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The "Belt and Road Initiative" Cooperation Logic of Medium-Sized Powers with Complete System: An Analysis of the Governance Mechanism Based on the Chilean Railway Modernization Project

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Abstract. The improvement of the governance system is an important adaptation factor for medium-sized powers to join the "Belt and Road Initiative" cooperation. The sound governance system, rule system and implementation capacity are highly consistent with the basic concept of win-win cooperation advocated by "Belt and Road Initiative". It will help to reduce institutional costs and various risks and challenges in international cooperation, and improve the efficiency of cooperation. Chile is a typical representative of a medium-sized power with a relatively perfect governance system in Latin America. Chile is an important partner for China to carry out "Belt and Road Initiative" Latin American infrastructure construction cooperation with stable political situation, complete legal system and clear strategic planning. its railway modernization is the main platform for "facility connectivity" between China and Chile. It centrally reflects the special logic and wisdom of the medium-sized powers participating in the cooperation of "Belt and Road Initiative" with complete system. The author takes the largest single contract of Chilean National Railway Company as the case study object, taking the governance mechanism as the starting point, on the basis of medium power theory and embedded autonomy theory, this paper discusses the governance of the project from three aspects: system docking, interest coordination and risk prevention and control. And contact the literature and cases of friendly relations between the two countries, transnational knowledge transfer, medium-power governance, unification of railway standards, bilateral trade, digital Silk Road, industrial linkage development, foreign investment strategy, foreign governance and so on. This paper reveals the inherent law of Belt and Road Initiative cooperation among medium-sized powers with complete system based on multi-dimensional governance system, and summarizes the replicable experience and enlightenment, so as to provide theoretical reference and practical plan for deepening multi-field cooperation between China and similar countries.

Keywords: Medium power with complete system, belt and road initiative, cooperation logic, chilean railway modernization, governance mechanism, system docking, win-win interests

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1. Introduction

Since the Belt and Road Initiative was proposed in 2013, China has closely cooperated with many countries and international organizations around the world. The scope of cooperation has expanded from infrastructure to trade and economy, digital technology, and renewable energy, entering a new stage of development. During this process, the institutional attributes of its partners have become increasingly important for the outcome of cooperation. Middle-sized countries with sound institutions have leveraged their advantages to participate in high-quality Belt and Road cooperation. These countries, located between major powers and small countries, possess both independent development capabilities and regional influence, free from the strategic burdens of major power competition. They are more inclined to achieve their development goals through mutually beneficial cooperation. Their mature governance systems provide stable rule guarantees for cross-border cooperation and help resolve common problems such as rule conflicts and difficulties in contract fulfillment.

Mutual trust and coordination among countries are the underlying support for cross-border cooperation. The model of ironclad friendship between China and Serbia demonstrates the importance of institutional trust and strategic alignment in laying a solid foundation for cooperation under the principle of mutual benefit and win-win [1]. This logic of cooperation that transcends geographical limitations provides an important reference for China's cooperation with Chile and other middle powers with sound institutions, and also lays a conceptual foundation for the advancement of the modernization project of the China-Chile railway. Chile, as a benchmark of middle powers with sound institutions in Latin America, has long ranked among the top in the region in terms of government efficiency and the rule of law. Its foreign cooperation practices fully align with the characteristics of middle powers. Based on an analysis of middle-sized countries in Latin America, Chen Yuanting proposed the action strategies and challenges faced by middle-sized countries in the global governance system and argued that improving institutional construction is an important condition for middle-sized countries to improve their international cooperation situation and enhance the level of international cooperation. This has significant implications for understanding Chile's behavior within the framework of the Belt and Road Initiative [2].

In 2018, China and Chile signed a memorandum of understanding on jointly building the Belt and Road, making Chile one of the earlier countries in Latin America to respond to the initiative. Their cooperation has expanded from traditional agricultural and mineral trade to high-end fields. In April 2025, a Chinese enterprise successfully won the largest single contract of the Chilean National Railway Company [3]. This marked the entry of the China-Chile railway modernization project into a substantive implementation stage. The project covers multiple aspects such as mainline upgrades, technological renovations, and operation and maintenance management, involving core issues such as institutional alignment and interest balance. It serves as a typical sample for analyzing the cooperation logic of middle powers with sound institutions within the Belt and Road framework. Currently, academic research on China-Chile cooperation mainly focuses on specific aspects and has not explored the governance approach of the China-Chile project as a whole. Moreover, the combination of digital technology and traditional infrastructure construction, as well as how to achieve institutional compatibility and benefit sharing, are areas that need further research. Therefore, this article attempts to answer the following three questions: First, what are the basic principles for middle-sized countries with relatively complete but not fully mature institutions to participate in Belt and Road infrastructure projects? Second, what governance mechanisms are used in the China-Chile high-speed railway modernization project to achieve institutional adaptation and risk mitigation? Third, what lessons can the China-Chile high-speed railway modernization project

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offer for China's cooperation with similar countries, in order to provide rich case materials for related theoretical research and practical references?

