

# Strategic Analysis of Investment and Financing System of Gwadar Infrastructure System

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**Abstract**—The development of a port is based on infrastructure in order to give full play to its superior geographical location. Gwadar Port, which has been taken over by China for 43 years, is located near strategic throat of Persian Gulf and is the node port and flagship project of "The Belt and Road" and China- Pakistan Economic Corridor(CPEC). However, similar to Shenzhen 40 years ago , which has a small scale and poor infrastructure, it is very important to improve the infrastructure as soon as possible during the operation period. Based on the literature review, basic theoretical analysis and current situation analysis of Gwadar Port, this paper draws lessons from the system of investment and financing of infrastructure in Shenzhen Port and some developed countries, and brings forward some suggestions for perfecting that of Gwadar Port .

**Index Terms**—Asymmetric information, Block chain, Credit risk, Online Supply Chain finance

## I. INTRODUCTION

### A. Topics Background and Significance

The economic and trade cooperation between China and Pakistan is taking CPEC as the lead and paying attention to Gwadar Port, energy, transportation infrastructure and industrial cooperation, and then forming a "1 + 4" economic cooperation layout. It is estimated that 46 billion U.S. dollars will be invested in CPEC. It plans to complete the construction of various infrastructures by 2030.

Gwadar Port has been taken over by China .It not only locates in the strategically important Gulf of the Persian, but also important to " The Belt and Road" (B & R) and the CPEC. The construction of Gwadar Port is an important part of CPEC. To complete the goal of building of CPEC over the next 10 years, going into the current system of investment and financing for the Gwadar infrastructure, which boosts the infrastructure construction in Gwadar Port ,is very important.

### B. Gwadar Infrastructure Overview

Gwadar Port is one of the two major military ports in Pakistan. It is on the west coast, close to the Iranian side of the Middle East power and is Pakistan's most remote port. Located in the impoverished and backward Baluchistan province, it was originally a humble little fishing village that has drawn attention because of its superior geographical location and has now become the end of the CPEC. However, the climate here is hot and dry with few vegetation, more sandstorms, far away from the economic hinterland, poor

infrastructure facilities and a lower standard of living.

After the completion of Gwadar Port ,importing loading and unloading goods are mostly designated by the government . Nowadays Gwadar port has opened container lanes to the Middle East and China, mainly transporting fishery products and building materials. The status quo in Gwadar is demonstrated to lack of adequate facilities for the transfer of dredging, hence,the driving force of the economic hinterland is limited. The first phase of Gwadar Port was completed in 2005, and three 20,000-ton multi-purpose berths (50,000-ton structure and 602-meter coastline) have been built. The designed capacity is 100,000 TEU / year of container, 270,000 tons of groceries / 450,000 tons of bulk grain per year. However, due to the problems such as the collection and distribution and the weak supporting facilities, the operation of Gwadar Port Phase I Project over the years is not ideal. Although it was operated by the Port Authority of Singapore for about 6 years in 2007, most of the time, Gwadar Port basically remained idle and was not effectively developed.

Gwadar is sparsely- populated, not much construction, a lack of communication facilities, even in the Gwadar luxury hotel - Pearl Intercontinental Hotel has only one office room. In addition, there is serious power crisis, it often blackouts in summer. Gwadar airport is also quite primitive, there is no flat and modern runway. As for the highways, only one road connects with the hinterland and the external links are not smooth. There are only two-way two-lane low-grade highways, no fast lanes and no railways connected with Central Asia.

Therefore, it is very important to perfect the port infrastructure, such as strengthening or newly constructing the harbor terminal embankment, paying attention to the construction of railway and highway in the port area, taking the necessary environmental protection measures, facilitating modern communications, water supply and drainage system and energy supply. All in all, there is an urgent need to improve the infrastructure in Gwadar and there is still a long way to go.

## II. LITERATURE REVIEW

### A. Port Investment and Financing Theory

Investment and financing system includes the main investment behavior, financing methods, investment patterns, project decision-making procedures, construction management and macro-control aspects of the content.

There are two main types of port financing and investment: government and private investors.

