and Robust Investment, with a mention probability of only about 10%. Compared to risks, the consensus that most scholars can reach in the risk classification is not reflected in the risk mitigation strategies. For example, the mention rates of Political Risk, Social Risk, and Economic Risk are all above 70%, while the highest in risk mitigation strategies doesn't exceed 55% (Figure 4 - 1 and Figure 4 - 2).

2. Potentially Underscored Risks and Solutions: Although political, economic, and social risks as well as legal support have received more attention, the infrequent mention of technological risk may indicate that contemporary research may be insufficient or neglectful in this area. Although technological risks are mentioned less frequently, they may have significant impacts in practice, such as technical obstacles in project execution or the reliability of deploying technology. This highlights the potential inconsistency in research focus. As for solutions, enhanced investment and emergency plans, although not dominant in discussions, need further exploration and discussion in academia. Although their theoretical utility may not be as useful as policy support or multi-faceted safeguards, the nearly five-fold difference in mention rates shows that there is potential for further research in these two directions.

3. Diversity in Existing Research: Overall, the data highlights the diverse discussions of risks and solutions in the literature, presenting a variety of theories. Within these theories, there are both commonalities and differences, indicating that existing academic debates are healthy and diverse.

4.2 In-Depth Case Studies Analysis

Public-Private Partnership investments, typically characterized by extensive investment cycles, hefty financial inputs, and sluggish returns, predominantly feature projects related to terrestrial and maritime transport, as well as energy. To corroborate and delve deeper into the risks and risk control measures synthesized in literature review, scrutinizing both successful and failed practical cases is imperative. This enables us to furnish more reliable investment advice for future endeavors. Consequently, five classic cases have been picked for representation, with the initial

three exemplifying relative successes and the latter two illustrating impediments (Table 4 - 3).

Table 4-3 Five representative cases analysis

Project	Country	Major Risk	Major Mitigation Strategy	Outcome
Karot Hydropower Project	Pakistan	Debt	Debt restructuring	Successfully constructed and initiated operational phase
Yamal LNG Project	Russia	International sanctions, Environmental issues	Policy support, Robust investment, Technical support	Successfully constructed and initiated operational phase
Hambantota Port Project	Sri Lanka	Debt, Political pressures from societal discontent	Debt Restructuring, Policy support	Successfully constructed and initiated operational phase
Jakarta-Bandung High-Speed Railway Project	Indonesia	Land acquisition, Financing issues	Social communication, Robust Investment	Completion was postponed by 4 years, currently commenced operations, profitability remains unknown
Myitsone Dam Project	Myanmar	Opposition from local inhabitants	Policy Support	Suspended

4.2.1 Case Study: Karot Hydropower Project

Located in Pakistan's Punjab Province, the Karot Hydropower Project, a 720MW hydroelectric power station situated on the Jhelum River, is part of the China-Pakistan Economic Corridor (CPEC). Involving cooperation and investment from both countries, it aims to augment Pakistan's power supply and improve infrastructure (Butt, 2021; Khan et al., 2020). The project commenced construction in 2015 and was officially operational for commercial purposes in 2022 (GlobalData, 2023) with a total construction cost of $1.42 billion.

1. Stakeholder Analysis:

Chinese Government and Corporations: Invest and provide technological support to the project, aiming to reinforce Sino-Pakistani relations and expand international influence.

Pakistani Government and Corporations: Eager to resolve power shortages and support project execution. The project is developed and owned by Karot Power, holding 100% of shares.

Local Residents: Concerned about the project’s impact on the environment and community life, yet direct beneficiaries of the project.

Environmental Organizations: Attuned to the impact of hydroelectric station construction and operation on ecology and environment.

2. Risk Analysis:

Economic Risk: The substantial debt undertaken by Pakistan raises concerns about debt sustainability (Khan et al., 2020).

Technical Risk: Challenges and issues in project construction and operation.

Political Risk: Impact of bilateral and local political stability on the project.

Environmental Risk: Project impact on the surrounding environment and ecology (Butt, 2021).

Mitigation Strategies and Outcomes

Debt Restructuring: Pakistan engaged in debt restructuring and renegotiation with China to alleviate debt pressures (Khan et al., 2020).

Technical Exchange and Cooperation: Introduce international advanced technology and management experience.

Political Communication: Strengthening Sino-Pakistani political and economic communication and cooperation.

Environmental Measures: Implement stringent environmental measures and regulations.

Community Involvement: Engage community residents actively in project decisions and management.

4.2.2 Case Study: Yamal LNG Project

The Yamal LNG Project, located in the northern Russian Yamal Peninsula, is a significant liquefied natural gas production project. It includes the development of the South Tambey field on the Yamal Peninsula and the construction of an LNG plant. The project stakeholders comprise Russian Novatek, Chinese CNPC, and the Belt and Road Foundation, solidifying Sino-Russian energy collaboration (Bennett, 2016; Defraigne, 2021; Katysheva, 2019).

1. Stakeholder Analysis

Chinese Government and Corporations: Vital stakeholders invested in the project's success and sustainability.

Russian Government and Corporations: Desiring economic development and energy exportation, with Novatek as the primary investor and operator.

Local Communities: Concerned about the project's impact on the local environment and economy.

2. Risk Analysis

Market Risk: Fluctuations in the global natural gas market affect the project’s economic viability.

Political Risk: Sino-Russian relations and international political situations that may impact the project. Sanctions against Russia has also created difficulties in financing the project and international cooperation.

Environmental Risk: Significant environmental issues potentially arising from large-scale engineering in the Arctic region.

Technical Risk: Construction and operation in Arctic conditions present major technical challenges.

3. Mitigation Strategies and Outcomes

Market Analysis: Conducting in-depth market research and adopting corresponding strategies, including diversified market strategies.

Political Communication: Stabilizing and strengthening Sino-Russian cooperation through diplomatic channels.

Environmental Technology: Strict adherence to international and domestic environmental standards and additional investments in ecological protection.

Technical Improvements: Collaboration with enterprises experienced in Arctic construction and operation to develop relevant technologies.

