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The impact of “The Belt and Road Initiative” on the Competitiveness of the Construction industry of China

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Abstract

Improving the competitiveness of the construction industry is an important measure for developing countries. Xi Jinping put forward the "Belt and Road" initiative (BRI) in 2013, which is a comprehensive opening strategy. Not only has it strengthened trade development and opened up new markets for China, but it has also promoted the development of China's construction industry(CCI). In addition to this, it is conducive to cultural exchanges, market investment, and even infrastructure construction between China and the world.

The target of this study is to understand the impact of the "BRI" and to explore the impact of the "BRI" on the competitiveness of "CCI". Porter's diamond model is used as a theoretical framework to analyze the market environment in China. Through reading relevant excellent literature, consulting professors and researchers to collect powerful data, qualitative method is used to explore the data.

The results show that after the implementation of the "BRI", China's market is more open and the construction industry has been developed. China's gdp, ppp, economic and trade development ; the improvement of Infrastructure technologies; the improvement of living standards. It is also important to note that strong government support for the "BRI" plays a key role. At the same time, further research on the "BRI" will help to explore how it enhances the competitiveness of "CCI".

Keywords/tags (subjects)

Construction, Infrastructure, Belt and Road Initiative(BRI), Competitiveness, Diamond model

Miscellaneous (Confidential information)

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1 Introduction

1.1 Background

At present, the “CCI” has a new era. With the continuous increase of the government regulation and control policies for the “CCI”, the overall smooth operation of the construction market. In recent years, people’s living standards have improved and the country’s economy has developed, the total quantity of “CCI” changes obviously. In term of the National Bureau of Statistics (NBS), “the national gross domestic product(GDP) in 2019 was 9,998.6.5 billion RMB, an increase of 6.1 percent over 2018, and a decrease of 0.6 percent over 2018”(Ministry of Commerce of PRC,n.d.), achieving the development target expected at the beginning of the year. In 2019, the development of the country in recent years has led to the development of the “CCI”, and its proportion of GDP has also increased. The “CCI” is indispensable to China's development and is in a stable development stage.

In order to realize China's opportunities to connect with the world and promote economic integration. Xi jinping put forward the “BRI” in 2013. Infrastructure connectivity is a powerful tool for implementing the “BRI”. The investment and construction of a series of major infrastructure projects requires the construction of a comprehensive connectivity network consisting of railways, roads, aviation, ports and communication networks. This has changed the difficulty of deepening cooperation between countries along the “BRI”, and provided a good opportunity for their respective development.

The “BRI" global innovation meeting was held in China on December 7, 2017, This affirms that the “CCI” is very important in the construction of the "BRI". What’ more, Fang qiuchen, president of China chamber of foreign contractors, said that the construction market along the “BRI” line has strong demand, strong business development, and the investment heat of infrastructure construction is significantly increased, with a good future development prospect . (Fang ,2017.) 80% of the construction business contracted by foreign companies is concentrated in the five

fields of transportation, electric power, housing construction, communication and petrochemical industry. The “CCI” have fully joined the international infrastructure construction, production capacity cooperation, energy and power development and construction. Which accounted for 21% of the global market share, which means that in the field of global infrastructure construction, one-fifth of the companies are Chinese. (Fang ,2017.)

Facing the development investment needs of construction, China's equipment technology and production requirements have established a bridge in transnational cooperation and provided development opportunities between countries. Under the “BRI”, the “CCI” has been greatly developed. It focuses on developing countries in Europe and Europe and involves over 60 countries . In the future, along the route with a construction scale of us US$44.6 trillion in 2030 .(Chen, 2019.) This development strategy not only meets the needs of economic and trade development, but also brings good development opportunities to the “CCI”.

The “CCI” conforms to the trend of the times, seizes opportunities, vigorously promotes the industrialization of construction internally, promotes the reform of the “CCI” in terms of capital, brand, management, etc, and realizes the cyclical promotion of enterprises and industries; and under the "BRI", it is also actively expand overseas markets, and promoting enterprises to enter into the upgrading and transformation of "going global". Moreover, countries with underdeveloped infrastructure along “BRI” are all markets to be developed, which lays a foundation for improving the competitiveness of the “CCI”.(Fang, 2017.)

1.2 Motivation for the research

For the country’s development, China’s participation in the World Trade Organization also has an important and far-reaching impact on the “CCI”. The "BRI" is considered an ambitious strategy, which has also promoted the development of the “CCI” and the development of new markets. Under the call of the “BRI”, the development of the “CCI” has become the next important trend, high efficiency and low cost make

the “CCI” develop rapidly.(ward ,2018.) Meanwhile, It also promotes trade development of other countries and provides opportunities for infrastructure construction. For countries with poor economies, the construction industry is the key, because their infrastructure is not yet complete. Housing, schools, ports, communication networks and other infrastructures need to be developed to enhance the country’s development and improve people’s quality of life. In the past 10 years, the construction industry has been affected by the sluggish economic environment. The absolute value and growth of the output value of the “CCI” are not very optimistic. However, due to the “BRI”, the “CCI” has been developed, bringing hope and opportunity to the “CCI”. From this perspective, infrastructure construction has improved the progress of the “BRI” project, promoted the development of infrastructure, and changed its downturn.

The “BRI” provides a door for the exchange of development projects between states, and also provides new opportunities for China’s construction companies to invest in overseas construction. For example, it has the opportunity to participate in related domestic and foreign infrastructure projects, such as railways, ports, tunnels, etc.“BRI” provides constrution companies with opportunities to open up markets, and provides an opportunity to demonstrate building techniques. The priority area of the “BRI” is infrastructure construction, which opens a new external market for the “CCI” to "go out", enterprises are going out and developing rapidly. (Chen ,2015.)

I'm interested in the “BRI” because I'm majoring in international business. In addition, construction is the key to the development of a country, Meanwhile, the development process and practice of the “BRI” are inseparable from it. It can be seen that it makes sense to explore how the “BRI” can improve the competitiveness of the “CCI”.

1.3 Research approach and structure of the thesis

The following explore the problem is formulated:

How does the “BRI” affect the competitiveness of the “CCI”?

Social development in recent years, people's demand for living standards is getting higher and higher. In order to achieve the country's goal of prosperity, China actively communicates with foreign countries and increases trade and investment. The creation of the "BRI" has promoted the exchange and development of international trade, promoted the progress of infrastructure construction, facilitated project investment, and met people's needs. Under the "BRI", China's annual economic and trade income has increased significantly, the infrastructure index has improved, the country's economy has rapidly improved, and the quality of life has been upgraded.

For my exploration question, I use the method of qualitative research to answer it. Under the "BRI", the competitiveness of the “CCI” has been affected to a certain extent. Therefore, it is important to explore this research, as well as to collect and analyze relevant data. Qualitative research is suitable and flexible for my research objective. (Denzin & Lincoln ,2011.)

1.4 Structure of the thesis

According to the chapter, chapter 1 is the background introduction and research method of my research topic and problem. Chapter 2 is the literature review part about exploration, which refers to the relevant theoretical basis and data information in the exploration and analysis of the researcher to further understand and explore the problems and goals of the research. In chapter 3 mainly introduces and explains in detail the methods of exploration and information collection and analysis. In chapter 4, "results", the researcher ready to answer the exploration questions clearly. Finally, chapter 5 is "Discussion & Summary", which involves the summary of the research, the discussion of relevant literature results, and my suggestions for future related research.

2 Literature review

2.1 Concept of The Belt and Road initiative

The “BRI” is famous because it is one of the important economic links between China and many countries. As mentioned earlier, the “BRI” is an important strategic project proposed by Chinese President Xi Jinping. The “BRI” is a channel across the mainland. (Xi, 2013.)

China's the "BRI" development strategy means to establish connections and cooperation between China's six major economic corridors. It is estimated that by 2030, Asian countries will invest about US$26 trillion in infrastructure (Asian Development Bank, 2017). China can have a positive impact on relevant countries through investment in infrastructure construction. This will help expand the market for Chinese products and reduce the problem of industrial capacity expansion. "BRI" will attach importance to the construction facilities and capital of the project.

The "BRI" reformulation expanded the spiritual outlook and geographical conditions of the previous Silk Road. This is an ambitious strategy. (Frankopan, 2019.) It has a wide range of contacts, such as political exchanges; economics and trade; joint project investment and financial services; infrastructure connectivity; regional control and so on. (Gu, Corbett & Leach, 2019.)

As Chinese officials said, the goal of the “BRI” is to stimulate and facilitate infrastructure investment, and to establish exchanges between China and other countries. As China’s former Vice Minister of Foreign Affairs He Yafei said: the true meaning of the “BRI” is to have better contacts and exchanges in many aspects. (He, 2017.) Developing and cooperating with new economic projects under the “BRI”, China is creating new ideas for governance between regions . (Belt and Road Consulting ,2018.)

