

Belt and Road Initiative and the Supply of International Public Goods

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Abstract: In the era of deepening multi-polarization and globalization, the supply and demand of public goods in the world show an unbalanced situation. The question of how to deal with the international supply of public goods is one that we all face. This article starts from the connotation and significance of international public goods to explain the necessity of the Belt and Road Initiative. Illustrate the investment environment of the countries along the Belt and Road with data, and explain the contribution of the initiative to the international public goods market. Most of the countries along the Belt and Road are emerging countries, which have great potential and space for development. But at the same time, there is a big gap in infrastructure construction in those countries. The Belt and Road Initiative brings talent and financial support to the countries along the route, and prioritizes the effective supply of infrastructure based on the large demand for public needs. In addition to the aid of infrastructure construction, China's investment in the Belt and Road countries has shown a rising trend year by year, and the scope of investment covers almost every industry of the national economy. The initiative has effectively alleviated the problem of insufficient supply of international public goods, and has become an important platform for international public goods connectivity. The Belt and Road Initiative establish an overall framework of mutual benefit in the process of transnational cooperation.

Keywords: Belt and Road Initiative; International public goods; International trade

1 Introduction

With the continuous development of economy and society, the trend of global integration has gradually strengthened, and the tide of economic globalization has imperceptibly affected the development direction and development path of different countries. Production, trade and capital are increasingly interconnected. However, there is also a trend of anti-globalization in the international community, and global problems such as international competition and trade barriers have become prominent, leading to difficulties in international economic governance. At the same time, the trend of multi-polarization in the world is deepening, and the multi-polarization of the global economic power structure is becoming increasingly obvious. China has risen rapidly as an emerging economic power, and its national and regional economies are booming. At the same time continues to seek new opportunities in the domestic and international markets, and has become an important force in promoting international cross-regional cooperation.

The Belt and Road Initiative gained wide attention from the international community. This is a manifestation of China's ability to participate in global economic governance. It can bring about

the universal benefits of connectivity and synergistic development for the countries along the Belt and Road. Effectively address the imbalance between the supply and demand of public goods among regional countries and promote multi-level and in-depth development of inter-state cooperation.

2 Literature Review

2.1 The concept and connotation of international public goods

The concept of public goods was first proposed by Paul Samuelson. In his paper *The Pure Theory of Public Expenditure*, the reference to public goods refers to each person's consumption of such an item does not lead to a reduction in the consumption of that item by others. Focus on emphasizing non-rivalry as an important criterion for judging public goods. Subsequently, Richard Musgrave expanded on the attributes of public goods. In *The Principles of Finance*, he proposed that private goods and public goods should be distinguished according to the non-competitive and non-exclusive nature of consumption. This point of view has laid a theoretical foundation for the later research on public goods. James Buchanan further broadened the meaning of public goods. In the *Demand and Supply of Public Goods*, he gives his definition of private goods and public goods, it has been observed that some goods and services are demanded and supplied through the market system and other goods and services are demanded and supplied through the political system, and the former are called private goods and the latter are called public goods. Compared with the former study, Buchanan's definition of public goods does not start from the traditional non-competitive and non-exclusive, but redefines public goods from the perspective of supply [1]. In his conclusion, he emphasized the role of the government in the supply of public goods.

Mancur Olson first introduced the concept of public goods into the analysis of international relations in his study of the role of the state in international organizations. Then it analyzes the issue of improving the incentive of international cooperation when using the concept of international public goods [2]. Olson's definition of international public goods starts from its functions, pointing out that international public goods have a series of positive roles in stabilizing the international financial system, guaranteeing international politics and security, mediating international conflicts and confrontations, and providing international assistance. Charles Kindleberger studied international relations from the perspective of the supply of international public goods. He made the important point that the United States replaced Britain as the world's dominant power, but failed to follow up Britain's role in providing global public goods, which led to the Great Depression in the United States. Robert Gilpin also favors this assertion. Four kinds of international public goods are proposed in the *Political Economy of International Relations*, including a free and open international trading system, a stable international monetary system, credible international security mechanisms, and an effective international aid system. It is believed that international public goods can promote global development, but providing public goods comes at a higher cost, and accompanied by free riding [3].