4.2.3 Case Study: Hambantota Port Project

The Hambantota Port, situated in southern Sri Lanka, initially existed as a port of modest scale. Due to the country's strategic location, it has garnered a pivotal role in China's Belt and Road Initiative (BRI), aiming to bolster economic ties between the two nations and enhance regional connectivity. The project, embedded with extensive infrastructure development and investment, aspires to evolve into a principal maritime hub (Carrai, 2018; Wibisono, 2019).

1. Stakeholder Analysis:

Chinese Government and Corporations: Aiming to further the BRI through foreign infrastructure investments.

Sri Lankan Government: Desiring economic promotion via the investment and infrastructure development, acting as the recipient nation.

Local Communities: Potentially directly impacted by the project's construction and future operations.

International Community and Organizations: Observing possible regional impacts and its role in the global shipping network.

2. Risk Analysis:

Financial Risk: The colossal investment initially required for the project burdened Sri Lanka with substantial debt.

Political Risk: Political pressures and societal discontent arising from the related debt issues.

Operational Risk: The port's operations falling short of expectations, unable to generate sufficient revenue to service debt.

Environmental Risk: Potential impacts of port construction and operation on the local environment.

3. Mitigation Strategies and Outcomes:

Debt Restructuring: Sri Lanka alleviated debt pressures by transferring port control to Chinese enterprises (Carrai, 2018; Wibisono, 2019).

Operational Optimization: Enhancing port efficiency through partnerships and incorporating international expertise.

Multilateral Cooperation: Engaging investment and cooperation from other countries and international organizations to balance China's role in the project.

Policy and Regulations: Developing and enforcing relevant policies to ensure smooth project progression.

Environmental Protection: Implementing measures to mitigate the project's environmental impact.

4.2.4 Case Study: Myitsone Dam Project

The Myitsone Dam Project, located in Myanmar, epitomizes a pivotal hydroelectric initiative by Chinese enterprises within Myanmar. Envisaged as a catalyst for bolstering local economic development through significant electric power provision, the project encountered an unforeseen hiatus. In 2011, amidst a turbulent

confluence of social, environmental, and political dilemmas, the Myanmar government unilaterally halted the project. This unexpected pause showcased a notable setback in China's "Go Out" investment strategy, sparking global attention (Chan, 2017; Kiik, 2016).

1. Stakeholder Analysis

Chinese Enterprises: The primary investors, infusing substantial financial and technological resources, anticipated lucrative returns.

Myanmar Government: Seeking to propel economic development through the acceptance of investments and infrastructural projects.

Local Community: Vigilant of the dam construction’s impact on their living conditions and the environment.

Environmental Organizations: Focusing on the potential ecological devastation and its far-reaching repercussions.

2. Risk Analysis

Political Risk: Fluctuations in Myanmar's political stability could hinder project execution.

Social Risk: Opposition from local inhabitants might lead to further postponements or cancellation (Chan, 2017; Kirchherr, 2018).

Environmental Risk: The project might have profound impacts on the ecological environment of the Irrawaddy River basin.

Economic Risk: Delays could pose financial losses to the investment.

3. Mitigation Strategies and Outcomes

Policy Communication: Intensified Sino-Myanmar governmental and corporate communication explored collective resolutions, yet societal and political issues led to project suspension.

Environmental Measures: Adoption of advanced environmental technologies and compensation strategies attempted to minimize environmental impacts, albeit eclipsed by the sociopolitical concerns (Kiik, 2016).

4.2.5 Case Study: Jakarta-Bandung High-Speed Railway Project

The Jakarta-Bandung High-Speed Railway Project serves as a pivotal infrastructure development in Indonesia, establishing a swift connection between the nation's capital, Jakarta, and Bandung, the third-largest city in West Java Province. Operated by a joint venture between Chinese and Indonesian companies, the project aspires to notably reduce travel time between the two cities, acting as a catalyst for Indonesia's economic growth. However, the project has encountered a multitude of challenges during its implementation, most notably issues related to land acquisition and loan procurement (Maryani & Abidin, 2022; Negara & Suryadinata, 2018; Purba & Purba, 2020).

1. Stakeholder Analysis

Chinese Enterprises: Principal investors and technological backers, anticipating sustainable profitability.

Indonesian Government: Advocates and administrators of the project, Indonesia seeks to stimulate economic growth through this infrastructural development.

Local Communities: Groups potentially impacted by the project's execution.

Commercial Entities: Anticipating benefits from enhanced transportation links.

2. Risk Analysis

Political Risk: Land acquisition has been a significant impediment to the project's progression (Negara & Suryadinata, 2018), and lackluster local policy support introduces additional challenges.

Economic Risk: The project necessitates substantial financial input and rigorous management, with loan instability also posing a risk.

Technological Risk: High-level technological support and managerial capability are crucial for the project's realization.

3. Mitigation Strategies and Outcomes

Social Communication: Intensifying communication with local communities and orchestrating a reasoned approach to land appropriation and compensation is pivotal. The challenge of land acquisition consistently impedes the project, potentially delaying timelines and inflating costs. In some instances, further negotiations and adjustments may be requisite to ensure smooth project progression.

Financial Management: Establishing a stringent budget and financial management system, while fostering and maintaining positive relations among all stakeholders, is imperative. Sustained financial evaluation and management may be required throughout the project to assure fiscal sustainability.

Technological Collaboration: Capitalizing on the technological expertise provided by the Chinese collaborators will enhance the quality of project construction.

4.3 Cross-Case Comparative Analysis

A cross-case synthesis unveils the recurrent, nuanced patterns and idiosyncrasies apparent across the investigated cases, affording an opportunity to ascertain generalized understandings and discrete, case-specific abnormalities.

Political and Economic Risks: All case studies underscored the permeating implications of political and economic risks. Hambantota Port and Myitsone Dam projects notably highlight the profound impact of political dynamics and pressures on project implementation and ultimate success. The projects in Pakistan and Russia similarly illustrate that even with robust economic planning, unforeseen geopolitical and macroeconomic fluctuations can impose substantial barriers to effective implementation.

Technical and Operational Risks: The cases of the Karot Hydropower Project and the Jakarta-Bandung High-Speed Railway emphasize that technological and operational risks, especially those pertinent to novel or sophisticated technologies and strategic operational management, can present substantial hurdles, even amidst favourable political and economic climates.

Social and Environmental Risks: The Myitsone Dam and Jakarta-Bandung High-Speed Railway projects amplify the imperative to meticulously navigate social and environmental considerations, revealing that underestimating local and environmental resistances can potentially halt even the most strategically planned projects.