Fund of port investment and financing mainly comes from

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the central and local government investment, independent investment in port enterprises, financial institutions, financing, project financing. Among them, project financing is a novel financing method, including financial leasing, BOT, TOT, private construction - government, leasing - private management (PPP)

Financial leasing means that considering the specific requirements and the choice of the lessee, the lessor pays to the supplier to purchase leasing items, and leased these goods to the lessee to use, the lessee will pay the lessor rent in installments, the ownership of the leased object belongs to the lessor during the lease term, while the lessee just has the right to use it. After the expiration of the lease term, payment of the rent is completed and the obligations of the lessee are achieved using the provisions of the finance lease contract. If there is no agreement on the vesting of the lease item or the agreement is unclear, the both party can be negotiated; if the supplementary agreement can not be reached, the lease contract shall be terminated in accordance with relevant provisions of the contract or trading habits to determine, still not for sure, then the ownership of the lease items is owned by the lessor.

BOT refers that the government transfers some of the proposed infrastructure construction projects to a consortium or company by attracting investment, organizes the project management company for construction and operation. Within a certain period of time agreed by both parties, the project management company relies on the operation to repay debt, withdrawal of investment and profitability. When the project expires, property ownership belongs to the government.

TOT method is a relatively popular international project financing method, usually refers that government departments or state-owned enterprises transfer a certain period of property rights or management right of a good built project to investors which are in charge of its operation and management; investors operate to recover the entire investment and get a reasonable return within a prescribed period, after the expiration of the contract, investors return the project to the government sector or the original business of a financing.

PPP is a public infrastructure project mode of operation which combines the government with social capital. Under this model, private enterprises and private capital are encouraged to cooperate with the government and participate in the construction of public infrastructure. Narrow PPP can be understood as a series of project financing generic term, including BOT, TOT, DBFO and other models.

Port investment and financing is one of the important factors to promote economic growth. It is also an important step in the effective implementation of the strategy of "strengthening port to toughen up city" and also an important measure for developing the port logistics industry.

### *B. Study On the Infrastructure of Gwadar*

Gwadar construction needs supporting facilities. Haque & Kim (2003) analyzed panel data from 1970 to 1987 in 15 developing countries and found that infrastructure investments such as transportation and communications have a significant positive impact on economic growth. Xiangyu Zeng (2009) believed that one of the most important

constraints on the long-term economic development in Balochistan was that the local infrastructure was extremely backward and the basic conditions of transportation, electricity, telecommunications and even drinking water are not fully guaranteed. Kaiming Yu (2013) pointed out that Balochistan was an underdeveloped part of Pakistan and Balochistan has generally been sluggish due to lack of funds and poor security conditions, even 19 projects supporting road construction around Gwadar Port was not completed as scheduled. Wei Qiaofang et al (2014) pointed out that Pakistan's domestic infrastructure was backward. Gwadar Harbor was not yet connected to the Central Asian railways. At present, only one road connected with the interior. Qingyan Li (2015) showed in his research that the construction plan of the "China-Pakistan Economic Corridor" not only perfected infrastructure construction but also solved the problem of energy shortage in Pakistan, like electricity and infrastructure built that was closely linked with people's life, such as water resources, sewage and garbage disposal. Pakistan's infrastructure was old and backward, especially power plants, highways, railways and other urgent upgrades. Chenyu Cai (2017) hold that the infrastructure in Gwadar Port was weak and that there were serious problems in power, network and airport facilities. The linkage with developed air airports in other major port cities in the world was a long-term and grand project for Gwadar Port. The construction of the artery of China-Pakistan railway terminating at Gwadar Port was also a grand project in the long run. In order to make a long-term contribution to the cooperation between China and Pakistan in developing Gwadar, it is necessary to do a good job in supporting infrastructure construction and implementing the strategy of long-term peace and sustainable development.