2.2 The supply of international public goods under the Belt and Road Initiative

From the Belt and Road international public goods supply mechanism, the Belt and Road

Initiative has provided countries along the routes with sufficient infrastructure, scientific and technological public goods, and institutional public goods.

In the perspective of investment in international public infrastructure, it can be divided into three categories, global taxation, voluntary private sector contributions, and international financial innovation. Such as the IMF's use of Special Drawing Rights (SDRs) and International Financing Facilities (IFF) [4]. With the acceleration of asset securitization, various innovative investment and financing models have been applied in the field of infrastructure. Build-transfer (BT), build-operate-transfer (BOT), buy-build-operate (BBO), building-owning-operation (BOO), build-own-operate-transfer (BOOT), and public-private-partnership (PPP) [5]. The PPP model has been widely adopted by various countries. The basic activity of PPP project is the whole process of cooperative financing, cooperative construction, joint management and project handover in the form of relational contract for public works projects [6]. PPP mode introduces private capital in an innovative mode, effectively alleviates the pressure of the government in financing, and has advantages in capital and efficiency [7]. It makes a stable triangular relationship between the government, enterprises and the public, and plays an increasingly important role in the construction of multiple projects such as infrastructure.

In terms of the supply of international public goods related to infrastructure. The connectivity of hardware and software is a key factor in attracting foreign investment and promoting national economic development. The problem of poor infrastructure could become a potential bottleneck to wealth accumulation [8]. Therefore, it is necessary to focus on the key role of infrastructure in the Belt and Road Initiative. The Belt and Road has strengthened the construction of power infrastructure, communication infrastructure, transportation infrastructure and medical and health infrastructure in the ten ASEAN countries and the five Central Asian countries. Lu and Jin [9] taking Lantsang-Mekong sub-region cooperation under the framework of Belt and Road Initiative as an example, it is pointed out that water resources development is an important content of sub-region economic cooperation. With the support of the Special Fund, Myanmar, Thailand and Laos have implemented the installation of automatic water level and rainfall monitoring systems for flood warning systems in the border areas of the Mekong River basin, effectively helping the Lantsang-Mekong countries reduce losses caused by floods and improve their capacity and level of water resources management. In terms of transport infrastructure, Bougheas et al. [10] using data for 16 European countries in the period of 1987-1995, it is shown that infrastructure facilitates domestic and international trade flows, benefiting both domestic and foreign producers and consumers, so there is the problem of international coordination. Infrastructure connectivity has helped the Belt and Road countries to work together to cope with changes in the domestic and international situations. It promotes exchanges and cooperation among countries.

2.3 The significance of the Belt and Road international public goods

The supply of international public goods is an important way involving global coordinated development and promoting the equalization of development levels among regions. As mentioned in the relevant report of the World Bank, public goods are of great significance to the development of a country and the reduction of poverty.

In terms of its impact on the international community. The supply and demand of international public goods are far from reaching the Pareto optimal state [11]. Cooperation between trading

blocs can lead to cross-country spillovers of public goods, which will optimize the current state of international public goods provision [12]. To a certain extent, the construction of the Belt and Road Initiative can fill these gaps, thus contributing to the provision of public goods and effectively reducing the phenomenon of countries shirking responsibilities and lacking the will to take the initiative in the provision of international public goods in order to pursue their own interests. Secondly, with regard to the promotion of economic globalization, China has gradually participated in the globalized governance system by means of gradual reforms, formed a governance system adapted to economic globalization, and modernized its governance system and capacity [13]. However, at present, China's share in many international financial institutions is relatively low, and its voting power is much lower than that of Western developed countries. Lack of appropriate mechanisms to overcome the problem of free-riding [14]. Economic discourse at the international level is not commensurate with the actual size of the economy, and the Belt and Road Initiative is an important way to change this situation. In the Belt and Road Initiative, China has not only made significant contributions in the area of public goods, but has also provided Chinese wisdom and solutions for building a value chain governance model [15], giving full play to the active role of private economic and trade alliances, overseas industry associations and business alliances, and realizing an inter-industry linkage communication and coordination mechanism.

