Proceedings of the 8th International Conference on Economic Management and Green Development
DOI: 10.54254/2754-1169/116/20242476

Research on the Risk Management of International Engineering Project Financing

Jiayi Yang[1,a,*]

[1]*Department of Finance and Economics, Zhuhai College of Science and Technology, Zhuhai, China*
a. yang0916@stu.zcst.edu.cn
**corresponding author*

Abstract: Against the backdrop of the "Going Global" strategy's continuous advancement and the rapid integration of the international economy, China's development prospects in the realm of international engineering contracting and investment appear highly promising. Currently, in the implementation of international engineering projects, construction contracting enterprises regularly participate in project financing to alleviate funding challenges faced by project owners. Within the context of international engineering project financing, an array of risks is inevitably encountered. Among these, the most prominent risks include political, legal, market, performance, economic, construction, and operational risks, among others. Through the analysis of various risk factors presented in this paper, the aim is to enhance the understanding of international engineering contractors regarding the intricacies of these multifaceted risk elements. Subsequently, corresponding mitigation strategies are proposed to empower project operators in effectively managing and guarding against these multifaceted risks.

Keywords: International Projects, Financing Risk, Risk Management

1. Introduction

In the current context of China's deepening commitment to the "Going Global" strategy, particularly concerning infrastructure development in countries along the Belt and Road Initiative (BRI), which necessitates substantial financial backing, the mobilization of capital is intricately intertwined with various aspects of international construction projects. The market for international engineering contracting is confronted with a dual landscape of novel opportunities and challenges. On one hand, it capitalizes on the historical window offered by the BRI to strategically expand its international footprint and enhance service offerings. On the other hand, an array of uncertainties, both exogenous and endogenous, give rise to numerous financing risk factors. Hence, conducting a rational assessment and analysis of the financing risks inherent in international engineering construction projects, and subsequently formulating innovative countermeasures atop existing risk mitigation frameworks, is an urgent imperative for international engineering contractors seeking to effectively preclude and circumvent such risks in their endeavors.

Amid China's rapid economic growth and deepening internationalization, accelerating global processes have intensified competition in the international engineering contracting market, necessitating enterprises to adopt rigorous, scientific methods to identify and mitigate various risks. This paper aims to systematically examine the principal financing risks encountered in international

DOI: 10.54254/2754-1169/116/20242476

engineering projects, grounded in practical circumstances, along with corresponding mitigation strategies.

Scholarly attention has been devoted to the study of international project financing risks, resulting in a relatively rich body of literature that explores this multifaceted domain.Hou & Sun analyze ODI risks faced by Chinese enterprises, proposing mitigation strategies [1]. Qu & Han explore BRI financial risks from the standpoints of inherent financial sector risks and evolving demand, pinpointing currency, credit, reputation, and investment-related risks [2]. Wang emphasizes credit, currency, and market risks [3]. Huang proposes risk-sharing and mitigation measures involving multiple stakeholders, considering project financing specifics and China's context [4]. Cheng offers qualitative guidance for managing exchange rate and interest rate risks via measures like fixed exchange rate contracts, favorable invoicing, derivatives, and fixed-rate loans with interest-rate swaps/futures/options [5]. Bohara reveals how exchange rate fluctuations stimulate international trade but impact developed and developing countries differently, with variations within developing regions [6]. Mahamid & Ibrahim identify exchange rate risk as a leading cause of cost overruns due to increased material, equipment, labor, and potential financing costs [7]. Ma S advocates managing exchange rate risk through competitiveness, refined risk management, and strategic use of financial tools [8]. Hyung Han & Change F stress the importance of exchange rate prediction for cash flow and revenue management, exploring historical data and expert-based forecasting methods [9, 10]. Niu presents an integrated system for international project financing risk prevention and control, encompassing organizational, technical, institutional, and procedural aspects [11]. Cai assesses financing risk factor weights using case studies of an apartment complex in Sabah, Malaysia, and a Marriott resort in Phuket, Thailand [12]. Sun & Zhu, in response to debt crises, propose a new financing model leveraging accounts receivable transfer to expedite fund recovery and mitigate international engineering financing risks [13].

2. Principal Financing Risks in International Engineering

2.1. Political Risk

Political risk arises from factors such as war, unstable international conditions, regime changes, and policy adjustments, leading to the impairment of project assets and interests. This risk can be bifurcated into stability risks related to political regimes and policy stability.

2.2. Legal Risk

Legal risk is engendered by host country legal changes impacting the project, manifesting in

1. the presence of a robust legal framework for dispute resolution;
2. the independence of the judiciary and effective enforcement of legal decisions;
3. whether host country laws facilitate the establishment of a sound financing structure and ensure smooth post-construction operations.