Mitigation Strategies: Evidently, mitigation strategies spanned across diplomatic, economic, technical, and community-engagement realms. While debt restructuring and renegotiation have been prevalent in cases like Sri Lanka and Pakistan, in-depth stakeholder communication and collaboration, particularly with local communities, have emerged as salient in almost all cases.

4.3.1 Patterns Across Cases

Robust Financial Strategies: Financial management, particularly pertaining to debt structuring and capital allocation, has emerged as a crucible for successful implementation across all cases.

Stakeholder Engagement: Consistent across every case was the necessity of comprehensive stakeholder engagement, where the integration of local communities, governmental entities, and international partners was indispensable for sustainable project execution. If stakeholders are inadequately involved or receive significantly fewer benefits compared to others, project development is likely to face severe hindrances, as exemplified by the Myitsone Dam Project, which was suspended by the Myanmar government due to public pressure.

Geopolitical Dynamics: Each case underscored the influence of international relations and geopolitical considerations, either as facilitators or barriers, shaping the trajectory of the PPP projects.

4.3.2 Anomalies Across Cases

Degree of Local Resistance: A notable anomaly was the variance in local resistance and its impact on projects. For instance, the Myitsone Dam project was significantly impeded by local and political opposition, while the Karot Hydropower Project managed to substantially mitigate local resistance through community engagement.

Effectiveness of Mitigation Strategies: The efficacy and applicability of mitigation strategies were contextually contingent. Whereas technical and financial mitigations were substantially effective in cases like the Yamal LNG Project, similar strategies did not confer equivalent success in others, like the Jakarta-Bandung High-Speed Railway, revealing a necessity for contextually adapted strategies.

Environmental Prioritization: Environmental considerations displayed a diverse spectrum of influence across cases. While some projects managed to sufficiently address and navigate environmental concerns, others found them to be persistent barriers to successful implementation and operationalization.

4.3.3 Implications

The intricate tapestry of experiences extracted from these cases evokes several implications: An explicit alignment between risks, mitigation strategies, and specific project contexts is paramount for robust project execution.

Future BRI-PPP projects should conscientiously intertwine financial, technical, and sociopolitical strategies, each tailored not merely to the project but also to the specific geopolitical and cultural contexts.

The cross-case analysis substantiates the exigency for further research into developing adaptable, contextually relevant mitigation strategies, particularly addressing underexplored risks identified in the literature review.

4.4 Application of Theoretical Frameworks to Data

4.4.1 Stakeholder Theory Application

Stakeholder Theory asserts that enterprises should not solely create value for shareholders, but should also consider and balance the interests of all stakeholders (Freeman et al., 2010). This theory is of paramount importance in oversea PPP projects, given that such projects generally involve not only governments, investors, and project contractors, but also local community residents, NGOs, and more. With such a diverse range of stakeholders involved, balancing their varying interests becomes a crucial issue. Various case studies and literature reviews have shown that while governments are the most significant influencers in the initiation and

progression of projects, a potentially successful PPP project could be severely impacted by a failure to sufficiently consider the interests of community residents or the demands of NGOs. Additionally, in the context of the BRI, the countries involved in cross-border PPPs may significantly vary, resulting in distinct stakeholders for each project.

Therefore, aligning the Stakeholder Theory with PPP under the BRI framework, to ensure the smooth progression of a project, it's imperative to first identify all the involved stakeholders and analyze their respective interests and needs. Subsequently, through proactive communication and collaboration, it's crucial to balance these varying interests. Building upon the analysis of stakeholders, formulate strategies tailored to meet their needs and maintain equilibrium among all parties. Once the project is underway, there should be regular monitoring of stakeholders' needs and satisfaction levels, with periodic assessments of the progress of project and timely strategy adjustments to guarantee its success. For instance, in the Hambantota Port Project, political pressures were inextricably linked to the stakeholders' roles, involving both local government entities and international actors. The emphasis on debt restructuring and multilateral cooperation reveals how stakeholder interests, particularly from financing entities, can drive strategy. Different stakeholders, including local communities, government bodies, and international investors, introduce diverse, sometimes conflicting, interests and sources of influence that need adept management to secure project sustainability and avoid potential conflicts (Yang et al., 2016).

4.4.2 Risk Management Theory Application

Risk Management Theory postulates that risk identification, risk assessment, risk mitigation, and risk monitoring are essential steps in a systematic analytical process. In engineering projects, risk management should be a continuous process, requiring organizations to incessantly identify and analyze new risks and adjust their risk mitigation strategies to adeptly cope with the ever-changing environment. Through the lens of Risk Management Theory (Hopkin, 2013), a detailed analysis of the previously mentioned cases, such as the Karot Hydropower Project in Pakistan, can be undertaken to meticulously examine the identified risks and the subsequent

mitigation strategies adopted. Economic and technical challenges were both anticipated and addressed through debt renegotiation and technical cooperation, unveiling the crucial role of preventative risk identification and management in ensuring the smooth progression of each project stage (Zou et al., 2007).

However, while risk identification and mitigation played crucial roles and indeed provided significant support for the Karot Hydropower Project in Pakistan, the aspects of risk assessment and risk monitoring might not have received adequate attention. This insufficiency indirectly contributed to the failure of the Myitsone Dam project in Myanmar. The proponents of the Myitsone Dam project, as an overseas PPP initiative, were aware of the risks arising from local cultural, political, and geographical differences. However, their insufficient risk assessment and the lack of a robust risk monitoring system led to an escalation of public opposition, ultimately halting the project's progress.

4.4.3 Synthesis of Theoretical Insights

Given the highly complex and substantial nature of Belt and Road Initiative (BRI) PPP projects, it is necessary to integrate different theories to mitigate avoidable risks as much as possible. Synthesizing the aforementioned Risk Management Theory and Stakeholder Theory can bring about a more comprehensive and profound effect on engineering project management.

Specifically, comprehensive risk identification and assessment: Stakeholder Theory emphasizes communication and cooperation with all stakeholders, including project teams, clients, suppliers, governments, and communities. Through communication with these stakeholders, more potential risk factors can be identified, including political, legal, environmental, and social risks. In terms of risk assessment, feedback from stakeholders can help the project team more accurately judge the severity of the risk and the likelihood of its occurrence, thereby formulating more appropriate risk response strategies.