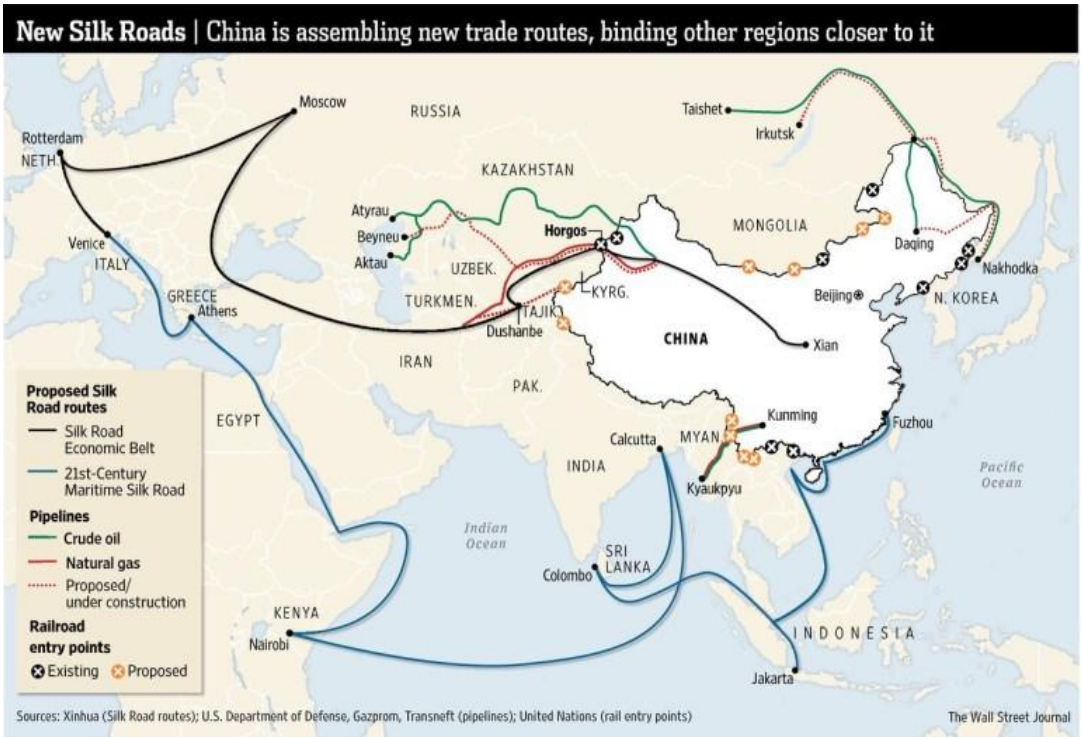

Figure 1. The “BRI” Route Map (Maraczi ,2017).

2.2 Competitiveness

2.2.1 Concept of competitiveness

In general, there is no unified concept of competitiveness. It involves different aspects, and its essential meaning is also different. In economics, its terms are generally used in domestic or international market competition. Before David Ricardo explained its concept in many ways. (Ricardo, 1819.) Nowadays, due to the globalization of the world economy, competitiveness has also become a key factor for companies, sectors or countries to successfully join in the global economy.(Zagloel, 2016.)

Because of the multi-dimension and complexity of competitiveness, its definition and measurement will be different. The concept of competitiveness varies with the level, but its concept is also different, there is also a certain connection between them. For example, competition at the enterprise stage may affect the department, and competition at the departmental stage may eventually affect the country. On the other hand, various national rules and systems will also affect departments and

enterprises. This can also generate regional industrial competitiveness.(Zagloel, 2016.)

At the company level, as Edmonds (2000) said before, a competitor is defined as "the capability to produce goods and services at a reasonable price at a reasonable time and at a reasonable price. Such a company can save costs and be effective The production products and operation services of the company also meet the expectations and needs of customers. Meanwhile, it can also be assumed that the company can make more money, increase the company's orders, and make other companies have no orders, so that other companies have no competitive advantage. (Zagloel, 2016).

At the sectoral level, Porter (1990) previously defined competitiveness as the capability of various business activities to create sustainable growth and a stable and high-quality life for the country. Meanwhile, Saptana (2010) explained the concept of "competitive advantage diamond" in his book "National Competitive Advantage", which roughly explains the four factors that determine the competitiveness of an industry, as follows:

1. The factor condition is probably the country's position in the production factors needed in the competition for the industrial sector, such as infrastructure.

2. Demand Condition (demand condition), this condition is probably the natural market's demand for industrial products or services.

3. Related and supporting industries are probably the existence of supplier industries and other competitive related industries.

4. Firm strategy, structure, and competition are probably the nature of how the government supports and assists the business environment and domestic competition.

In order to further understand and analyze the competitiveness of the industrial sector, a tool is needed to help measure the competitiveness of the industrial sector. (Zagloel, 2016.)

In the past few decades, with the continuous changes in the economic and market environment, competition between countries has become more and more intense. Every country hopes to have a certain degree of influence and status in the global market economy to prevent all risks brought about by globalization. (Ganna, 2013.) Increasing competitiveness has led to economic growth and national development. Through the data analysis of the "2015 Global Competitiveness Report", a conclusion is drawn: the more competitive the economic market, the less it will be affected by external factors. (Schwab, 2015.)

2.2.2 Industry competitiveness

The competitiveness of an industry consists of two main parts: production conditions and the use of these conditions. The production conditions are mainly determined by the external factors of the companies that make up the industry. The utilization of production conditions conforms to the classical economic concept of structural efficiency. (Asmild, 2019.)

The company has its own strategies to reduce costs, improve product quality and find marketing networks. However, due to the inherent failure of the market in key areas, the government's support for competitiveness means that it can compete with companies that are at the forefront of international best practices. Moreover, it has been proved in some cases that the key part of the competition is the competition brought by the company rather than the country, and it has developed its own capabilities in different ``markets''. For example, infrastructure construction, financial services, technology and industrial clusters, etc. If any of these "markets" are not performing well, competition policies need to be formulated. (Peter McCawley, 2004).

In today's globalized market, the competitiveness of the industry plays a key role. It can stabilize and promote the development of the industry in the global market. Therefore, whether in terms of performance or prospects, competitiveness in the industry can usually be used as a measure. (about FWC industry competitiveness in 2007-2012). Industry competition (or competition between existing companies) is also one of the five forces Porter uses to measure industry competition. (Porter, M 1998.)

Industry competition usually adopts various strategies to compete for position. When the company can feel the pressure of competition or is in a position that can improve the company's market position, then its competitiveness will increase significantly. (Porter, 1998.)

2.3 Theoretical framework

The diamond model was created by Porter to analyze the country's environment, especially its competitive advantages.(Porter, 1990.) The diamond model is based on the location of some companies to explain the reasons behind their success. Riasi feels that Porter's model uses four determinants to assess global competitive advantage.(Bakan & Dogan, 2012.) (Figure 2) These four determinants are mainly used to evaluate the global business environment. It is worth noting that as long as one determinant changes, other determinants will change. (Riasi, 2015.)

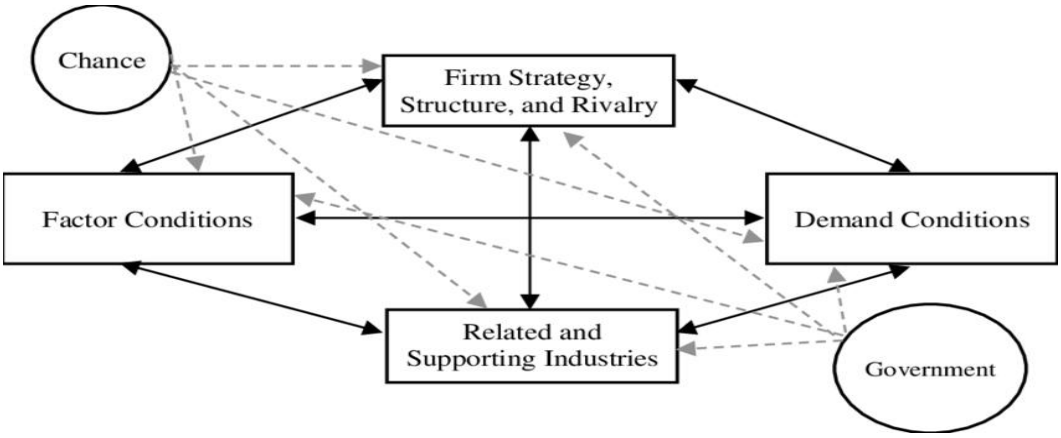

Figure 2 :The Diamond Model(Porter, 1998.)

Factor conditions are factors of production, as well as attributes that are obvious in the country or region, such as natural resources or domestic production factors, such as infrastructure.(Porter,1993,77.) The factor conditions are competitive in areas with high-tech markets and infrastructure. Human resources are also regarded as part of the essential conditions, which are created by the state. If competitiveness is to be improved, these factors and conditions need to add significant value to the country. Bakan & Dogan (2012, 444) believe that factors and conditions can also be divided into basic, progressive, professional, general, ethnic and genetic factors.

Natural resources are resources that exist without human participation, such as sunlight, air, water, land, and all plants and animals. (Natural Resources Article) According to the restoration rate, natural resources are divided into renewable and non-renewable resources. "Renewable resources" are recyclable and are not greatly affected by human consumption. However, "non-renewable resources" are slowly decreasing with consumption.