### *C. research about port infrastructure investment and financing*

Theory of infrastructure investment and financing system. E. S. Savas (2002) argued that the private sector could invest funds in infrastructure through contracts, franchises, subsidies and vouchers. Jiuhi Li and Yanli Yu (2003) pointed out the main ways for financial investment in port: (1) Government investment (2) Establishment of special funds (3) Financing of financial institutions (4) Issuance of bonds (5) Issuance of shares (6) Project financing (7) Financial leasing. Guanqun Mei (2012) also pointed out that the world's port construction and financing methods were diverse. Specifically, the main modes of investment and financing in various ports in the world were invested by central and local governments, independent investment by port enterprises, financed by financial institutions and project financing. According to Jin Yu and Wei Zhang (2006), in terms of economics, the contents of the investment and financing system mainly included: how to determine the main body of investment and financing, how to choose the mode of investment and financing, and how to deal with the economic relations among various economic entities in the investment field. According to their management organization, they could be divided into the main structure of investment and financing structure, investment and financing allocation mechanism and investment management system, the core

content was to solve who invests, how to invest and financing and how to coordinate the relationship between the handling. Rui Kang and Yang Liu(2008) believed that the smooth progress of investment and financing in the port would help increase the port throughput and enhance the port production and reproduction capacity, thus realizing the multiple countries' economic benefits of logistics export, infrastructure construction and employment, the construction and improvement of the relevant system ,which had a significant meaning for the further development of the port industry under the open conditions of China.

About Shenzhen Port and Some Developed Countries in Port Infrastructure Investment and Financing. Nian Liu(2003) thought the diversified forms of investment and financing in port enterprises included government investment, bank loans, foreign capital entry, market financing, the transfer of the right to operate ports, and the leasing of terminal facilities. Shenzhen Port had diversified its investment in ports and had various funding channels including government, private enterprises, capital markets, domestic and foreign markets. Cuihong Peng(2004) pointed out that foreign port infrastructure, operating facilities investment, financing systems and policies could be summarized and abstracted out two basic characteristics: All ports, whether land-based port or non-landlord-type port, the infrastructure construction and maintenance is taken by the government; port planning and port infrastructure construction, maintenance and management functions should be united. Gang Zhao et al (2008) hold that Shenzhen was becoming an international strong port with liner routes accessible to all major ports at home and abroad. As a world-renowned container port, infrastructure construction tended to be perfect. Port logistics had become a pillar industry in Shenzhen.. The superior geographical conditions were suitable to build a fine big port, the rapid development of the economy promoted the rapid development of the port.

On improving the port infrastructure investment and financing system. Walt Rostov (2001) argued that the government played a leading role in infrastructure construction. "Infrastructure is a condition of social change, productivity development and economic growth," so government investment in infrastructure projects not only implemented economic strategies but also achieved social equity. jin Yu and wei Zhang(2006) considered establishing and perfecting the system of investment and financing in the port infrastructure system as follows: changing the state's concept of investment in the port; clarifying the status and role of the government in the system of port investment and financing; and establishing the investment structure of the port's investment and financing system ; establishing and improving the port investment and allocation mechanism; improving the investment decision-making mechanism and risk control mechanism. Xiuyun Wang(2010) pointed out that the foreign investment and financing infrastructure reform practices included the following four aspects: Firstly, introducing of competition, improving the property rights system; Secondly, guiding private capital to participate in infrastructure; Thirdly, perfecting laws and regulations ; Lastly, setting up independent regulatory agencies. Hao liang Zhang

(2016) put forward some key points for the UK infrastructure investment and financing system: 1).introducing market-oriented reforms of competition mechanisms ; 2). Emphasizing the flexibility of cooperation between government and social capital; 3). Strengthening supervision over infrastructure investment and financing; 4. Optimizing of infrastructure project management processes.

The previous essays basically introduced the basic situation of Gwadar Harbor, emphasized the benefits of Gwadar port development to China, and the weak infrastructure for Gwadar Port ,But did not specify how Gwadar Port should be developed to change from weakness to strength.. By analyzing the investment and financing methods of the infrastructure of Gwadar Port and referring to the port development history of Shenzhen Port and other developed countries, this paper puts forward some suggestions for constructing and improving the investment and financing system of Gwadar Port Infrastructure System.

### III. INTRODUCTION OF PORT INVESTMENT AND FINANCING SYSTEM IN SHENZHEN PORT AND SOME DEVELOPED COUNTRIES' AND THEIR INSPIRATION TO GWADAR PORT

#### A. Introduction of Shenzhen Port Investment and Financing System and Its Inspiration to Gwadar Port

Shenzhen Port was one of the earliest experimental areas after the reform and opening up. In 1992, it was formally listed by the State Council as the main hub port in China's comprehensive transport network. Over the past few decades, Shenzhen Port has become a veritable container hub port in southern China and will complement the advantages of Hong Kong ports and promote each other to jointly build an international shipping center in the Asia Pacific region. Shenzhen Port develops logistics industry and takes it as a pillar industry in Shenzhen. Focusing on container transport, the construction of container terminals, the development of multimodal container. On the other hand, sea, land and air transportation networks of ShenZhen port have been continuously improved, and the system of collecting, distributing goods has gradually been supplemented. The traffic conditions have greatly increased. From the number of international routes or the density of flights, as well as direct flights, Shenzhen Port are among the best in China.