2.3. Economic Risk

Economic risk encompasses the following three aspects:

1. Exchange Rate Risk: When projects settle in local currency and must be repaid in hard currency, depreciation of the local currency necessitates more of it to acquire hard currency for repayment, thereby reducing project returns.
2. Interest Rate Risk: Fluctuations in interest rates directly influence project value or earnings.
3. Inflation Risk: Inflation-driven increases in costs (raw materials, labor) may elevate construction costs, impede product sales, and heighten repayment pressures.

DOI: 10.54254/2754-1169/116/20242476

2.4. Market Risk

The market risk stems from the interplay of commercial environment risk and demand risk, concerning the maintenance of product quality, output, and resilience to market price fluctuations that affect profits.

2.5. Contractual Risk

Performance risk involves owner credit risk and contractor performance capability risk. The former focuses on an owner's financial status, debt-servicing capacity, professional competence, and credibility, particularly challenging when assessing government owners or public utility companies. The latter concerns a contractor's construction capability, expertise, funding capacity, and financing ability.

2.6. Construction Risk

Construction risk primarily consists of completion risk and cost risk:

1. Completion Risk: Technological or other issues may result in project non-completion, delay, failure to meet designed technical-economic indicators, excessive construction costs, or even complete suspension, constituting a core financing risk throughout the construction and trial production phases.
2. Cost Risk: Excessive cost escalations triggered by political or economic risks can disrupt the project financing arrangement, potentially causing costs to far exceed budget.

2.7. Operational Risk

Operational risk refers to the risk where the market value of products produced after project operation is insufficient to repay loans or fails to meet output targets. When financing, consideration must be given to pricing risk and industry competition risk:

1. Pricing Risk: The operational outcome directly determines the project's ability to generate expected returns and repay loans, rendering product pricing crucial.
2. Industry Competition Risk: Competition from similar projects may lead to underpriced products and customer attrition, causing project profits to fall short of expectations and hampering loan repayment.

3. Measures for Managing Key Financing Risks in International Engineering Projects

Based on risk analysis, this paper proposes risk mitigation strategies, as shown in Table 1.

Table 1: Financing risk categories and corresponding mitigation strategies in international engineering risks

Risk categories	mitigation strategies
Political Risk	signing concession agreements; obtaining investment insurance; engaging in negotiations with the host country's government
Legal Risk	Engaging domestic legal counsel as consultants; entrusting contract review to locally-based attorneys; selecting a mutually acceptable third-country arbitration body
Economic Risk	Employing foreign exchange forecasting techniques; entering into fixed-rate contracts; utilizing interest rate swaps (IRS); implementing interest rate futures hedging; trading interest rate options; incorporating inflation-indexed clauses in contracts; adopting low-interest-rate currencies

DOI: 10.54254/2754-1169/116/20242476

Table 1: (continued).

Market Risk	adjusting project profit margins according to the prevailing commercial environment
Contractual Risk	conducting assessments of counterparties' creditworthiness; securing financial commitment and support letters
Construction Risk	establishing fixed timelines; incentive clauses; participation in insurance
Operational Risk	developing market-responsive pricing schemes;implementing distinctive designs

3.1. Mitigation of Political Risk

Pre-investment measures to hedge against political risks encompass the signing of concession agreements, securing investment insurance, and engaging in negotiations with the host government. Concession agreements are legally binding instruments between multinational corporations and the governments of their investment destinations, typically encompassing provisions on capital repatriation, price regulation for products sold domestically, control over raw materials, and international staffing arrangements.

Investment insurance serves as a mechanism for transferring political risks to external institutions. These policies typically cover expropriation risk, war risk, and transfer risk, with insurers compensating investors for economic losses incurred due to the materialization of such risks, as per the terms of the insurance contract.

Before investment, it is essential to engage in dialogue with the host government, culminating in a formal agreement aimed at minimizing the likelihood of political risks materializing. The content of such agreements must be unambiguous.

3.2. Legal Risk Management

Engaging legal counsel from the project's host country is advisable. Given the idiosyncrasies of each nation's legal system, construction firms often struggle to attain a comprehensive understanding of the laws across multiple jurisdictions, rendering the appointment of a local attorney indispensable. In the contract drafting phase, the input of these attorneys should be sought for review and provision of relevant advice, with the preferred version being one that adheres to internationally accepted standards.

Dispute resolution should be entrusted to an impartial arbitral institution located in a third country, as disputes adjudicated in the project's locale may disadvantage contractors due to the host country's resources, even when they have a strong legal case.