Infrastructure is the material basis of any society. A country's infrastructure plays a key role in determining its economic and social development trajectory , Daniel Vice. Runde mentioned.(Daniel V. R) High-quality infrastructure uses reliable and best technology to make it more reliable, economical and environmentally efficient, and comply with internationally recognized safeguards and standards. At the same time, high-quality infrastructure investment should be consistent with the country's long-term economic development strategy to improve service flows, build local capacity and promote employment. So the economic foundation depends on continuous high-quality infrastructure. High-quality infrastructure has brought direct positive effects, including improving efficiency, improving safety, reducing environmental impact, and improving public goods and services more effectively.(ibid)

Demand conditions are a key factor to promote the development of enterprises, but Porter's attention to domestic demand only applies to certain industries. In today's globalized market, most industries are also in the stage of globalization. (Levitt, 1983). In many cases, each competitor has to establish a good foundation in each triad market in order to succeed.(Ohmae, 1985.)

In previous research, “Porter chose the country’s exports and foreign investment as the criteria for measuring international competitive advantage (page 25). Meanwhile, he used the country’s internal demand as a lubricant for international competitiveness. What’s more, he also pointed out that, when domestic demand and foreign demand are close to similar, their competitive advantage is revealed."

Internal demand can promote the development of the industry, and can also promote the competitiveness of the industry. The domestic market clearly shows their demand. Therefore, this puts a certain amount of pressure on local companies, requiring them to make faster decisions than their foreign competitors, enabling them to gain mature advantages. Due to the pressure and challenges of competitors, local companies can also harvest some information that is conducive to the company's strategic development from competitors, customer demand phenomena and suppliers. (Porter 1990, 190-191.) In the communication between the company and its customers, the resonance of the culture and the three views makes the company's business processes clearer, easier to communicate, and easier to take action. (Porter 1998, 86-87)

Related industries and supporting industries are focused on other industries that can be considered internationally competitive in the country. (Porter 80.) Related industries and supporting industries within the country that are internationally competitive are beneficial to competitiveness by improving knowledge, innovation, machinery, cost-effective processes and beneficial working relationships. Porter believes that the related industries of foreign suppliers can hardly replace local suppliers.(p. 103)

In the current global business market, multinational companies usually like to find suitable related and supporting industries as their partners. This is also because of the successful combination of advantages generated by different geographical locations, which leads to global competitiveness, rather than relying solely on relevant and supported enterprises in the domestic economy. (Moon, Rugman &Verbeke,104.)

Firm strategy, structure and rivalry emphasizes the importance of culture of where the company operates. (Porter 1993 81.) “Northern countries and Southern countries in Europe have different type of organizational structures and strategies, and without understanding these factors competitive advantage will not be accomplished. Some industries are formed in certain countries because of these structural and strategical characteristics and thrive in these areas because of it.” Rivalry will increase innovations, for example sustainability will have more focus if some of the local companies gain competitive edge by providing it. This will force competitive companies to innovate towards customer preferences. Rivalry shows how competition will reinforce the domestic market by creating platform for constant improvement. (Porter,1993,83.) Rivals create a competitive advantage by forcing companies to compete from the customers. Competitive advantage inside a nation has been seen as negative factor, but Porter reminds that efficient rivalry inside a nation increases the nation’s ability to compete over foreign companies.

3 Methodology

The implementation of research methods in order to properly answer the corresponding questions and follow a certain methodology can effectively and reliably guide the research and answer the predicted goals. Therefore, the topic, background and goal of the research should be highly relevant to the research selection, and then the appropriate research method should be determined.

3.1 Research approach

The way is suitable for this explore topic is qualitative explore way in essence. Qualitative research way can search for causality and relationships between variables, but it does not propose new theories. In fact, the researchers will refer to the relevant literature covering the theory. In fact, evaluate and measure the influencing factors of the construction industry under the “BRI”, and try to find out how the “BRI” affects the competitiveness of China's construction industry.

Qualitative research methods are most suitable for this study, there are no standard concepts for qualitative research, and no related theories and templates.(Denzin & Lincoln, 2011.) In qualitative research, there is a connection between the researcher's goal and the theoretical framework. Among the theoretical frameworks, there are previous research findings and exploration theories; methodology selection is another aspect of preparing qualitative research papers. These depend on which case to choose, how to collect and how to select data for analysis.(Crescentini & Mainardi ,2009.) Qualitative research relies on data and information collected by researchers from observations, interviews, questionnaires, records, and documents.

In addition, the explore method is a longitudinal case study, the reason is that the “CCI” has affected the competitiveness of the construction industry under “BRI”. Choosing a longitudinal approach for this study will help assess the affect of the opportunities and risk elements under the "BRI" on the objectives. And then, the advantage of conducting longitudinal research in this study lies in its ability to show changes and development, which is closely related to my research purpose. The researchers will analyze data related to the construction industry after the implementation of the “BRI” to find out how the”BRI” affects the competitiveness of the “CCI”.

Therefore, after the researchers determined the topic, identified the problem and defined the research objectives, combined with the review of relevant literature.

3.2 Research context

This is a way for readers to discuss topics in more depth. Especially reading, understanding the relevant literature review to combine with the understanding of research topics. In other words, this is a background description of the topic to allow readers to understand the motivation and meaning of the research topic. Now readers should explore the changes in the competitiveness of the construction industry by reading related literature reviews on the subject.

The research context of this topic is that China is implementing a majestic strategy called the “BRI”.

The strategy is to use global transportation routes and rely on core cities along the “BRI” to jointly establish new economic ties and joint engineering investment platforms on land, sea and air. At sea, we will jointly build key port passages along “BRI”, and jointly build smooth, safe and efficient transportation passages. To promote the development of trade cooperation and investment in construction. The construction of the “BRI” is a grand economic vision for the countries along the route to open up and cooperate. All countries work together to advance towards the goal. Strengthen infrastructure construction, gradually form a safe and efficient sea, land and air channel network, further improve the quality of interconnection, further improve the facilitation of project investment, meanwhile, bring the economy closer. (NDRC ,2015.)

A large part of the the “BRI” is basic transportation construction. It is mainly the construction of transportation facilities in the countries along the route, such as roads, ports, gas filling channels, communication equipment, power supply and other infrastructure.(See Figure 3).

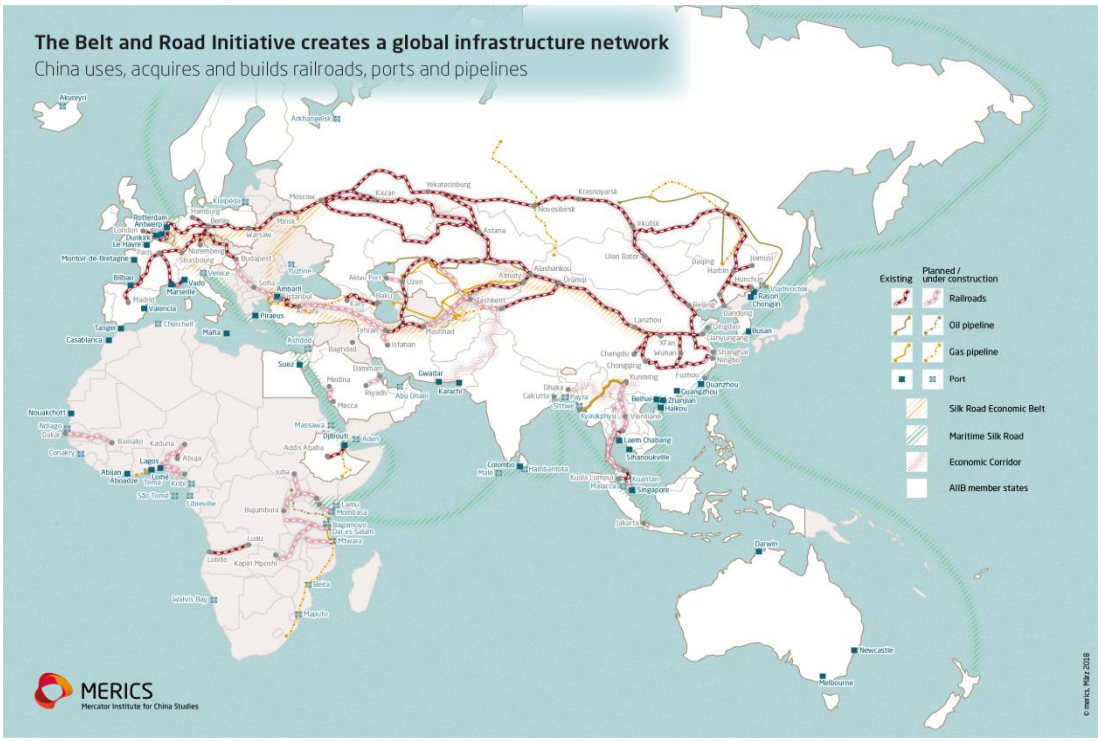

Figure 3 .The “BRI” creates a global infrastructure network .(Belt and Road Advisory ,2018).

In building the "BRI" , in addition to the need for a large amount of financial support, some risks and opportunities will inevitably be encountered. As follows:

1) The construction of the “BRI” economies and the differences in systems have affected foreign investment. Even if new construction can help reduce these gaps, the cost is high and it will bring debts.