In terms of China's own construction, first of all, the Belt and Road has reshaped the geographical pattern of China's opening up to the outside world. Since the reform and opening up, China's eastern coastal cities have always been in a dominant position in foreign trade, while the central and western inland areas have lagged significantly behind the former. The improvement of transport infrastructure has a significant marginal effect on narrowing the development gap between central and peripheral cities, and can shrink the difference between urban and rural areas to achieve common prosperity [16]. The joint construction of the Belt and Road has promoted the transformation of inland cities into ports, provided a good platform for the westward development of China's inland cities. Second, the growth of global foreign exchange reserves has weakened the single international monetary system, and the growing share of trade between Asian countries in the global arena is prone to currency mismatches if third-party currencies continue to be used as a medium of exchange [17]. In today's dollar-dominated monetary system, the cost of challenging a hegemonic currency to become an international currency can be significantly reduced through interregional collaboration, preventing the use of the exchange rate weapon by the countries in the center of the currency to manipulate international trade [18]. The supply of public goods to other countries through the internationalization platform of the Belt and Road is not only the responsibility of a big country, but also an important way to promote the internationalization of the Renminbi.

3 The necessity of the Belt and Road Initiative

3.1 Basic information about the countries along the Belt and Road

It has been ten years since the Belt and Road Initiative was put forward. According to the relevant statistics of the World Bank, most countries along the Belt and Road are emerging economies and developing countries. Accounting for about 60% of the world's total population

and 30% of the global economy. The countries along the route generally have a long history and are a unity of ethnic, cultural, economic and political diversity. Table 1 divides countries along the Belt and Road into intercontinental regions (see **Table 1**), so as to better cluster analysis of countries in different regions, explore the impact of their economic environment, political background and cultural factors, and measure the regional differences in demand for international public goods.

Table 1. Regional division of countries along the Belt and Road

Region	Country
East Asia	Mongolia
The Association of Southeast Asian Nations (ASEAN)	Singapore, Malaysia, Indonesia, Myanmar, Thailand, Laos, Cambodia, Vietnam, Brunei, Philippines
Western Asia	Iran, Iraq, Turkey, Syria, Jordan, Lebanon, Israel, Palestine, Saudi Arabia, Yemen, Oman, United Arab Emirates, Qatar, Kuwait, Bahrain, Egypt
South Asia	India, Pakistan, Bangladesh, Afghanistan, Sri Lanka, Maldives, Nepal, Bhutan, East Timor
Central Asia	Kazakhstan, Uzbekistan, Turkmenistan, Tajikistan, Kyrgyzstan
the Commonwealth of the Independent States (CIS)	Russia, Ukraine, Belarus, Georgia, Azerbaijan, Armenia, Moldova
Central and Eastern Europe	Poland, Lithuania, Estonia, Latvia, Czech Republic, Slovakia, Hungary, Slovenia, Croatia, Bosnia and Herzegovina, Montenegro, Serbia, Albania, Romania, Bulgaria, Macedonia

data source:<https://www.yidaiyilu.gov.cn>

3.2 The investment environment of the countries along the Belt and Road - A case study of the ten ASEAN countries

With regard to the investment environment of countries along the Belt and Road, Li et al. [19] used the method of measuring the investment environment of countries along the Belt and Road to make a comprehensive analysis on the degree of domestic political stability, convenience of transportation infrastructure and energy and resource reserves of a country, so as to obtain a general description of the investment environment of each country.

The investment environment is the external conditions for investors to carry out investment activities, including the hardware and software resources for investment, which is a system with rich connotation and extension. Favorable investment environment can attract a large number of domestic and foreign capital inflows, is an organic whole of natural geographical location, infrastructure construction, raw materials and mineral resources, domestic political situation, national culture and other factors. The economic environment among the countries along the Belt and Road is relatively complex, with large gaps between the levels of economic development and economic systems of various countries, and marked differences in the level of openness and the investment environment. Therefore, it is necessary to take into full consideration the specific conditions and actual needs of the host country in terms of outward investment, and to gain an in-depth understanding of the host country's investment laws and regulations, capital flow management measures and other relevant information, so as to carry out investment activities in a targeted manner.