3.3. Economic Risk Mitigation

1. Control of Exchange Rate Risks:

It is imperative to accurately identify the foreign exchange exposure faced by project sponsors and employ scientifically sound forecasting techniques alongside effective risk management tools to mitigate exchange rate-related losses.

2. Management of Interest Rate Risks:

Following successful negotiations with lending banks for loan contracts containing advantageous provisions for sharing interest rate risks, sponsors can further employ the following strategies to hedge against and control interest rate risks:

a) Fixed-Rate Contracts: A straightforward approach to mitigating interest rate risk involves entering into a fixed-rate loan agreement, thereby locking in interest costs. However, this strategy precludes the potential cost savings derived from declining interest rates.

DOI: 10.54254/2754-1169/116/20242476

b) Interest Rate Swaps (IRS): An IRS involves two parties agreeing to exchange interest payments based on a notional principal amount for a specified period, to reducing financing costs. The most common form of IRS involves the swapping of fixed and floating interest rates.

c) Interest Rate Futures Hedging: This strategy involves sponsors holding restricted amounts of loan assets engaging in offsetting interest rate futures contracts in the derivatives market, taking opposite positions to their spot market exposures. By exploiting the countervailing movements in interest rates between the two markets, this approach aims to neutralize interest rate risk.

d) Interest Rate Options Trading: Sponsors can purchase interest rate options, paying a premium for the right to buy or sell a predetermined quantity of interest-bearing instruments at a specific rate upon option expiration. These options offer protection when interest rates move unfavorably and enable gains when rates move favorably. Common forms include caps, floors, and collars.

3. Containment of Inflationary Risks:

Project pricing adjustments should adhere to a principle that balances the interests of all stakeholders, ensuring both the cost-effective provision of goods/services and adequate incentives—through reasonable returns and risk control—to enhance project performance. This principle underpins the inclusion of inflation-adjustment clauses in relevant contracts, such as those incorporating price index hedging provisions and foreign exchange and price index hedging control mechanisms.

4. Selection of Loan Currency:

In terms of financing costs, loan currencies exhibit varying interest rates at different stages. During the fundraising process, it is advisable to opt for low-interest-rate currencies within the available choices, as this significantly reduces overall financing expenses. Additionally, aligning the loan currency with the currency of cash flows helps minimize foreign exchange losses.

3.4. Addressing Market Risk

Before entering a given country, a thorough assessment of its engineering market, particularly the business environment and demand dynamics, is necessary. Should unfavorable changes in the business environment or shrinking demand occur, prompt adjustment of project implementation plans and profit margins is warranted. Throughout the financing process, continuous monitoring of political, economic, and industry-specific information, complemented by expert consultations, enables informed projections about market conditions.

3.5. Countermeasures for Contractual Risk

1. Control of Owner Creditworthiness Risk:

Sponsors should prioritize assessing the financial standing and credit history of owners and conducting objective evaluations before committing to financing, thus avoiding hasty decisions. Supplementary assurance can be obtained through site visits, financial commitment letters, and support letters from project participants.

2. Management of Contractor Performance Risk:

Emphasis should be placed on evaluating contractors' past project performance, ensuring they possess sufficient construction capabilities and extensive experience, while also investigating any negative credit records. Moreover, scrutiny of contractors' financial status is crucial to confirm their financing capacity, with some circumstances requiring contractors to demonstrate a degree of self-financing capability.

3.6. Coping with Construction Risk

1. Completion Risk Control:

DOI: 10.54254/2754-1169/116/20242476

Adherence to turnkey construction contracts forms the foundation for managing completion risks, as these typically specify fixed timelines, prices, and incentivized clauses for early completion. Contractors are held liable for delays or failure to meet technical specifications, while bonuses are awarded for timely completion. Thorough due diligence on contractors' reputation, project experience, and technical expertise ensures their suitability for the project.

2. Overrun Cost Control:

Any risk factor during project execution can potentially lead to increased construction costs. Thus, it is recommended that overseas Chinese investors prioritize participation in overseas insurance markets to diversify risks and manage costs. Additionally, shareholder support agreements can allocate responsibility for funding cost overruns proportionally among shareholders, with provisions stipulating that within a certain threshold (e.g., 10%), shareholders contribute additional funds based on their equity stakes, while exceeding this threshold triggers joint financing by both shareholders and lending banks.

3.7. Managing Operational Risk

1. Control of Pricing Risk:

During the project preparation stage, comprehensive market research and analysis should be conducted to establish a rational pricing scheme. Throughout the operational phase, vigilant monitoring of economic trends and market fluctuations enables appropriate price adjustments, maximizing returns.