2) The transportation network along the “BRI” can reduce costs to increase investment and promote the development of poor countries, but for very poor countries, this will also bring huge debt problems.

3) The “BRI” faces common risks of large-scale infrastructure projects. The openness and transparency of the initiative is limited, which will exacerbate these risks. (World Bank, 2019)

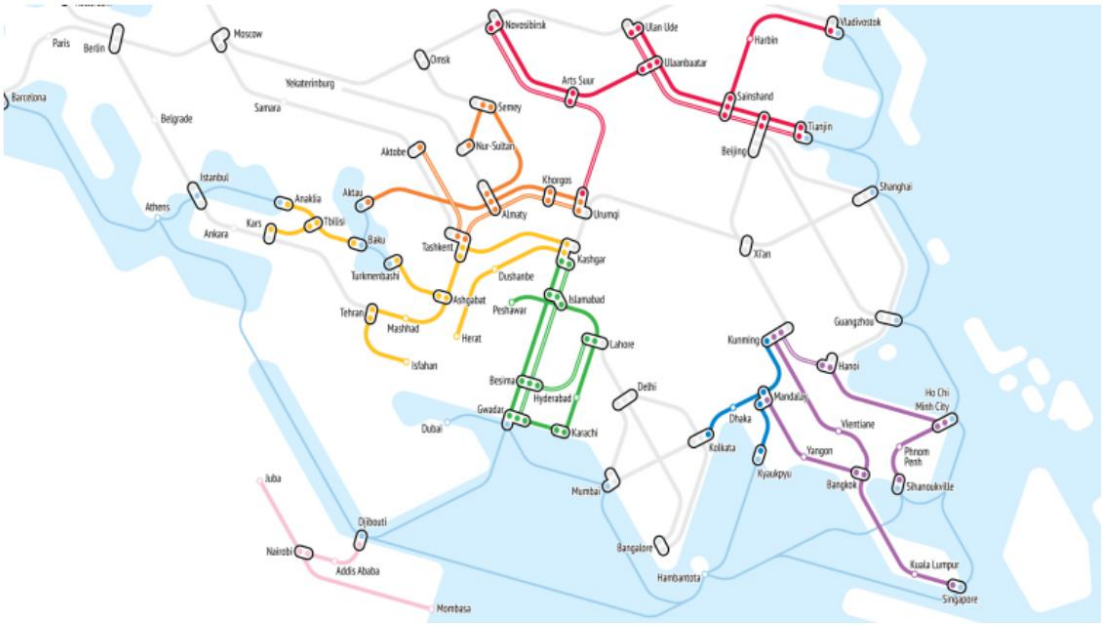

Figure 4. The six overland corridors of the Silk Road Economic Belt and the 21st Century Maritime Silk Road.(The World Bank, 2019)

3.3 Data collection

Data collection refers to an exploratory process of collecting, testing and analyzing research information using professional verification techniques. Then you can prove whether the researcher's hypothesis is accurate through the analysis and evaluation of the collected data information. The acquisition of data is indispensable in every research process, and for different research directions, researchers use different methods of information collection.

In this research, data was collected and refined using secondary data. Will choose to use the theoretical framework, Porter's five forces analysis. Used to collect relevant information to help achieve the purpose of exploration or answers to research questions. I will collect primary data through interviews to help find the correlation between primary and secondary data. In this exploration, i will rely on information in interviews and authoritative websites.

Secondary data

Secondary data comes from the information data obtained by other people's research in other fields, and those who learn from it often screen and analyze these data. Use these suitable data to provide reliable choices for researchers who lack resources. Its analysis mainly uses raw data to apply to those studies that have similar research concepts and methods, and these studies follow related rules. Meanwhile, the secondary analysis is a relatively mature analysis method, with procedures and evaluation levels in its system. (Melissa P. Johnston, 2014). And it also includes three subgroups of secondary data (Figure 5) as follows:

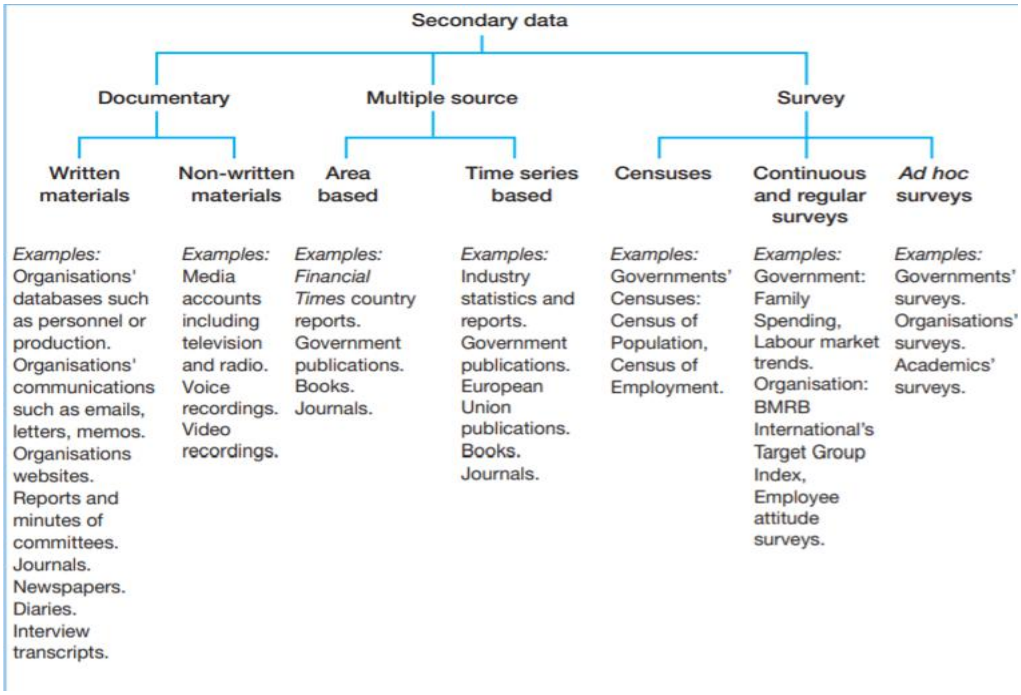

Figure 5. Secondary data (Saunders, et al. 2007)

Documentary secondary data is often used for reference in research exploration, and these studies will also use the original data collection method. Documentary secondary documents are divided into written and non-written materials. Written materials include records, reports, speech texts, magazines and periodicals, etc; non-written materials include pictures, videos, sounds, etc. They can all be used to aid research.(Saunders, et al. 2007.)

Survey-based second-hand data based on surveys are usually collected through questionnaires. The questions in these questionnaires are carefully created. The scope of the survey questions can involve governments, institutions, companies, schools, families, and individuals. field. Survey-based auxiliary data are usually collected through three types of survey programs: census, continuous/periodical survey or special survey.(Saunders, et al. 2007.)

Multi-source secondary data relies on data information in literature and survey assistance. Multiple-source secondary data can also be used to quantify geographic and time-based information, such as government and organizational publications.(Saunders, et al. 2007.)

The secondary data collection method is suitable for research and exploration, but there are some shortcomings. Advantages: it can save resources, especially time and money; it also provides an unobtrusive measurement method; longitudinal research may be suitable; and it may be impossible a new discovery foreseen; it is still permanent data. However, disadvantages: the purpose of the collected second-hand data may not meet your needs; it may be expensive or challenging. For example, collecting data for market confidentiality is expensive and challenging; second-hand data may cause other problems, including ethical issues; data quality is more difficult to control; the original purpose is likely to affect the way the data is presented. (Saunders, et al. 2007.)

This information used in this research mainly comes from books and periodicals, based on the construction industry-based the “BRI” report, and articles. The qualitative and quantitative data provided by these data sources will be used to search answers. This information in this research mainly comes from various websites on the internet. The most commonly used data is mainly about the construction industry development report of the “BRI”.

Primary data

Primary data is the information obtained by the researcher in the exploration, which is different from the secondary data. Because it is connected to the topic or goal, meanwhile, it can answer the question, it is original and highly accurate. Primary datas are collected by various techniques in three main methods: (a) observation; (b) conducting interviews; (c) using questionnaires. Each method has its own advantages and disadvantages, which are suitable for specific research topics and goals. (Saunders et al. 2009, 288-360.)

Observation is also a method often used to obtain information during research, and it will make research information rich and colorful. Moreover, observation is frequently used in life and studies, such as the observation, description, interpretation and analysis of people, things, and things. (Saunders et al. 2007 282.)