The success of Shenzhen Port benefited from sound reform policies, port management mode, and increased investment by government and enterprises in port infrastructure to achieve the port coordination function structure. The development of its infrastructure is inseparable from a wide range of investment and financing system. The initial stage is for enterprises to build by means of introducing foreign capital and bank loans, and then to use social funds for construction. It also set a precedent for the cooperation between China and foreign investment in building a port, attracting foreign investment, boosting its enthusiasm and providing an important source for port financing. Government investment is mainly concentrated in the area of non-operating transport infrastructure, that is, with public properties, and gradually withdrawn from the general area of operational investment. For operational transport infrastructure and transport markets, we should establish the



dominant role of social funds in operating transportation infrastructure and transport projects that have a fee-based mechanism and a stable revenue through giving full play to the fundamental role of the market in allocating resources.

In fact, the Chinese government wants to build Gwadar into Shenzhen, China. There are many similarities between Shenzhen and Gwadar. They were originally a small fishing village. Shenzhen has a unique deep-water coastline. Gwadar Harbor is a deep-water ice-free port. Shenzhen has the policy support of reform and opening up. Gwadar has the Belt and Road Background under the policy support of the two countries; Shenzhen adjacent to HongKong and Macao, Gwadar Port is located in the global oil passage Hormuz Strait, the two are very advantageous geographic location. Shenzhen Port is a well-known container port in the world with large cargo throughput and large trade volume, which is exactly what Gwadar Port needs , Gwadar infrastructure investment and financing system should rely on the market economy as the main body.

### *B. Some Developed Countries' port Infrastructure Investment and Financing Mechanism and Their Inspiration to Gwadar Port*

According to the British think tank study, raising the completion rate of infrastructure can save 20-300 billion pounds. For the port, the infrastructure not only needs to develop but also grow faster and better so that its economic value can be tapped within a short period of time. Visible, the initial stage of port development to speed up the improvement of infrastructure is fundamental. In developed countries, due to their mature market economy, the port policy is relatively clear and specific. Studying and drawing on their existing experiences will help determine the investment and financing methods to be adopted at different stages of the construction of the port of Gwadar. According to the source and characteristics of port construction funds ,there can be divided into the following three countries as the main representative of the type.

The first one is about America, its port sources of funds come from the public finance expenditures, municipal bonds and port revenues of the federal and local governments .It considers that the port has both public and entrepreneurial federal.However, state and county financial management to build ports lead to high investment, to some extent, it is easy to get "welfare disease".

The second one is about UK, its port sources of funds come from amateur funds, international financial market funds, private investment priority, and government investment allotment. Ports are treated as business enterprises with special emphasis on economic benefits. However, the state and the government have no subsidies and higher port charges.

The third one is Japan,the funds are from government direct investment, financial subsidies, the bonds bought by public funds . It takes ports as one of the socio-economic facilities , port multi-function can drive economic development, but economic port is poor.

Different national development ports take into account the impact of national conditions, policies and geographical locations, and so the investment and financing systems are

different but special. Looking at the majority of the world's port management and investment and financing system, can be divided into two broad categories: landlord-based port management and direct investment in port infrastructure at all levels of government ports.

Landlord port management mode is adopted by most ports in the world. It integrates financing function and port management. It is a kind of investment and financing channel for infrastructure construction in the long run without government direct investment. Whether the landlord port or non-landlord port, port infrastructure construction and maintenance is taken by the government departments or enterprises that assume the functions of government departments. The above-mentioned reform of the infrastructure investment and financing system in developed countries has paid attention to the market-oriented mechanism and the success of market-oriented reforms has helped attract capital inflows and made better use of funds to build infrastructure.