More effective risk mitigation: During the risk mitigation process, communication and cooperation with stakeholders can help the project team better understand the needs and expectations of stakeholders, thereby taking more effective measures to reduce or eliminate risks. At the same time, through the participation of

stakeholders, the project team can share risks, utilize the resources and experience of stakeholders, and handle risks better.

Increased project acceptability: Communication and cooperation with stakeholders can better meet the needs and expectations of stakeholders, thereby increasing the acceptability of engineering projects. Considering the opinions and suggestions of stakeholders in the design and execution of engineering projects can help improve project quality and results, avoiding potential obstacles and conflicts.

Higher project success rate: The active participation and support of stakeholders can increase the probability of success of engineering projects. At the same time, the effective implementation of risk management can help prevent and address potential risks, ensuring the smooth progress of the project.

Improved project social impact: Considering the needs and expectations of stakeholders can help improve the social impact of engineering projects and enhance project social responsibility. At the same time, effective risk management can reduce the negative impact of engineering projects on the environment and society, achieving more sustainable development.

In summary, this integration results in a dual-oriented approach that can not only handle the complexity of stakeholders' interests and impacts (Beringer et al., 2013) but also skillfully cope with potential risks through effective risk identification and mitigation strategies (Yang et al., 2009), addressing the various challenges brought about by the international investment landscape.

4.5 Conclusion

Embarking upon a meticulous exploration of China’s overseas PPPs within the substantial framework of the BRI, this chapter has unrolled a spectrum of complexities, revealing an intricate tapestry of risks and mitigation strategies that unfold in international investment and collaboration. The literature review manifestly outlined seven risk categories, including political, economic, social, geographical, operational, technical, and legal aspects, intricately woven into the practicality of BRI-PPP projects. An astute observation from the academic scrutiny signals a

predominant emphasis on political, economic, and social risks in current research while seemingly underestimating technical risks and emergency planning strategies.

Through a prism of five discerning case studies, varied risk factors—financial, political, operational, technical, and environmental—were illustrated, demonstrating their palpable influence in shaping the trajectory of PPP projects under BRI. Practicality and theory merged as the case studies not only anchored the conceptual understanding of risks and mitigations derived from literature but also underscored the paramountcy of strategic alignment with local contexts and international relations, particularly emphasizing the necessity of comprehensive stakeholder engagement and proactive risk mitigation.

Furthermore, the application of Stakeholder Theory and Risk Management Theory bridged theoretical analysis with real-world implications, underscoring the utility and applicability of theoretical frameworks in navigating the vast and varied landscape of international PPP projects. The synthesis of both theories not only illuminated the interconnected dynamics among stakeholders and potential project risks but also paved a pathway towards a coherent understanding and formulation of risk mitigation strategies and stakeholder management practices, which are integral to ensuring the robustness and mutual benefits of investments and collaborations within the BRI context.

Conclusively, the investigations and analyses permeating through this chapter advocate for a harmonious alignment between scholarly research and on-the-ground realities, emphasizing a holistic approach that melds theoretical insights with practical applications. Such a paradigm invites a more strategic navigation through the multifaceted challenges and opportunities propounded by global partnerships, urging future research to delve deeper into underrepresented risks and solutions, especially placing a magnifying glass upon technical risks and emergency planning strategies, to perpetuate a more holistic, robust, and mutually beneficial international investment and collaboration landscape.

CHAPTER 5
Conclusion

5.1 Summary of Research Findings

The present study has executed a meticulous inquiry into the risk associated with Public-Private Partnership (PPP) projects within the framework of China's Belt and Road Initiative (BRI). A comprehensive examination of the literature, spanning both Mandarin and English publications, has yielded a detailed delineation of risks encompassing political, economic, and social spheres. Notably, political risks, such as fluctuations in government stability and policy environment changes, along with economic and social risks characterized by financing structures and cultural acceptance, have been frequently cited in scholarly debates.

Mitigation strategies unearthed through this study are diverse and encompass policy support, in-depth risk assessment, and diligent management across all project phases. Simplification of bureaucratic procedures, equitable profit distribution, professional development, legislative advancements, and strategic contingency planning are pivotal for the favorable evolution of BRI-PPP projects. This study's evidence-based findings, through the examination of case studies like the Karot Hydropower Project in Pakistan and the Yamal LNG Project in Russia, are instrumental in validating the identified risk mitigation strategies.

The findings of this research are in concordance with the research questions posed at the outset, elucidating the multifaceted risk concerns, and affirming the importance of comprehensive risk factor comprehension, as outlined in the research objectives. Furthermore, the applicability of theoretical constructs such as stakeholder theory and risk management theory within international PPP arrangements has been scrutinized, fulfilling the research's aim to bridge theoretical principles with practical application.

In conclusion, Objective 2 of this study has illuminated the complex landscape of risk management in China's overseas PPPs within the BRI framework. The analysis, grounded in a thorough literature review and case studies, identified seven core risk categories: political, economic, social, geographical, operational, technical,

and legal. Significantly, the findings indicate a disproportionate focus in current literature and practices on political, economic, and social risks, often to the neglect of equally critical technical risks and emergency planning strategies. The case studies vividly demonstrate how these varied risks, particularly financial, political, operational, technical, and environmental, critically shape the trajectory of PPP projects. This disparity in risk emphasis underscores the need for a more balanced approach to risk assessment and mitigation in future BRI-PPP endeavors, suggesting that practitioners should broaden their risk management strategies to encompass less emphasized but equally vital areas such as technical preparedness and emergency response.

5.2 Discussion and Recommendations

The synthesis of findings from this study offers a comprehensive roadmap for enhancing the success of BRI-PPP projects. Based on the findings of the previous chapters and with a strategic foresight, I will discuss and analyze from the perspectives of practitioners, policymakers, and future academic researchers, and offer recommendations accordingly.

5.2.1 For Practitioners

1. Enhancing Integrated Risk Management: Practitioners must craft comprehensive risk management frameworks that are not siloed by individual risk categories but are integrative of political, economic, social, technological, and environmental facets (Kardes et al., 2013; Loosemore & Cheung, 2015). This study contributes to the field by suggesting such frameworks be adaptive, aligning them closely with project-specific conditions and the nuances of local contexts. This aligns with our findings that local integration, a nuanced understanding of cultural and social norms, is paramount to reducing social risk and bolstering community acceptance.