2. Theoretical foundation and analytical framework

2.1. Middle power theory and the connotation of institutional completeness

The middle power theory has been well-developed over several decades, and domestic scholars' research on its application in China has become increasingly relevant to China's reality. Chen Yuanting expounded on the main challenges and coping strategies of middle-sized Latin American countries in the international order and defined a well-institutionalized middle power as one that possesses a sound legal system, efficient administration, social stability, and a clear national strategy, capable of accurately responding to the demands of external cooperation and reducing risks in international cooperation [2].

International infrastructure construction involves both technical and institutional aspects. Wang Jiao'e, Du Fangye, and Liu Weidong used the example of the Mombasa-Nairobi Railway to examine how institutions and culture influence embedded foreign technology transfer, and they pointed out that foreign technology transfer should take into account local institutional factors and meet actual needs. This view is also applicable to the foreign technology transfer and technology adaptation process of the China-Chile Railway Modernization Project discussed in this paper, highlighting the importance of institutional synergy in the technology transfer process [4].

The completeness of Chile's institutions is also reflected in its railway system. Yang Tingzhi, Li Wenxia, and Zhang Xi analyzed the development of national railway standardization in Chile and found that Chile's national railways have relatively complete standardized norms in terms of construction, operation and maintenance, and safety management, and these norms are basically in line with the standards of major countries in the world. On this basis, cooperation and technology implementation in the modern railway project between China and Chile have more guidelines to follow, which is a specific manifestation of institutional completeness in a certain industrial field [5].

2.2. The theory of governance mechanisms and the theory of embedded autonomy are compatible

Governance capacity refers to the effective operation of governance mechanisms that play a significant role in the process of international cooperation, and it encompasses three aspects: institutional connection, interest distribution, and risk response. The level of governance capacity will directly affect the progress and development outcome of international cooperation. From the perspective of embedded autonomy, governments of countries with complete institutions have strong autonomy and embeddedness characteristics. In the process of conducting international cooperation, they can fully consider their own interests and demands, and also deeply engage in the market and society, coordinating the interests of all parties.

The advancement of the modernization project of the China-Chile railway requires a stable development of bilateral trade as its foundation. Zhong Xiaoli sorted out the brief situation of China-Chile bilateral trade in the first seven months of 2025. The data confirmed the active trend and complementarity of China-Chile trade. Stable bilateral trade provides a favorable economic and trade environment for the railway project and also gives the cooperation stronger endogenous impetus, becoming an important practical support for the smooth progress of the project [6]. In addition, with the support of new technologies, the cooperation model is constantly changing. Xie

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Jianing believes that the Digital Silk Road is building an innovation network in Latin America, which has transformed the modern tram project between China and Chile from traditional infrastructure construction to intelligent and information-based construction. During the construction of the tram project, a digital collaboration model was integrated, achieving the organic integration of infrastructure construction and the digital industry [7].

2.3. Construction of the analytical framework

In view of the above theoretical and practical basis, this paper adopts the analytical framework of "institutional basis-governance mechanism-cooperation effectiveness-empirical enlightenment": the institutional basis is based on the soundness of the Chilean system, the basic guarantee is constructed through the construction of Chilean railway standards and the national characteristics of medium-sized powers [2,5]. The governance mechanism starts with institutional convergence, benefit distribution and risk prevention, supplemented by the transformation path of scientific and technological achievements and the digital Silk Road to supplement the mechanism [3,7]; the effect of cooperation includes economic, institutional and social benefits, involving bilateral trade, industrial coordination and other practical effects [6]; draw lessons from and summarize the cooperation experience that can be promoted, and finally form a complete framework, which is easy to sort out ideas and research.

3. Governance mechanism practice of China-Chile railway modernization project

3.1. Governance mechanism practice of China-Chile railway modernization project

Institutional docking is the premise of cross-border infrastructure cooperation. China and Chile build a two-way adaptive institutional docking mechanism based on "international standards and local demand" to solve the problem of rule differences. At the legal level, Chile's sound laws on foreign investment and engineering construction delineate compliance boundaries for projects, Chinese enterprises strictly follow local laws to promote projects, and the Economic and Trade Office of the Chinese Embassy in Chile plays a bridging role, building a platform for intergovernmental system coordination, resolve policy differences in a timely manner, and ensure project compliance [3].