In order to promote the development of Baluchistan through port economy, Pakistan's development should start with the improvement of infrastructures. In terms of infrastructure investment and financing system, we can refer to the model of landlords used by the United States. As the current operation of Gwadar Port .The right to take over by China does not require Gwadar local government funding, so using the mode of landlord port on the long-term development of Gwadar more suitable. Of course, the government should still support and vigorously promote the development of Gwadar Port in China. After all, the construction of Gwadar Port has a very important strategic significance to both sides.

## IV. SUGGESTIONS FOR PERFECTING INVESTMENT AND FINANCING SYSTEM OF GWADAR INFRASTRUCTURE

Judging from the development of the port infrastructure investment and financing system in Shenzhen and some developed countries, as the scope of the port's development becomes globalized and large-scale, the government generally invests in port infrastructure or preferential policies to help support port development. In the port operation project investment, attracting private private capital is the trend, investment and financing show diversity and innovation.

### *A. Duties of the Government and Enterprises Should Be Distinguished*

The government and the enterprises both play an important role in improving the infrastructure investment and financing system for Gwadar Port. The Gwadar government and the Chinese government have friendly cooperation to develop the Gwadar Port. Both parties make every effort to promote the development of Gwadar Port. However, the effort and implementation policy needs to be rational. The government should establish and improve the macroeconomic regulation and control system for investment and financing of infrastructure systems. The main responsibility in infrastructure investment and financing lies in macroeconomic regulation and control, and guides the

investment and financing of infrastructure through market mechanisms rather than the executive-led investment and financing. The government has a government management system and should not cross the border. The promotion of the spoons will only damage the construction of the Gwadar port. Although the enterprises in China have the right to operate Gwadar Port, the investment and financing methods still should be in compliance with local laws and regulations to gradually improve the port construction. The goal of the enterprise is not only to develop the profitability of the port, but also pay attention to the environmental protection measures, the polluted harbor seawater and the penetration of corporate culture. The government and enterprises should have distinct responsibilities and different responsibilities. Completely relying on the government is difficult, but just relying on enterprises is also struggling.

#### *B. To Promote the Port Infrastructure Investment and Financing Diversification*

The development of Gwadar requires a steady inflow of capital and diversification of financing channels. In addition to using its own funds, foreign capital is also an important way, it can not only reduce capital shortage but also provide Gwadar Container Terminal with advanced management concept and technology to help Gwadar port to increase cargo throughput. Bank loans are also commonly used as sources of funds for the construction of ports. Many Chinese banks issue a large amount of loans to port support. Although the revenue from the port projects is uncertain, the benefits are long-term. In addition, as well as stock financing, the development of Gwadar cannot be completed within a short period of time. The use of equity financing equals a commitment and pledge to investors, facilitating financing and promoting the development of Gwadar. In the early days of the construction of Gwadar port, poor operation of infrastructure also promoted the use of TOT financing, and transferring the right to operate infrastructure. When the contract expires and then recall the right to operate, thus contributing to the financing of the recycling.

#### *C. To Improve the Investment Decision-making and Risk Control Mechanism*

Investors are especially cautious because of the backward economy in Gwadar, the potential safety hazard caused by the ethnic and religious issues in the local area, the unfavorable investment environment and the long period of return on investment in infrastructure. It is important for financiers to show the future of Gwadar and persuade investors to invest boldly. The improvement of investment decision-making and risk control mechanism will help to build the platform for port infrastructure investment and financing, minimize the risk caused by uncontrollable factors and provide a reference standard for investment and financing, ensure the interests of investors in infrastructure construction, clarify the responsibilities of both parties and promote the cooperation between the two parties, giving Gwadar a steady stream of capital. Establishing and perfecting the investment decision-making mechanism and the risk-constraining mechanism is the key to bring economic benefits and social benefits on investment projects. Adhering to the principle of

"who invests, who makes decisions, who benefits and who takes risks", we will adhere to the rules and procedures for scientific decision-making, standardize the investment and financing practices, raise the scientific and democratic level of investment decisions and protect the legitimate rights and interests of investors.

#### V. CONCLUSION

The paper tries to mention how infrastructure of Gwadar port is. Additionally, relating Shenzhen port and some well developed ports, we can draw from their experiences. I hoped that this research could be instrumental and practical for others engaged in Gwadar Port for considering how to make use of it during operation period.

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