2. Stakeholder Engagement: the analysis makes a substantial contribution to stakeholder engagement practices. The success of BRI-PPP projects, as underscored by stakeholder theory, hinges on effective engagement throughout the project lifecycle (Mok et al., 2015; Yang et al., 2011). The creation of shared value and robust communication strategies, as recommended by this study, can mitigate

risks linked to social and political dissent. This is not a hollow admonition; it is a strategic imperative backed by empirical data.

3. Technical Risk Preparation: Contrary to the underemphasis in existing literature, this research highlights the importance of technical risk management. Practitioners are urged to embrace cutting-edge technology and invest in skill enhancement, a recommendation that stems from the findings from this study on the criticality of technical proficiency in the face of emergent risks.

4. Strategic Political and Financial Planning：Drawing lessons from the Hambantota Port project, this study contribute strategic insights into the necessity of sophisticated partnerships and debt management (Wibisono, 2019). These strategies are not merely abstract concepts but concrete mechanisms to mitigate financial and political risks.

5.2.2 For Policymakers

1. Policy Support: Policymakers should establish a conducive policy environment, offering the clarity and stability essential for the success of PPP projects.

2. International Cooperation: Policies should encourage international technical cooperation and financial restructuring, considering experiences from significant projects like the Jakarta-Bandung high-speed rail and the Hambantota Port (Osei-Kyei & Chan, 2015; Purba & Purba, 2020).

3. Sustainability and Responsibility: Incentives for projects prioritizing environmental sustainability and social responsibility should align with global sustainable development goals (Oke et al., 2019).

5.2.3 For future research：

5.2.3.1 Comprehensive Assessment of Technical Risks and Emergency Response Mechanisms

Future PPP projects should establish a system for dynamic monitoring of technical risks. This system needs to integrate the latest advancements in big data analytics and artificial intelligence to predict potential technical failures and market fluctuations, thus achieving early risk identification and rapid response (Cerchiello &

Giudici, 2016; Shakya & Smys, 2021). Furthermore, by building an international network of technical experts, timely and efficient technical support can be provided for PPP projects, fostering the international exchange and collaboration of knowledge and skills.

The establishment of an emergency response mechanism is crucial for PPP projects. During project planning and execution, an adaptive emergency response plan should be designed to ensure that the project can maintain operations and recover when facing uncertainties and external shocks. The flexibility of emergency funds and resource allocation should also be considered early in the project to ensure continuity and stability in crisis situations (Hopkin, 2018).

5.2.3.2 Building a Diversified Risk Management Cooperative Network

A risk management cooperative network is key to mitigating risks in PPP projects. Government bodies, private sector entities, academic institutions, and international organizations should jointly participate in the establishment and refinement of risk management systems. Establishing a comprehensive risk management mechanism through information sharing and collaborative agreements is essential (Gil & Tether, 2011). Developing an international standard for risk management processes is significant for enhancing the awareness and capabilities of various stakeholders in managing risks (Osei-Kyei & Chan, 2017).

Another key factor to the success of projects is the broad participation of all stakeholders. Providing risk management training, particularly for local community members, staff, and project management teams, can enhance their awareness and ability to manage risks. Implementing community engagement programs not only can improve integration between the project and local communities but also can increase community support and recognition of the project.

5.2.3.3 Enhancing Risk Transparency and Strategic Adaptability

To ensure that stakeholders have a clear understanding of risks in PPP projects, it is essential to enhance the transparency of risk reporting. Utilizing internet and mobile technology platforms can effectively facilitate real-time updates and sharing of risk information, allowing parties to stay informed about project progress and potential risk points promptly. Additionally, simplifying the interpretation of risk

data through visualization aids in improving the understanding and utilization of risk information by non-specialists.

Considering the transnational nature of the Belt and Road Initiative, strategic adaptability and diversity are particularly crucial. Strategies and plans for PPP projects should be flexible enough to respond to rapid changes in political, legal, and market environments. Project designs should consider the diversity of financing and technical solutions to ensure preparedness for future uncertainties (Zou et al., 2007).

5.2.3.4 Integrating Local Knowledge with International Expertise

Local knowledge and culture are critical to the success of PPP projects. PPP initiatives should integrate local social, cultural, environmental, and technical characteristics to design risk management measures adapted to local conditions. By combining local expertise with international experience, projects are more likely to succeed and promote local socio-economic development.

Under the framework of the Belt and Road Initiative, an international cooperation and exchange platform for PPP projects should be established. Through this platform, best practices worldwide can be shared, and it also provides an opportunity for learning and collaboration among PPP projects from different nations (Cheung et al., 2009; Shen et al., 2006). Moreover, exploration of cooperation with international financial institutions is necessary to secure the required financial support and professional guidance.

5.3 Limitations of the Study

While this study has provided substantial insights into the risk and mitigation strategies within BRI-PPP projects, it is important to acknowledge its limitations.

5.3.1 Scope of Literature Review

The literature review, albeit comprehensive, has been confined to accessible and published articles and reports in English and Chinese. There remains a possibility that relevant studies published in other languages or grey literature such as unpublished theses or internal reports could offer additional insights. Furthermore, the

review may also be subject to publication bias, where studies with positive findings are more likely to be published than those with negative or inconclusive results.

5.3.2 Frequency of Risk Types

The analysis revealed that political, social, and economic risks were more frequently discussed in the literature than others, such as technical risks. This could indicate a skew in the attention given to certain risks within academic and practical realms, potentially overshadowing other critical risks that require further investigation.

5.3.3 Case Study Selection

Case studies were selected based on their relevance and the availability of data, which means that they may not cover the entire spectrum of BRI-PPP projects. The chosen cases provided significant lessons but are not exhaustive in demonstrating the range of risks and mitigation strategies. Moreover, the findings from these case studies may not be universally applicable to all BRI-PPP projects due to the unique geopolitical and economic conditions of each project.