Interviews are usually targeted discussions between two or more people. Interview is to obtain relevant research information directly, effectively and accurately through discussion with interviewers. In addition, depending on the purpose of the interview, the interview type is different.(Saunders et al. 2007, 310-313)

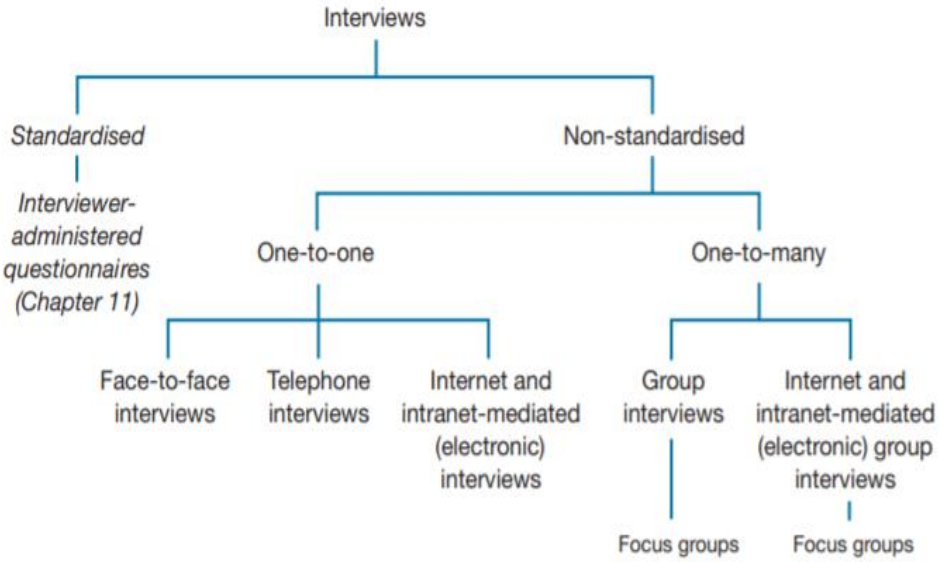

Figure 6. Forms of interview (Saunders et al. 2007, 310-313)

Questionnaires are part of our daily life, it is used to collect data when we research questions and investigate situations. However, the design of the questionnaire is different according to its management method, especially the number of contacts with the survey research object.(Saunders et al. 2007, 354-357)

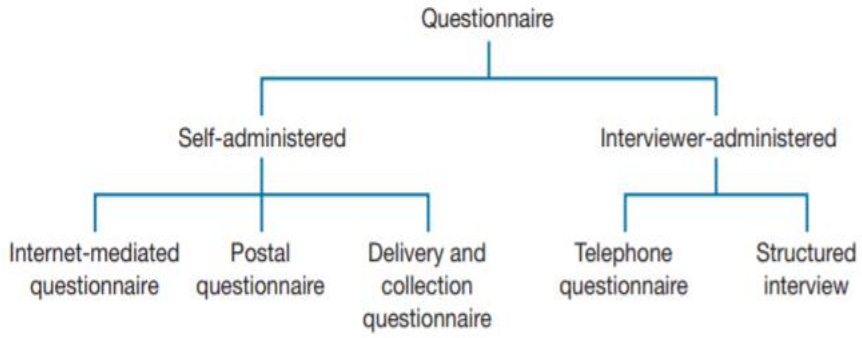

Figure 7 . Types of Questionnaire (Saunders et al. 2007, 357)

In order to further understand the the “BRI” and to obtain research questions about the impact of the “CCI” under the “BRI”, the author will take one-on-one interviews to obtain the data needed for the research. Interview questions will be shown in Appendix 1.

3.4 Data analysis

This chapter introduces the data analysis technology or analysis process used in the research report. Search through the selected framework to understand and analyze variables. Data analysis is a process that includes implementation to organize, classify and analyze data based on the original collection of research content. Different patterns are mainly feedback from the data used in qualitative data analysis.

Figure 8. Data analysis process for the research.

Based on this research question, goal and experience question. The data analysis is mainly based on the model described in the theoretical framework of the four major determinants of Porter Diamonds, and also includes background factors related to the industry, corporate strategy and industry competition.

In addition, the content of face-to-face interviews (in Chinese or English) will be uniformly converted into English. The answer data collected in the interview will be summarized in a table, and coded and sorted according to the theme of the theoretical framework. I will mark the interviewer's name and identity in the recording file to facilitate data analysis.

Below Table 1 show how author analysis the data:

	A	B
Research question		How does The Belt and Road Initiative affect the competitiveness of China’ s construction industry?
From the theoretical framework		
Code		Explanation
F		Factor Conditions
D		Demand Conditions
R		Related and supporting industries
S		Context for strategy and Rivalry

Table 1 . Coding for data analysis

Code	Text from data sheet	Location of text	Analysis comment
F	The school provides professional guidance.	Interview 1 page 1	This is higher education for related majors.
F	Schools and companies will conduct professional	Interview 2 page 1	Project personnel receive professional training.
F	Overseas students can have the opportunity to	Interview 1 page 1	Promote communication with overseas.
F	Many students exchange studies with overseas	Interview 2 page 2	The Belt and Road Initiative opened up international exchanges and learning.
F	Building railways and highways between China	Interview 1 page 2	Create transportation and energy transportation system routes.
F	Construction of railways between China and	Interview 2 page 3	Strengthen the system development of transportation.
F	China cooperates with overseas countries.	Interview 1 page 3	Strengthen cooperation and exchanges with foreign countries.
F	Cooperation between China and foreign	Interview 2 page 4	Promote the exchange of trade and construction cooperation between China
D	Construct railways and highways, and actively	Interview 1 page 4	Promote the construction and development of China and countries along the
D	Building infrastructure has increase	Interview 2 page 5	The development of the construction industry promotes the formation of
R	The more investment in overseas cont	Interview 1 page 6	The increase in investment funds has promoted the development of the Bel
R	The increase in investment funds and	Interview 2 page 6	The increase in overseas investment promotes the development of the cons
R	The development of the construction	Interview 1 page 6	The development of construction provides new markets for industrial clus
R	Construction and development to poor	Interview 2 page 7	Promote construction development and economic development.
S	The establishment of financing banks	Interview 1 page 7	The government promotes the development of construction and provides fir
S	The government has launched a series	Interview 2 page 7	The government promotes the development of construction.

Table 2 . Sample of data analysis.

3.5 Verification of findings

Validity

The effectiveness of qualitative research means the validity of measures, circuits, and information. Whether the design, method, and result selection when researching the problem is effective for the background of the research topic. The selection of

methods must be able to detect and find results in suitable context. For the collection of samples, the process and ways must be compatible with the research and distinguished from systematic, purposeful or theoretical sampling.(Leung ,2015.)

Since the research has a clear goal, the data needed by the research can be gained from the official website , organization or bank and the official website of the “BRI” in terms of the theoretical framework. The data collected follow the Porter Diamond Model. At the same time, read the literature review on the "BRI" and "Construction Industry" to obtain the required data. Appropriate content data analysis techniques have been used to analyze the data, and relevant conclusions have been drawn after the analysis.

Reliability

Reliability means the researcher's use of appropriate design ways on the research topic to make the research process and results accurate. In different qualitative studies, this definition is not only reliable, but also challenging. (Leung, 2015.) Therefore, to ensure reliability, the information collected from the official website are referenced and interviewed.

In addition, as a means of testing the primary and secondary data, the researchers applied the triangulation method to ensure reliability, and strictly reviewed the reliability of each data source to confirm the same conclusion.

Objectivity

Since the“BRI” was proposed in 2013, different people have different opinions on it. Although this initiative can promote national development and at the same time provide various opportunities, it also faces various challenges and difficulties. For this research topic, researchers can refer to relevant data from the World Bank, World Business Forum, government officials, the "BRI", "Construction Industry" and other authoritative organizations website. Using substance analysis technology is the correct medium for this research, all information comes from different sources.

Although the researchers are not professionals engaged in the“BRI” or the “construction industry”, there are relevant sources for every data studied.

4 Research results

This section bewrites the research results, mainly based on my theoretical framework as the direction of this research to explain the answer. Through secondary data and interview data, in accordance with theoretical framework, to explore the affect of the “BRI” on the competitiveness of the “CCI”. Therefore, communicate answers to research questions in a clear, logical, and easy-to-understand manner.

4.1 Factor conditions

Physical Resources

China is a superpower , the land area can reach 9.6 million square kilometers. China has rich mineral resources, among which 163 types of minerals have been explored and understood. Hydropower resources are also extremely rich, with a water area of 4.7 million square kilometers. Meanwhile, China has extensive deposits of coal, oil and natural gas. In addition, these fossil fuels, China's mining of natural resources such as gold, iron ore and coal is a leader in the world. (Blaettler, 2018.)

In the“BRI”, natural resources are vital to the construction of the“BRI”. For example, the communication lines, infrastructure, ports, power network systems, gasoline, natural gas, etc. Natural resources are indispensable in the construction of the “BRI”. In addition to being used in the construction industry, China's natural resources are also exported to other countries that lack natural resources.