3.2.1 Domestic political stability

Infrastructure construction has always been characterized by large investments and long construction periods, which require investee countries to have long-term stable domestic political and social environments. There is a more pronounced gap between the investment environments of the countries along the Belt and Road, assigning a score to domestic political stability. The data are derived from *Global Competitiveness Report 2019*. With the exception of one country, Myanmar, for which data are missing, data for the remaining nine countries are available from the report. In the *Global Competitiveness Report*, a country's political stability is measured by a combination of several indicators, including the degree of national security, the level of social capital, social equity, public sector efficiency, policy transparency, the clarity of property rights, government-business co-operation, and policy orientation. As can be seen in the figure 1 below (see **Fig. 1**), among the ten ASEAN countries Singapore and Malaysia are significantly higher than the other countries in terms of political stability. The low score of the stability of the domestic political environment in Laos is the result of a combination of factors. The Laos is politically stable and has a high level of security, but as it is the only landlocked country among the ten ASEAN countries, it does not have an advantage in foreign trade, and its level of economic development is relatively backward and still mainly based on agriculture. Its economic fundamentals are weak, which makes it difficult for the government to carry out economic activities. As a result, it has a significant disadvantage compared to other countries in terms of the level of social capital and government-enterprise co-operation. In general, however, the political environment in the 10 ASEAN countries is relatively stable, which is suitable for medium- and long-term projects under the Belt and Road Initiative.

3.2.2 Transport infrastructure

Transport infrastructure refers to the physical engineering facilities that provide public services for the movement of goods and travel for social production and the life of the population. It is a public transport service system used to ensure the normal operation of socio-economic activities in the country or region. Infrastructure development has a multiplier effect, which can generate several times the total social demand and national income of the investment.

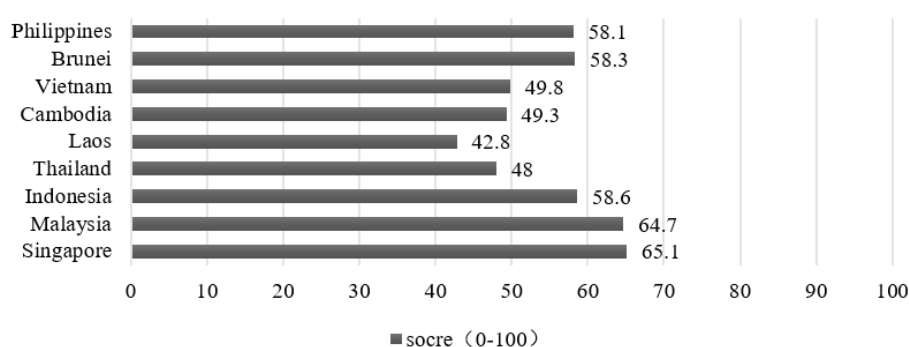


Fig. 1. Scores for the stability of the domestic political environment in the ten ASEAN countries.

It is an important foundation for the long-term sustainable and stable development of a country or region's economy. Data for measuring the extent of transport infrastructure development were

obtained from *Global Competitiveness Report 2019*. The report assesses the level of transport infrastructure development using 8 evaluation indicators: road connectivity, quality of road infrastructure, railway density, efficiency of train services, air transport connectivity, efficiency of air transport services, maritime transport connectivity and efficiency of port services. And these indicators were given different weights respectively and weighted to get the final result. As can be seen from the chart (see **Fig. 2**) below, the level of transport infrastructure varies greatly among the ten ASEAN countries.

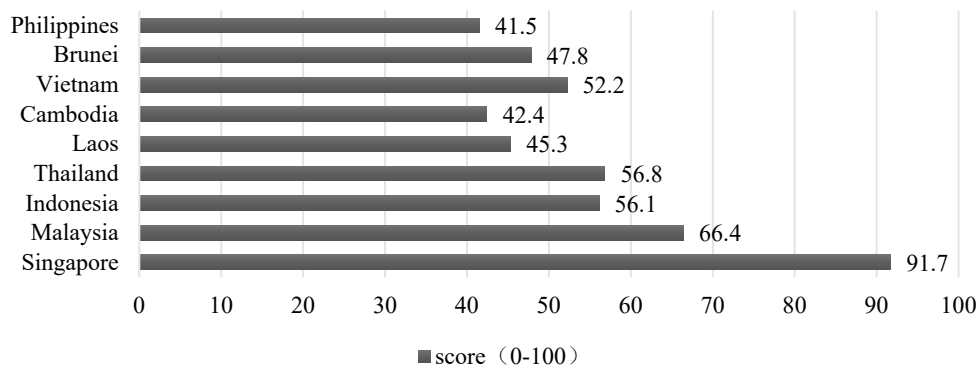


Fig. 2. Scores for transport infrastructure in the ten ASEAN countries.