5.3.4 Theoretical Framework Application

The application of stakeholder and risk management theories provided a structured approach to understanding the complexities of international PPP projects. However, the integration of these theories could have overshadowed other theoretical perspectives that might offer different insights. For example, institutional theory or the theory of planned behavior could also have been relevant in examining the motivations behind stakeholder actions and risk mitigation.

5.3.5 Might not be applicable to PPP projects in other countries

The focus on Chinese overseas PPP projects under the BRI framework provided depth but also limited the study's scope. The findings and implications are particularly tailored to the BRI context and may not reflect PPP practices and experiences in other countries.

5.4 Conclusion

This research concludes with a synthesis of insights garnered from an extensive analysis of risks and their corresponding mitigation strategies within the BRI-PPP projects. The investigation has elucidated a complex network of risks, with a predominant emphasis on the political aspect, while also addressing economic, social, technological, operational, and legal dimensions. The case studies exemplify the imperative of proficient management of political and economic uncertainties, which is quintessential for the fruition of such endeavors.

While technical and operational risks may not be at the forefront of discourse, their significance is underscored by the specific challenges they present, as evidenced in projects like the Karot Hydropower and the Jakarta-Bandung High-Speed Railway. Equally, social and environmental factors command a critical position, given that overlooking these aspects can precipitate project failure.

In aligning theoretical frameworks with empirical findings, the study has underscored the pertinence of Stakeholder Theory and Risk Management Theory as fundamental to the effective governance of BRI-PPP projects. This duality of approach is indispensable for ensuring the equilibrium of stakeholder interests and the meticulous orchestration of risk mitigation.

While the study has been comprehensive, it acknowledges the inherent limitations in capturing the full complexity of BRI-PPP projects. Nonetheless, it offers a strategic roadmap for stakeholders, practitioners, and policymakers engaged in navigating the intricate topography of international PPPs. The findings contribute substantively to the corpus of knowledge in PPP risk management and propose a paradigm for the cultivation of more resilient and sustainable infrastructure development at the global stage.

REFERENCES

ADB. (2021). Public-Private Partnership Handbook.

Akintoye, A., Hardcastle, C., Beck, M., Chinyio, E., and Asenova, D. (2003). "Achieving best value in private finance initiative project procurement." **Construction Management and Economics**, 21, 5: 461–470.

Bennett, J., and Iossa, E. (2006). "Building and managing facilities for public services." **Journal of Public Economics**, 90, 10–11: 2143–2160.

Bennett, M. M. (2016). "The silk road goes north: Russia's role within China's Belt and Road Initiative." **Area Development and Policy**, 1, 3: 341–351.

Beringer, C., Jonas, D., and Kock, A. (2013). "Behavior of internal stakeholders in project portfolio management and its impact on success." **International Journal of Project Management**, 31, 6: 830–846.

BFTD. (2019). **The significance, risks and countermeasures of the PPP model in promoting the construction of the "Belt and Road"**. accessed. available from http://12335.mofcom.gov.cn/article/alpx/201905/1925244_1.html

Bing, L., Akintoye, A., Edwards, P. J., and Hardcastle, C. (2005). "The allocation of risk in PPP/PFI construction projects in the UK." **International Journal of Project Management**, 23, 1: 25–35.

Butt, M. J. (2021). "A comparative analysis of the environmental policies in China and Pakistan: developing a legal regime for sustainable China-Pakistan economic corridor (CPEC) under the Belt and Road Initiative (BRI)." **IPRI Journal**.

Carrai, M. A. (2018). "China's Malleable Sovereignty along the Belt and Road Initiative: The Case of the 99-Year Chinese Lease of Hambantota Port." **NYUJ Int'l L. & Pol.**, 51: 1061.

Cerchiello, P., and Giudici, P. (2016). "Big data analysis for financial risk management." **Journal of Big Data**, 3, 1: 1–12.

Chan, D. S. W. (2017). "Asymmetric bargaining between Myanmar and China in the Myitsone Dam controversy: social opposition akin to David's stone against Goliath." **The Pacific Review**, 30, 5: 674–691.

Cheung, E., and Chan, A. P. C. (2011). "Evaluation model for assessing the suitability of public-private partnership projects." **Journal of Management in Engineering**, 27, 2: 80–89.

Cheung, E., Chan, A. P. C., and Kajewski, S. (2009). "Enhancing value for money in public private partnership projects: Findings from a survey conducted in Hong Kong and Australia compared to findings from previous research in the UK." **Journal of Financial Management of Property and Construction**, 14, 1: 7–20.

CliffordChance. (2019). "BELT AND ROAD: HOW CAN PPPs HELP?".

Defraigne, J.-C. (2021). "The Eurasian Economic Union and the challenge of the BRI: A comparison of their respective impacts on economic development and Russia's regional leadership." **Eurasian Geography and Economics**, 62, 5–6: 659–698.

Fombad, M. C. (2015). "Governance in public–private partnerships in South Africa: Some lessons from the Gautrain." **Journal of Southern African Studies**, 41, 6: 1199–1217.

Freeman, R. E., Harrison, J. S., Wicks, A. C., Parmar, B. L., and De Colle, S. (2010). **Stakeholder theory: The state of the art**.

Gil, N., and Tether, B. S. (2011). "Project risk management and design flexibility: Analysing a case and conditions of complementarity." **Research Policy**, 40, 3: 415–428.

GlobalData. (2023). **Power plant profile: Karot, Pakistan**. accessed. available from https://www.power-technology.com/data-insights/power-plant-profile-karot-pakistan/?cf-view

HM. Treasury. (2019). **Private Finance Initiative and Private Finance 2 Projects: 2018 Summary Data**. Report, March.

Hopkin, P. (2013). **Risk management**.

———. (2018). **Fundamentals of risk management: understanding, evaluating and implementing effective risk management**. Kogan Page Publishers.

Huang, Y. (2016). "Understanding China's Belt & Road initiative: motivation, framework and assessment." **China Economic Review**, 40: 314–321.

IOSC. (2023). **Building the "Belt and Road": A Major Practice for Building a Community of Human Destiny**. accessed. available from https://www.fmprc.gov.cn/chn/gxh/tyb/zyxw/202310/t20231010_11158751.html

Iossa, E., and Martimort, D. (2015). "The simple microeconomics of public-private partnerships." **Journal of Public Economic Theory**, 17, 1: 4–48.