No	Mineral	Unit	2016	2017	Growth rate/%
1	Coal	Billion tons	1598.00	1666.67	4.3
2	Oil	Billion tons	3.50	3.54	1.2
3	Natural gas	Billion cubic meters	5436.55	5522.10	1.6
4	Coalbed methane	Billion cubic meters	334.40	302.54	-9.5
5	Shale gas	Billion cubic meters	122.41	198.29	62.0
6	Iron ore	Billion tons of ores	84.06	84.89	1.0
7	Manganese ore	Billion tons of ores	1.55	1.85	19.1
8	Chromite	Thousand tons of ores	12331.90	12202.40	-1.1
9	Vanadium	Thousand tons of VO	64017.70	64281.60	0.4
10	Titanium	Million tons of TIO	786.00	819.00	4.2
11	Copper	Million tons of metal	101.11	106.08	4.9
12	Lead	Million tons of metal	85.47	89.67	4.9
13	Zinc	Million tons of metal	177.53	184.94	4.2
14	Bauxite	Million tons of ores	4852.00	5089.00	4.9
15	Nickel	Thousand tons of metal	11183.70	11180.70	0.0
16	Cobalt	Thousand tons of metal	672.50	687.80	2.3
17	Tungsten	Thousand tons of WO	10159.50	10304.20	1.4
18	Tin	Thousand tons of metal	4453.20	4500.40	1.1
19	Molybdenum	Thousand tons of metal	28824.10	30067.80	4.3
20	Antimony	Thousand tons of metal	3072.40	3197.60	4.1
21	Gold	Tons of metal	12167.00	13195.60	8.5
22	Silver	Thousand tons of metal	275.20	316.00	14.8

Table 3. Remaining reserves & Resources of major minerals in China.(Ling , 2018.)

Human resources and Knowledge resources

China has a population of approximately 1.4 billion and is composed of 56 ethnic groups. This shows that China has abundant population resources. (See Figure 9) Investment in the cultivation of human resources is indispensable for China's prosperity today.

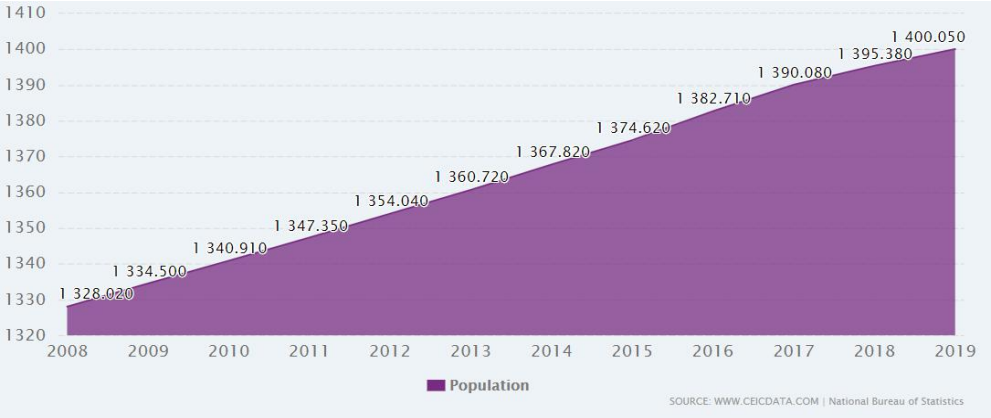

Figure 9. China's population from 2008 to 2019.(National Bureau of Statistics, 2021.)

In 2010, the Ministry of Education issued a nearly 10-year education reform plan. Its strategic goal is to realize modern education by 2020, become a learning society, and strive to become a country rich in human resources. This shows China's determination to build an excellent education system to realize the popularization of higher education. Promote the training and development of human resource construction skills and enrich our country's human resources. In 2011, at the 100th anniversary of the founding of Tsinghua University, Hu Jintao stated that Chinese language education is the core of high-level education in order to continuously improve its quality. (Chen , 2013.)

As of 2019, there are 530,000 educational institutions nationwide. (Cao, 2020.)In order to build innovative universities, cultivate innovative talents, strengthen the construction of scientific research and innovation systems, and enrich the training of human resources knowledge and skills in my country, the development and construction of higher education is of great significance. In 2019, the quality of China's higher education has improved, the teaching system has been improved, the coverage has continued to expand, and the teaching quality of the teaching staff has also improved. There are 2,956 higher education institutions nationwide, with 40.02 million higher education students, and 2857 out of every 100,000 people have obtained higher education. The number of college graduates reached 640,000, an increase of 35,000 over 2018, an increase of 5.8%.(Cao, 2020.)

A large number of college students can just solve the problem of human resource demand in the “BRI”. Meanwhile, the“BRI” requires human resources with foreign language skills, communication skills, basic construction skills, communication technology and other skills. Li Guoqiang, an engineer of the First Construction Engineering Co., Ltd. of China Construction Third Bureau, indicated in an interview that the Ministry of Education has strengthened exchanges and learning with foreign countries. During the construction of the “BRI”, they have learned a lot of foreign construction technology and management models, and operated them in China. In other construction projects. It is also mentioned that construction companies also have professional training. In order to cultivate excellent construction talents and be competent for the positions of the “BRI” construction project, they often conduct

professional skills training, conduct exchanges and sharing sessions, and learn the languages, cultures, customs, etc. of the countries along the way. Conducive to the overall development of comprehensive management talents.

A report issued by a Chinese think tank on the 21st pointed out that countries along the “BRI” with active economic exchanges with China are gradually being valued by Chinese students. It is recommended to increase investment in education by the AIIB and set up a “Belt and Road” study abroad fund. In recent years, with the "BRI" and the development of the “AIIB”, Chinese society is facing a transition from “bringing in” to “going out”. Wang Huiyao, director of the China and Globalization Think Tank, said that from the perspective of the development of global multinational companies, local companies still rely mainly on local talents. Therefore, training foreigners who are familiar with and understand Chinese culture has become an important way to cultivate talents. It also requires the study of talent exchange between China and other countries. (Ding ,2015)

Enhancing countries along the “BRI” to study in China and studying abroad is an important carrier for talent training and exchange in the construction of the "BRI". The establishment of "BRI" study abroad fund and increase investment in overseas education can turn into the training center for the construction of the "BRI" strategy.

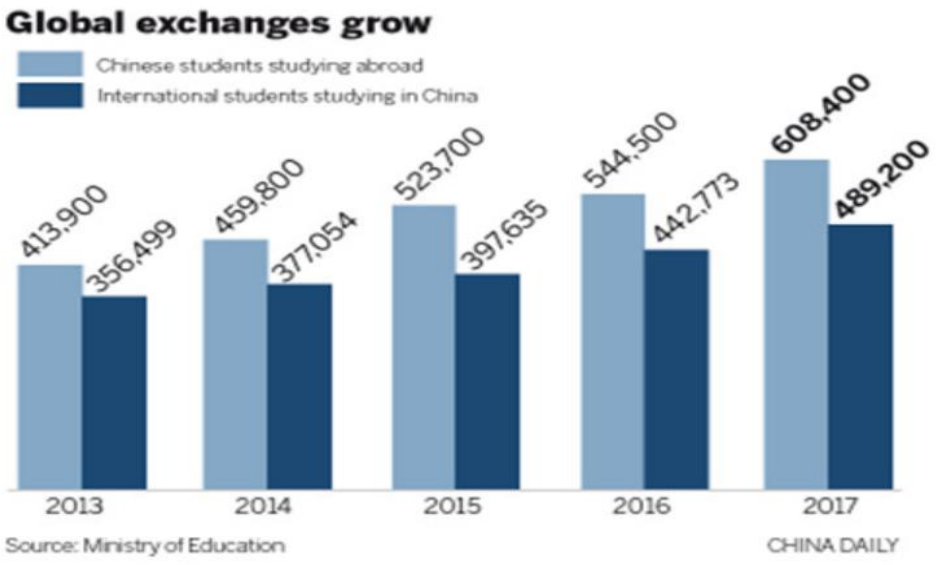

Figure 10. Increasing number of students who study abroad in Belt and Road countries (Zou, 2018).

Infrastructure

China has invested heavily in the construction of roads, railways and ports, as well as in maintaining social development and operation. Since the reform and opening up, China's massive investment and construction in infrastructure have made significant contributions to promoting development and improving the quality of life. As of 2017, China's investment in infrastructure reached 113.68 trillion yuan, and its infrastructure actually ranked first in the world. As of 2018, China's high-speed rail mileage exceeded 29,000 kilometers and highways 142,500 kilometers, coastal ports with berths above 10,000 tons, nearly 1994, and urban subway mileage reached 3882 kilometers, ranking first in the world. China's network system is growing at a rate of 10%, and huge investments are made in Internet infrastructure every year. China's investment in infrastructure such as transportation, internet, water conservancy, public facilities reached 14 trillion yuan, an increase of 19% over 2016, and accounting for 22.2% of the total social fixed asset investment, which is the highest the first of all countries in the world. If we add infrastructure investment in the fields of power, coal, petroleum and other energy sources, the scale of infrastructure investment in the broad sense is about 17 trillion yuan. In 2018, China's overall infrastructure maintained a steady growth trend. (Yang, 2019.)