In terms of specific technology, the Chilean railway standardization system listed by Yang Tingzhi and others is a direct reference for bilateral cooperation. Chinese enterprises export mature Chinese railway technology at the same time, adjust the construction scheme according to Chilean geological conditions and transport demand, "Chinese technology + Chilean standard", to realize the organic combination between the two [5]. The embedded logic in the process of technology transfer put forward by Wang Jiaoe and others has been well practiced here. The output of Chinese enterprises is not only technology, but also closer to the local system and culture, so as to avoid the phenomenon that technology is divorced from the local reality. Make the technology transfer really effective.

Second, in terms of digital docking, according to the construction plan of the Digital Silk Road in Latin America, the two countries have applied digital means to railway operation and maintenance standards to realize the intelligent development of the project. it meets the needs of Chile and the requirements of the construction of the digital silk road, and realizes the full coverage from traditional rule docking to digital rule docking [7].

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3.2. Interest coordination mechanism: the balance of multiple subjects

The China-Chile railway modernization project involves a variety of stakeholders, such as the governments, enterprises and local communities of the two countries, and their interest demands are not exactly the same. How to establish a good interest coordination mechanism is very important. Chile will implement railway modernization into the national development plan to improve logistics efficiency and support industrial development; China also regards the project as part of the "Belt and Road Initiative". The matching of technology and standards and the strategic demands of both sides is the basis of interest coordination.

At the enterprise level, Chinese enterprises and Chilean national railway companies establish a revenue-sharing model, while linking local enterprises to participate in project construction. Chen Zhengqi's research on the development strategy of Chilean iron and steel companies provides a reference for the cooperation between Chinese enterprises and local iron and steel enterprises. Chinese enterprises give priority to purchasing local steel products in Chile, which not only reduces project logistics costs, but also helps the development of the local iron and steel industry, and realizes the win-win situation of the industrial chain [8]. This cooperation model is also consistent with Chen Taotao's research conclusion on the relationship between government and foreign capital in the process of Chilean industrialization-Chile coordinates the interests of foreign capital and local industry through the mode of "government guidance + market operation". The cooperation practice of Chinese enterprises is the vivid embodiment of this model, which not only ensures the commercial income of enterprises, but also promotes the upgrading of local industry [9].

As far as society is concerned, actively use the local labor force and train its relevant skills to ensure that the interests of the surrounding residents are protected; and carry out construction in accordance with local environmental protection standards, so that economic and social benefits develop together, and finally achieve a win-win situation.

3.3. Risk prevention and control mechanism: the combination of marketization and institutionalization

There are risks in policy, market and operation in international engineering cooperation. China and Chile give full play to Chile's institutional advantages, "institutionalized prevention and control + market-oriented decentralization" to ensure the sustainability of the project. From the perspective of policy risk prevention and control, Chile's relatively stable political situation and clear foreign investment policy have reduced the risk of policy changes [2,9], and the signing of long-term cooperation agreements between the two sides have solidified their respective rights and obligations. the third is to provide institutionalized protection.

The third is to control market risk. Based on the steady development of bilateral trade between China and Chile, it provides favorable economic background conditions for the smooth development of the project and reduces the risk brought by market uncertainty to the project [6]. In addition, in the process of railway investment in Chile, Chinese enterprises learn from Zhang Meng's experience in the investment analysis of Chile's power industry and adopt a variety of ways to attract foreign investment in order to reduce the risks brought by a single investment. Avoid taking on too much pressure unilaterally, this model can not only adapt to the Chilean market environment, but also reduce capital risk [10].

In terms of operational risk prevention and control, the two sides rely on the Chilean railway standardized operation and maintenance system to establish a joint operation and maintenance mechanism, combining the experience of Chinese railway operation and maintenance and Chile's

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local management model to improve operational stability [5]; at the same time, integrate digital technology into operation and maintenance links, reduce operational risks through intelligent monitoring, and form a whole process risk management and control system [7].