Kardes, I., Ozturk, A., Cavusgil, S. T., and Cavusgil, E. (2013). "Managing global megaprojects: Complexity and risk management." **International Business Review**, 22, 6: 905–917.

Katysheva, E. G. (2019). "Developing gas fields in the Yamal Peninsula as a factor of economic development of the Arctic Zone of Russia." **IOP Conference Series: Earth and Environmental Science**, 302, 1: 12127.

Khan, Z., Changgang, G., and Afzaal, M. (2020). "China-Pakistan economic corridor at the cross intersection of China, Central Asia and South Asia: Opportunities for regional economic growth." **The Chinese Economy**, 53, 2: 200–215.

Kiik, L. (2016). "Nationalism and anti-ethno-politics: why 'Chinese Development'failed at Myanmar's Myitsone Dam." **Eurasian Geography and Economics**, 57, 3: 374–402.

Kim, T., Lee, S. J., and Pradeep, M. (2019). "Strengthening Public-Private Partnership in Sri Lanka's Infrastructure Development Project: The Colombo Port Case." **Asian International Studies Review**, 20, 1: 91–120.

Kong, L. (2023). "Risk Management of the "Belt and Road Initiative" Projects–An Empirical Study on Investments of the Chinese State-Owned-Banks in the Region."

Lai, Y., Tong, T., and Hu, X. (2021). "Problems and Countermeasures of Hungary Serbia Railway Project in" One Belt, One Road"." **Management Science and Research**, 10, 1.

Lei, X. (2017). "Legal Risks and Risk Prevention of PPP Model under Belt and Road Strategy." **Legal System and Society**, 05: 97–98.

Li, B., Zhang, L., and Zhou, C. (2020). **Research on Contract Risk Identification for Chinese Construction Enterprises "Going Global" Under the Background of "The Belt and Road Initiative."**. 4th International Symposium on Business Corporation and Development in South-East and South Asia under B&R Initiative (ISBCD 2019).

Li, J., Dong, X., Jiang, Q., and Dong, K. (2021). "Analytical approach to quantitative country risk assessment for the Belt and Road initiative." **Sustainability**, 13, 1: 423.

Liang, J., Carrai, M. A., Malik, A. A., Gao, X., Gao, X., Feng, L., and Huang, K. (2023). **The Climate Risks of Global China: Measuring Rising Heat and Flood Risk Along the Belt-and-Road Initiative**.

Liang, S. (2020). "Core Issues of PPP Projects of Chinese Enterpeise within the Belt & Road Initiative." **Joumal of Hubei University of Education**, 37, 11: 45–50.

Liao, S., Xiao, Y., and Liu, Z. (2019). "Risks and Countermeasures of PPP Project of "the Belt and Road" Infrastructure." **CONSTRUCTION ECONOMY**, 40, 11: 9–13.

Loosemore, M., and Cheung, E. (2015). "Implementing systems thinking to manage risk in public private partnership projects." **International Journal of Project Management**, 33, 6: 1325–1334.

Luo, Z., Li, J., Wu, Z., Li, S., and Bi, G. (2022). "Investigating the Driving Factors of Public Participation in Public-Private Partnership (PPP) Projects—A Case Study of China." **International Journal of Environmental Research and Public Health**, 19, 9: 5192.

Lv, S. (2022). "Risks and Optimal Paths of PPP Financing Models under "Belt and Road."." **Fortune Today**, 03: 1–3.

Ma, J., and Xu, M. (2022). "Risk Response Strategies for Offshore Rail Transportation PPP Projects." **International Project Contracting & Labour Service**, 06: 77–78.

Maryani, D., and Abidin, Z. (2022). "JAKARTA-BANDUNG HIGH-SPEED TRAIN INFRASTRUCTURE DEVELOPMENT." **Jurnal Ilmiah Administrasi Pemerintahan Daerah**, 14, 1: 162–179.

Matt, F., and Anarkalee, P. (2019). **Unsustainable Chinese Infrastructure Deals Are Not the Fault of One Party**. available from https://carnegieendowment.org/2019/08/19/zh-pub-79681

Merna, T., and Njiru, C. (2002). Financing infrastructure projects. In T. Telford (Ed.).

Mok, K. Y., Shen, G. Q., and Yang, J. (2015). "Stakeholder management studies in mega construction projects: A review and future directions." **International Journal of Project Management**, 33, 2: 446–457.

Negara, S. D., and Suryadinata, L. (2018). **Jakarta-bandung high speed rail project: Little progress, many challenges**. ISEAS-Yusof Ishak Institute Singapore.

Niu, Y., and Yang, G. (2023). **Exploring the Path of Chinese-style Modernization | Promoting High-Quality Development of the Belt and Road Initiative (in Chinese)**. available from http://politics.people.com.cn/n1/2023/0220/c1001-32627500.html

O'Toole, R. (2022). Distinguishing Between Demand Risk and Availability Payment Public-Private Partnerships. In **Handbook on Public Private Partnerships in Transportation** (Vol. I: Airports, Water Ports, Rail, Buses, Taxis, and Finance, pp. 305–311).

Oke, A., Aghimien, D., Aigbavboa, C., and Musenga, C. (2019). "Drivers of sustainable construction practices in the Zambian construction industry." **Energy Procedia**, 158: 3246–3252.

Osei-Kyei, R., and Chan, A. P. C. (2015). "Review of studies on the Critical Success Factors for Public–Private Partnership (PPP) projects from 1990 to 2013." **International Journal of Project Management**, 33, 6: 1335–1346.

———. (2017). "Implementing public–private partnership (PPP) policy for public construction projects in Ghana: critical success factors and policy implications." **International Journal of Construction Management**, 17, 2: 113–123.

Porter, M. E. (2008). "The five competitive forces that shape strategy." **Harvard Business Review**, 86, 1: 78.

Purba, A., and Purba, J. T. (2020). "Jakarta-Bandung High-Speed rail transportation project: facts and challenges." **IOP Conference Series: Materials Science and Engineering**, 918, 1: 12034.

Roehrich, J. K., Lewis, M. A., and George, G. (2014). "Are public–private partnerships a healthy option? A systematic literature review." **Social Science & Medicine**, 113: 110–119. doi:10.1016/j.socscimed.2014.03.037

Shakya, S., and Smys, S. (2021). "Big data analytics for improved risk management and customer segregation in banking applications." **Journal of ISMAC**, 3, 3: 235–249.