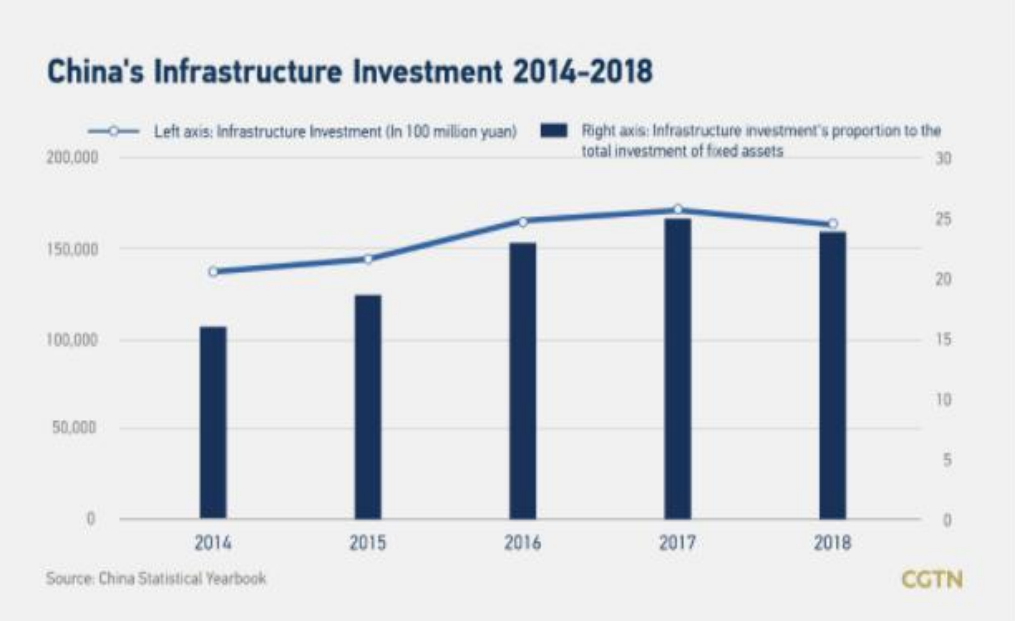

Figure 11. China's Infrastructure Investment 2014-2018 (China Statistical Yearbook,n.d.)

Speeding up railway construction, especially the railway construction in the central and western regions, is a very important measure for steady growth, structural adjustment, and increased effective investment. In recent years, the construction of China's railway transportation has been improved, and the continuous improvement of technical equipment has provided a key foundation for the development of the "CCI".

According to statistics, the national railway investment reached 800 billion yuan in 2016, with 3281 kilometers of newly opened lines. There are 21,000 railway locomotives in the country. (National Railway Administration, 2017.) State Premier Li Keqiang stated in the executive meeting of the State Council that speeding up railway construction in the central and western regions will not only promote the development of industries, but will also help promote the process of new urbanization, improve the development environment in underdeveloped areas, and help local people get rid of poverty life. The meeting pointed out that this year, the national railway is expected to put into operation more than 6,600 kilometers of new lines, more than 1,000 kilometers more than last year, of which nearly 80% of the national investment will be invested in these areas. Meanwhile, further policy

measures for the reform of the railway financing program, raise and implement construction funds have also been determined. (National Railway Administration, 2014.)

China is a big country in infrastructure construction in the world. Not only is it built on a large scale, it has rich experience in construction, and its construction technology is more suitable for developing countries. However, infrastructure in the vast Asian region is seriously inadequate, and the potential demand for infrastructure is large. According to the estimates of the Infrastructure for a Seamless Asia (2017) report, the infrastructure investment needs of 45 Asian countries from 2016 to 2030 are US$26 trillion, with an average annual investment of US$1.7 trillion. Among them, 25 developing economies will require infrastructure investment in 2016-2020. The investment gap accounts for 2.4% of its GDP. In addition, China decided to promote the establishment of the "AIIB" with a capital of 100 billion U.S. dollars. In 2014, it promoted the establishment of a 40 billion U.S. dollar Silk Road Fund. In 2017, it decided to increase its capital. The fund is 100 billion yuan, meanwhile, its purpose is to promote the interconnection of infrastructure in Asia. Under the “BRI”, China has increased its investment in external infrastructure. At present, China has carried out institutionalized cooperation with more than 20 countries. For example, the China-Europe Express train connects Europe, the exchanges between Asia and China, and promotes the exchanges of trade economy and culture. The China-Laos Railway is being opened to traffic, which officially opened the Serbian section of the China-Thailand Railway and the Serbia-Hungarian line, China-Pakistan Economic Corridor cooperation projects, etc. and a number of key project cooperation agreements have been successfully signed. For example, the Turkish high-speed railway, Hungary-Serbia railway and other projects are progressing smoothly. These projects not only strengthened the development of local infrastructure conditions, but also stimulated their trade development. (Foreign Trade Development Bureau of the Ministry of Commerce, 2017.)

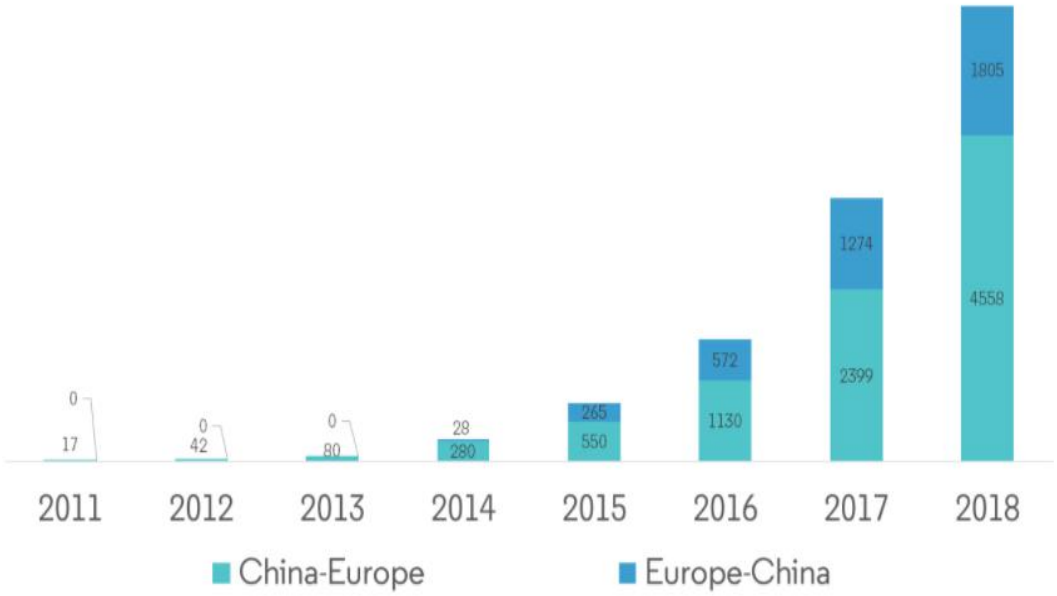

Figure 12. Number Trains Moved Between China and Europe (Mordor Intelligence, 2016)

In 2016, China's non-financial direct investment in countries along the “BRI” was 14.53 billion U.S. dollars, compared with the information in 2015, an increase of 6.3% year-on-year. Although the growth rate dropped significantly, the completed contract turnover exceeded 70 billion U.S. dollars. It accounted for nearly half of the total completed national contract operations during the same cycle. In the short term, the “BRI” infrastructure projects require a large investment, a long construction period, and slow cost recovery. However, in the long run, this is of great significance for improving the quality standards of regional infrastructure interconnection and promoting regional economic integration. (Mordor Intelligence, 2016.)

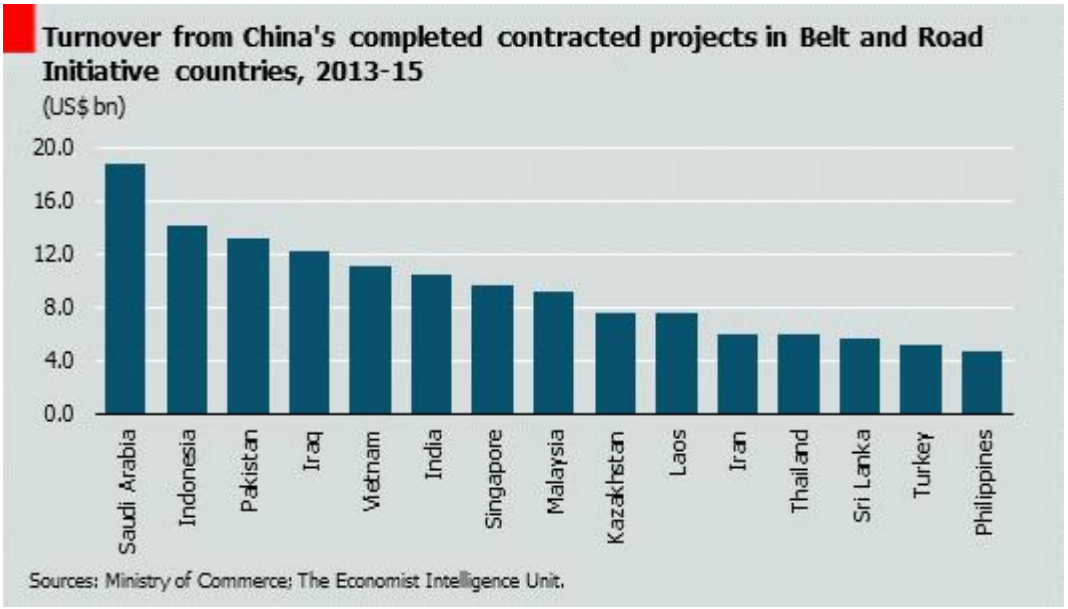

Figure 13. Turnover from China's completed contracted projects in BRI countries 2013-2015 (Ministry of Commerce;The Economist Intelligence Unit.)