4. The "Belt and Road Initiative" cooperation logic of medium and powerful countries with complete system

4.1. The logic of system adaptation: reducing the cost of cooperation by rule docking

One of the core logic for medium-sized powers to participate in "Belt and Road Initiative" cooperation is to rely on their own sound institutional system, to achieve accurate docking of rules with China, and to reduce the institutional cost of cooperation from the root. The practice of iron-bar friendship between China and Cyprus is essentially the result of institutional mutual trust and rule adaptation, and this logic has been continued in the cooperation between China and Chile [1]. Chile's sound rule of law system and railway standardization system are compatible with China's infrastructure technical standards and foreign cooperation norms. Wang Jiaoe and others have put forward the conclusion that technology transfer should be adapted to the local system. It is fully confirmed here that Chinese enterprises are not simply exporting technology, but combine the Chilean system and standard adjustment scheme to make the technology land more smoothly [3,5]. Chen Yuanting pointed out that the core dilemma of medium-sized countries participating in global governance is the problem of institutional adaptation, and Chile relying on institutional integrity to solve this dilemma has become the key to the smooth progress of cooperation [2].

4.2. Benefit win-win logic: from one-way output to two-way empowerment

Different from the traditional unilateral export of technology or capital from one country to another, the logic of cooperation between medium-sized powers and China under the background of "Belt and Road Initiative" is a win-win mode of two-way empowerment. The complementary trade relationship between China and Chile constitutes the basic conditions for cooperation. Railway construction can not only serve the modernization and upgrading needs of Chile's domestic railway system, but also provide platform support for Chinese technology and standards to go abroad [6]. Chinese enterprises join local steel enterprises and local capital in project construction to promote local development, echoing the logic put forward by Chen Taotao and others that the government and foreign capital work together to promote development [8,9]. At the same time, the digital Silk Road blessings make cooperation not only limited to infrastructure but also to the digital field, promote each other in industry and technology, and truly achieve a win-win situation [7].

4.3. The synergetic logic of governance: multiple mechanisms to ensure the effectiveness of cooperation

Cooperation continues to rely on the key logic of governance synergy, and medium-strong countries with complete systems rely on good governance capabilities to establish a pluralistic and collaborative governance mechanism with China. The triple mechanisms of system docking, interest coordination and risk prevention and control of China-Chile railway projects support each other and form a closed loop. Chilean railway standardization system provides rule support for the governance mechanism. Chinese enterprises draw lessons from the investment strategy of the electric power industry to improve risk prevention and control [5,10]. Bilateral trade provides economic guarantee for the operation of the governance mechanism, digital technology improves the quality and

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efficiency of the governance mechanism, works together with multiple factors, and maximizes the effectiveness of cooperation [6,7]. This kind of governance synergy logic not only accords with the governance characteristics of medium-sized powers, but also can solve the governance problems of transnational cooperation [2].

5. Conclusion

Based on the study of the cooperative logic of "Belt and Road Initiative" in the medium-sized power with complete system and the specific investigation of the China-Chile railway modernization project discussed in this paper, the following conclusions are worth putting forward: first, for the medium-sized power with complete system, the "Belt and Road Initiative" initiative has a high degree of agreement. A complete system can provide a relatively safe and stable environment for them to participate in "Belt and Road Initiative". Second, the smooth progress of the China-Chile railway modernization project benefits from the governance models such as mutual recognition of systems, balance of interests, risk aversion and so on. Rule adaptation, win-win interests and risk resolution have been achieved, and the operation of each mechanism has a corresponding theoretical and practical basis; the logic of cooperation among countries with complete systems is the three dimensions of institutional adaptation, win-win interests and coordination of governance, which are interrelated and form a complete closed loop of cooperation, which not only accords with the concept of mutual benefit and win-win results of "Belt and Road Initiative", but also highlights the advantages of cooperation among medium-sized powers.

First of all, consolidate the foundation of trust, learn from the experience of iron-bar friendship between China and Cyprus, take win-win cooperation as the guidance, strengthen the institutional trust with medium-strong countries with complete systems, and lay a solid foundation for cooperation. Secondly, adhere to the system first, first integrate with the partners with complete system, fully learn from the technology transfer experience of Wang Jiaoe, etc., deeply integrate technology with domestic systems and standards, and reduce costs. Third, pay attention to two-wheel drive, make use of the complementarity of bilateral trade, combine localized industries and funds, and implement Chen Taotao's idea of the integration of domestic and foreign investment to achieve a win-win situation. Fourth, attach importance to digital empowerment, combine infrastructure construction with digital economy on the basis of promoting the Digital Silk Road, and increase the value of cooperation. Fifth, pay attention to risk control, refer to the investment model of Chile's power industry, adopt diversified investment methods, rely on standardized operation and management of railways, and form a risk control mechanism in the whole life cycle.

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