Shen, L.-Y., Platten, A., and Deng, X. P. (2006). "Role of public private partnerships to manage risks in public sector projects in Hong Kong." **International Journal of Project Management**, 24, 7: 587–594.

Sibo, G., and Choudhary, A. (2018). **Belt and Road PPP Alchemy - Was the Silk Road Paved with Gold?**

Sun, J. (2017). **Risk Sharing and Risk Evasion Path Selection in "The Belt and Road" PPP Model**. PROCEEDINGS OF THE FOURTH INTERNATIONAL SYMPOSIUM - MANAGEMENT, INNOVATION & DEVELOPMENT, BK ONE & TWO (Issues 4th International Symposium-Management, Innovation and Development, pp. 1011–1016).

The World Bank. (2022). **What are Public Private Partnerships?**. available from https://ppp.worldbank.org/public-private-partnership/overview/what-are-public-private-partnerships

———. (2023). **PPP Arrangements/Types of PPP Agreements**. available from https://ppp.worldbank.org/public-private-partnership/agreements

Wang, Z., Bai, S., and Guo, Y. (2021). "Research on Investment Risks and Countermeasures of "Belt and Road" Infrastructure PPP Project: A Case Study of Southeast Asian Countries." **Journal of Engineering Management**, 35, 5: 88–93.

Wibisono, A. N. (2019). "China's "Belt and Road Initiative" in Sri Lanka: Debt Diplomacy in Hambantota Port Investment." **Mandala: Jurnal Ilmu Hubungan Internasional**, 2, 2.

Wijesinha, A. (2021). Sri Lanka as a Commercial Hub in the Indian Ocean: The Role of Domestic Trade and Competitiveness Reforms. In **World Scientific** (pp. 97–110): Maritime Sri Lanka: HISTORICAL AND CONTEMPORARY PERSPECTIVES.

Xiang, Y., Zhang, Q., Wang, D., and Wu, S. (2022). "Mining Investment Risk Assessment for Nations along the Belt and Road Initiative." **Land**, 11, 8: 1287.

Xu, Y., Yeung, J. F. Y., Chan, A. P. C., Chan, D. W. M., Wang, S. Q., and Ke, Y. (2010). "Developing a risk assessment model for PPP projects in China—A fuzzy synthetic evaluation approach." **Automation in Construction**, 19, 7: 929–943.

Yang, J., Shen, G. Q., Ho, M., Drew, D. S., and Xue, X. (2011). "Stakeholder management in construction: An empirical study to address research gaps in previous studies." **International Journal of Project Management**, 29, 7: 900–910.

Yang, J., Shen, Q., and Ho, M. (2009). "An overview of previous studies in stakeholder management and its implications for the construction industry." **Journal of Facilities Management**, 7, 2: 159–175.

Yang, R. J., Zou, P., W., X., and Wang, J. (2016). "Modelling stakeholder-associated risk networks in green building projects." **International Journal of Project Management**, 34, 1: 66–81.

Yescombe, E. R. (2011). "Public-private partnerships: principles of policy and finance." **Elsevier**.

Yu, Y., Chan, A. P. C., Chen, C., and Darko, A. (2018). "Critical Risk Factors of Transnational Public–Private Partnership Projects: Literature Review." **Journal of Infrastructure Systems**, 24, 1. doi:10.1061/(asce)is.1943-555x.0000405

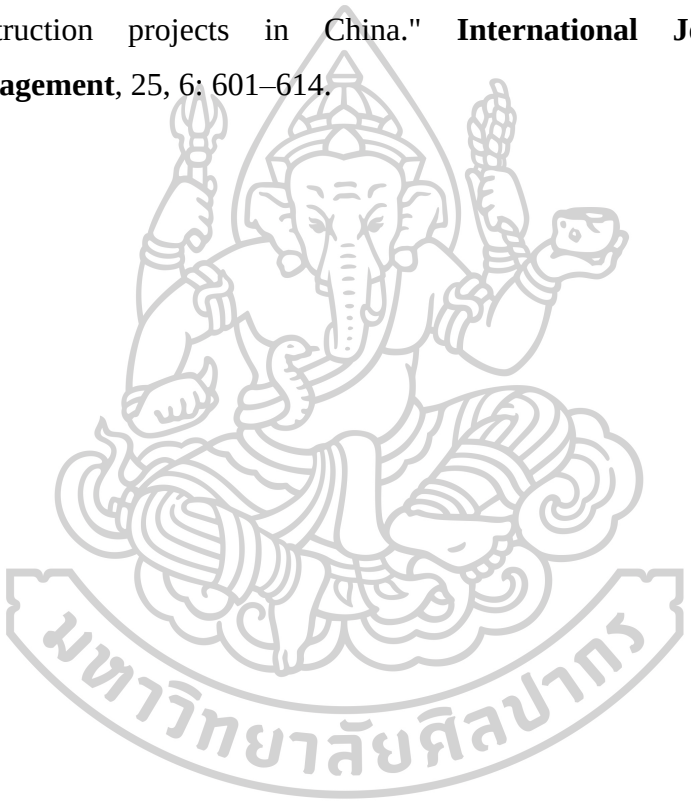
Zhang, S., Chan, A. P. C., Feng, Y., Duan, H., and Ke, Y. (2016). "Critical review on PPP Research–A search from the Chinese and International Journals." **International Journal of Project Management**, 34, 4: 597–612.

Zhang, X. (2005). "Critical success factors for public–private partnerships in infrastructure development." **Journal of Construction Engineering and Management**, 131, 1: 3–14.

Zhao, S., Yang, K., and Long, L. (2018). **There are four major risks associated with the PPP model in the "Belt and Road" infrastructure development**. accessed. available from https://www.sohu.com/a/285278648_731021

Zhou, H. (2018). China, securing "belt and road initiative": risk management. In **Securing the Belt and Road Initiative: Risk Assessment, Private Security and Special Insurances Along the New Wave of Chinese Outbound Investments** (pp. 163–177).

Zou, P. X. W., Zhang, G., and Wang, J. (2007). "Understanding the key risks in construction projects in China." **International Journal of Project Management**, 25, 6: 601–614.



VITA

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