3.2.3 Energy and mineral reserves

Energy and mineral reserves can contribute to a country's economic development. Adequate supplies of natural resources and energy provide the impetus for industrialization and promote international trade cooperation in energy inter-regional mobility. Energy is traded for the capital needed for development, which in turn leads to the development of knowledge and technology, and also the optimization and upgrading of industries. According to the *BP Statistical Review of World Energy 2021*, energy-related data are available for each country, including oil reserves, gas reserves, coal production, and renewable energy use. As can be seen below (see **Fig. 3**), the ten ASEAN countries are relatively deficient in energy reserves, with only Indonesia having a comparative advantage in coal and renewable energy reserves. At the same time, the economic growth of some of the countries along the Belt and Road is largely dependent on energy extraction, such as the natural gas industry in Russia and oil resources in the Middle East. According to the BP energy report, in 2020, the total oil reserves in the Middle East will reach 83.59 billion barrels, far exceeding the 4.52 billion barrels in Asia and the Pacific countries, so the distribution of energy in the countries along the Belt and Road is relatively unbalanced.

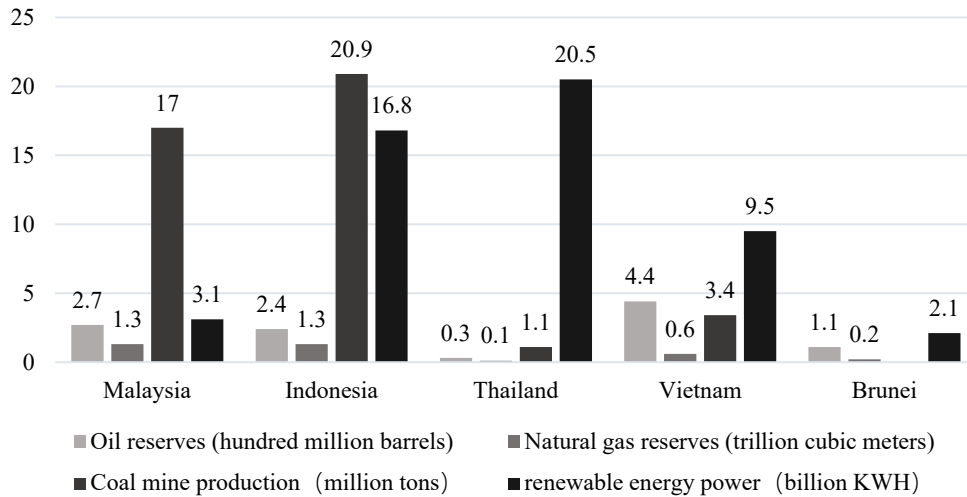


Fig. 3. Energy reserves in the ten ASEAN countries.

4 Achievements of Belt and Road infrastructure development

In the past ten years since the Belt and Road Initiative was proposed, the mutual benefit and win-win situation between China and countries along the routes has been promoted through infrastructure construction, foreign investment and trade (see Fig. 4). Since the launch of the initiative, the total amount of money involved in Belt and Road projects has reached 962 billion US dollars, including 573 billion US dollars of construction contracts and 389 billion US dollars of non-financial investment. According to official statistics, China has launched 200 deals involving more than 3,000 projects, built about 80 overseas economic and trade cooperation zones, and created over 420,000 jobs for local people.

When it comes to the achievement of the Belt and Road Initiative, the China-Laos Railway has to be mentioned. The China-Laos Railway Project is a pass-through railway construction project connecting China and Laos. The opening of the China-Laos railway has brought tangible development momentum to the people of the two countries and has had a significant and far-reaching impact on the current state of economic and social development in Laos. The opening of the Sino-Lao Railway has changed the economic stagnation of Laos due to geographical factors. As the only landlocked country among the ten countries in East Asia, Laos lacks excellent harbors and a long coastline, which puts it in a disadvantageous position in terms of land and sea transport. At the same time, the railway infrastructure of Laos is relatively backward, according to the World Bank statistics, as of 2018, the total length of railways in the country is only 4 kilometers, and the imperfections of the infrastructure make Laos always lag behind in the Southeast Asian economic circle. The opening of the Sino-Lao railway has given Laos the initiative in foreign trade. According to relevant studies by experts and scholars, the Sino-Lao Railway will increase the total income of the Lao People's Democratic Republic by 21 percent. The hard linkage of the railway promotes the connection of the hearts of the people of China and Lao People's Democratic Republic.