2. Competitive Risk Mitigation:

In the project's early stages, market research and industry analysis should be conducted to identify key competitors. During the project design phase, emphasis should be placed on tailoring project features to specific market demands, imbuing the project with distinct characteristics to enhance competitiveness. Furthermore, fostering positive relationships with local governments and the public, fulfilling corporate social responsibilities, and cultivating a strong corporate image can position the project favorably in market competition.

4. Conclusion

This paper systematically identifies the categories of financing risks associated with international engineering projects, which primarily encompass political risks, legal risks, economic risks, market risks, contractual risks, construction risks, and operational risks. Building upon an analysis of the underlying mechanisms and manifestations of these risks, the study further proposes a set of risk management measures. To mitigate risks, it advocates for the adoption of strategies such as entering into concession agreements, securing investment insurance, and engaging in negotiations with host governments in response to political risks; engaging domestic legal counsel as consultants for managing legal risks; employing effective foreign exchange risk management tools, executing fixed-rate contracts, and utilizing interest rate swaps (IRS) in the context of economic risks; adjusting project profit margins according to the prevailing commercial environment in addressing market risks; conducting assessments of counterparties' creditworthiness and securing various financial commitment and support letters in dealing with contractual risks; establishing fixed timelines, incentive clauses, and participation in overseas insurance for controlling construction risks; and developing market-responsive pricing schemes and implementing distinctive designs to manage operational risks. These recommendations serve to comprehensively identify and proactively devise suitable risk mitigation strategies for "going global" engineering endeavors, thereby reducing the likelihood of risk events and facilitating the smooth progression of international engineering projects.

DOI: 10.54254/2754-1169/116/20242476

However, the study is not without limitations. Notably, it does not delve deeper into the quantification of risks, leaving room for future research in this area. Moreover, the paper largely focuses on theoretical exploration, lacking empirical, quantitative studies that could further substantiate its findings and enhance the practical applicability of its proposed risk management strategies.

References

[1] *Hu, W. & Sun, H. K. (2016). Analysis of the Risks and Prevention Strategies for Chinese Enterprises' Outward Direct Investment under the Belt and Road Initiative Perspective. Journal of Hubei University of Economics (Humanities and Social Sciences Edition), (03), 56-58.*

[2] *Qu, L. L., & Han, X. (2016). Identification of Financial Risks and Regulatory Research in the Construction of the Belt and Road. Learning and Exploration, (08), 132-136.*

[3] *Wang, F. Y. (2016). Prospects and Risk Prevention of China's Overseas Investment under the Belt and Road Strategy. Economic Review, (07), 33-36.*

[4] *Huang, W. Y., Fan, Z., & Zhang, Y. F. (2007). Exchange Rate Risk Management in Project Financing. International Economic Cooperation, (09), 66-69.*

[5] *Cheng, S. T. (2008). Financial Risk Management in Project Financing — Based on the Project Initiator Abroad. Special Economic Zone Economy, (02), 297-298.*

[6] *Sauer C. & Alok K. Bohara. (2001).Exchange Rate Volatility and Exports: Regional Differences between Developing and Industrialized Countries.Review of International Economics(1),133-152.*

[7] *Mahamid I.(2014).Contractors' perception of risk factors affecting cost overrun in building projects in Palestine.The IES Journal Part A: Civil Structural Engineering(1),38-50.*

[8] *Guo Y. and Ma S. Research on Exchange Rate Risk and Countermeasures of International Engineering Contract Project [J]. Engineering Economy, 2015, 9:104-109.*

[9] *Seung H., Hyung H., Keun P., Sang Min Yeom, Myung Jin Chae & Du Yon Kim. (2014).Risk-Integrated Cash Flow Forecasting for Overseas Construction Projects.KSCE journal of civil engineering(4),875-886.*

[10] *Chang F, Hsin C, Shiah-Hou S.(2013).A re-examination of exposure to exchange rate risk: The impact of earnings management and currency derivative usage.Journal of Banking and Finance(8),3243-3257.*

[11] *Niu, W.Y. (2020). "Risk Evaluation and Prevention of International Engineering Project Financing under the Belt and Road Initiative." MA thesis, Chongqing University.*

[12] *Cai, W.C. (2020). "Research on Risk Management of International Engineering Project Financing." MA thesis, Southeast University.*

[13] *Sun, Y.W., & Zhu, M.l. (2022). "Recommendations for Risk Avoidance in International Engineering Financing under the Background of Debt Crisis." International Engineering and Labor (06), 29-31.*