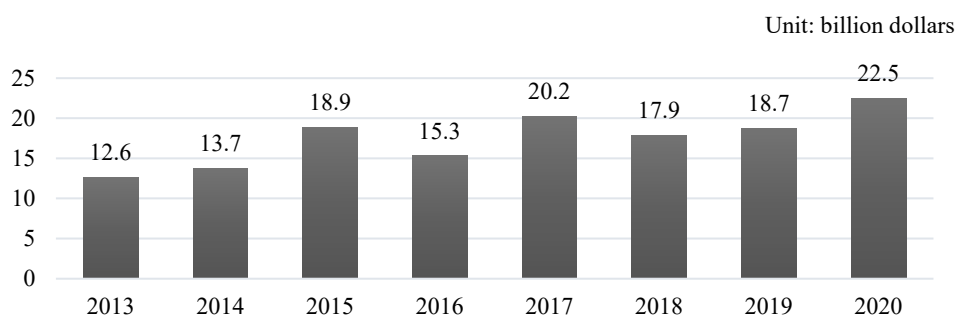


Fig. 4. China's total investment in countries along the Belt and Road, 2013-2020.

In terms of investment sectors, China's investment in countries along the Belt and Road has covered almost all sectors of the national economy. According to relevant statistics from China's Global Investment Tracking Database, the energy industry, mineral resources industry, and transport industry each occupy the top three positions in terms of total investment, with a combined share of 67%. The countries along the Belt and Road have ample reserves of energy and mineral resources, which cannot be fully exploited due to technical and capital constraints. China's financial and technical support for the relevant projects will enable the countries along the route to make effective use of the resources and achieve mutual benefit and win-win results.

5 Conclusion

Public products are characterized by high initial investment costs, high risks and uncertainty in returns, and their return cycles tend to exceed economic cycles, making them prone to credit problems. The areas of investment of private funds usually do not fully cover the public demand for infrastructure, thus leaving a large supply gap. It is difficult to generate active investment incentives by relying on private forces alone without governmental impetus, especially in regions with slower economic development. However, local governments often fail to provide strong financial support and subsidies, and there are more loopholes and problems in the provision of public goods. The Belt and Road Initiative provides a solution to the problem of insufficient supply of public goods, establishing an overall framework of mutual benefit in the process of transnational cooperation and forming a community of mutual assistance, which is essentially an act of altruism.

The Belt and Road Initiative has effectively accelerated the realization of infrastructure connectivity. Low levels of infrastructure are a major constraint to economic development in many Belt and Road countries. Most of the countries along the routes are developing countries, with a greater need for infrastructure development, and there are considerable prospects for international cooperation in this area. Accordingly, the Initiative proposes to give priority to providing assistance for infrastructure development in the countries along the routes, to promote the interregional movement of factors of production through development in the energy and transport sectors, and to stimulate regional and national economic growth. Based on this, China has the ability and willingness to engage in more infrastructure cooperation with countries along

the Belt and Road, and to play a leading role in bringing financial and technical support to other countries.

The Belt and Road Initiative is a strategic vision for the long-term common development of China and the countries along the route. It provides a hugely inclusive development platform that leverages the comparative advantages of the region's economies through connectivity. The Belt and Road Initiative, as a brand-new international public good proposed by China and jointly constructed with other countries around the world, and also as a vehicle for the supply of international public goods, has achieved internationally recognized success in practice. It has become a cooperative platform to effectively alleviate the current shortfall in the supply of international public goods, and to a certain extent, it has solved a number of problems such as the unsustainability of the supply and the exclusivity in decision-making. Promoting improved and effective governance mechanisms for cross-regional cooperation, and leading the current international relations towards a win-win cooperation and interconnectivity. As an important contributor to the globalization process, China promotes world peace and development in bilateral and multilateral cooperation.

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