Capital Resources

China's development is inseparable from the support of capital resources, such as economy and trade, education, infrastructure, scientific and technological explore , medical technology, and the Internet upgrade, all of which require a large amount of capital investment. By January 2021, China's reserve assets will reach 3,349.305 billion U.S. dollars, of which foreign exchange reserves are 3,210.671 billion U.S. dollars, as shown in the Table 4:

Item	2021.01		2021.02	
	100 million USD	100 million SDR	100 million USD	100 million SDR
Foreign currency reserves	32106.71	22283.92	32049.94	22268.17
IMF reserve position	107.69	74.74	107.52	74.70
SDRs	115.09	79.88	115.00	79.90
Gold	1167.55	810.35	1091.78	758.56
Other resreve assets	-3.99	-2.77	-4.07	-2.83
Total	33493.05	23246.12	33360.18	23178.52

Table 4. Official reserve assets (State Administration of Foreign Exchange, 2021.)

Figure 14 (see below) shows the trends of China National Foreign Exchange Reserves between 2008 to 2020. The decline of reserves after 2014.

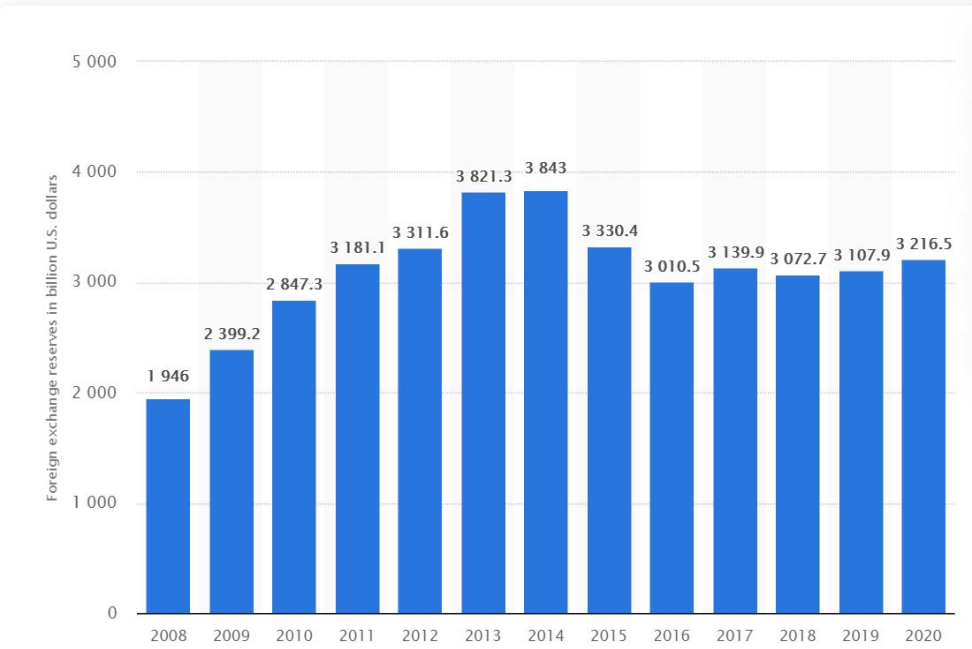

Figure 14. China's foreign exchange reserves from 2008 to 2020 (in billion U.S. dollars).(Statista Research Deoartment, 2021.)

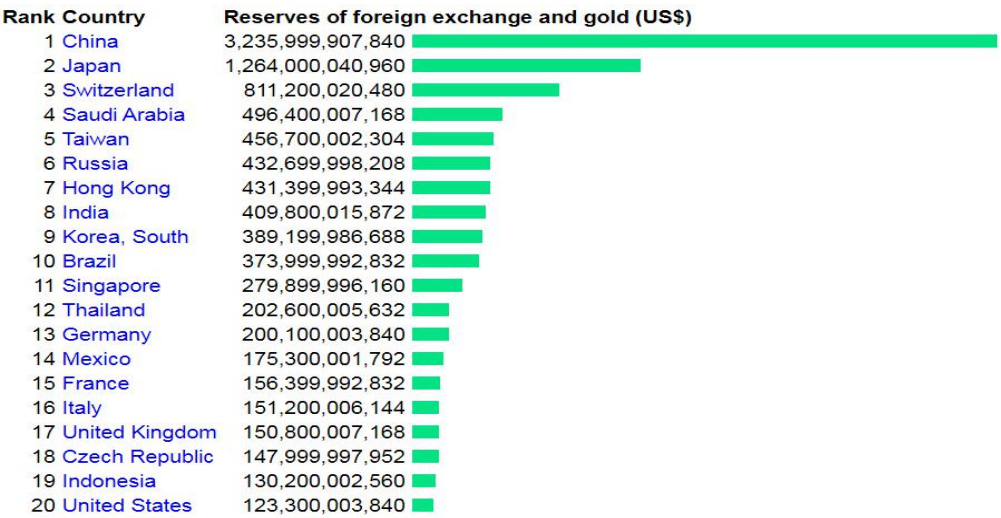

Figure 15. World Top 20 countries of Reserves of Foreign Exchange and Gold (Index mundi ,2020.)

China has been improving the operation and development of the financial system. Since the implementation of the "BRI" , China has fully prepared for "capital" and "knowledge". The Silk Road Fund (SRF) and the “AAIB” are important sources of "capital." In interview, Li Guoqiang, an engineer of the China Construction Third Engineering Bureau, said that the countries along the “BRI” are developing countries. The overall economic level is low. This also means that there will be a shortage of funds and financing around infrastructure construction in the early stages of the strategy. Difficulties and other issues. " "SRF" and "AIIB" are financing partners in the construction of the “BRI”. Funds usually participate in important projects in the form of equity, while banks tend to adopt the debt model. At the same time, both pay back. More funding methods will be generated to obtain more funds for the construction of the "BRI" . (Song ,2017.)

Xi Jinping stated at the “BRI” global Cooperation Summit Forum that China will expand its financial support for the construction of the “BRI” and add 100 billion yuan to the “SRF”. AIIB's role is to bridge the gap between countries. In addition to the "BRI" countries joining the construction of the AIIB, other countries including South America, Africa and other continents also participated in the event. In this way, when the AIIB participates in the “BRI”, its member countries will naturally eliminate all obstacles in their own countries to maximize their own interests and provide corresponding support and assistance to promote the operation of the AIIB in the project. In the future, China may establish new institutions and financial tools to solve the problem of insufficient investment and financing supply capacity of relevant countries in the construction of the "BRI". (Song ,2017.)

In recent years, China's economic trade transactions have remained stable. From Figure 16 (see the figure below), show that China's total exports of goods continue to rise from 2009 to 2019 . This also shows that China is making money, and these funds can be used to support the “BRI”.

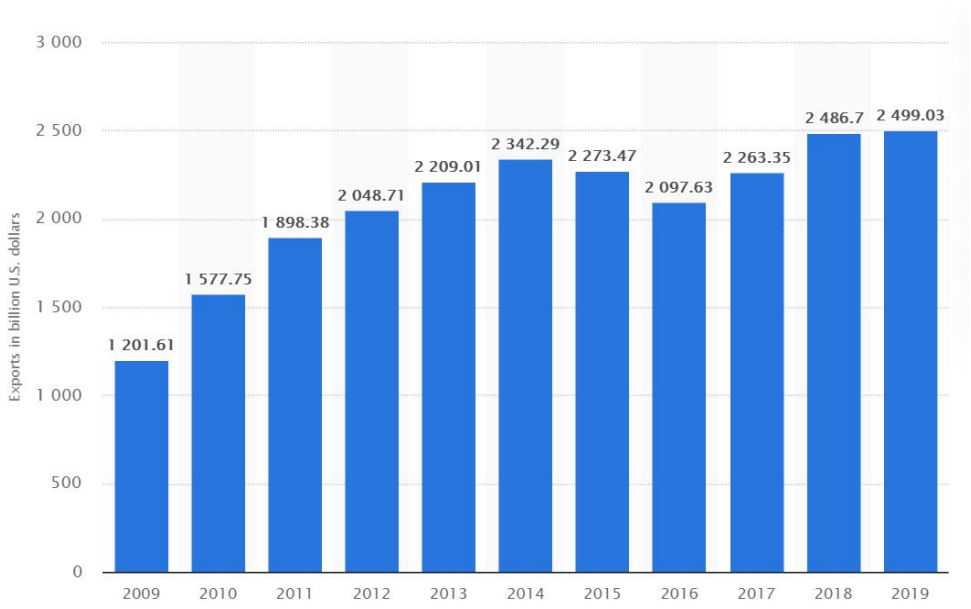

Figure 16. Value of export of goods from China from 2009 to 2019. (Ma, 2020.)

In recent years, China's GDP has been on a growing trend (Figure 17). So we can see our country's reserves, trade surplus and good economic conditions. With the growth of GDP and PPP, China has the capacity to finance its business capital resources.

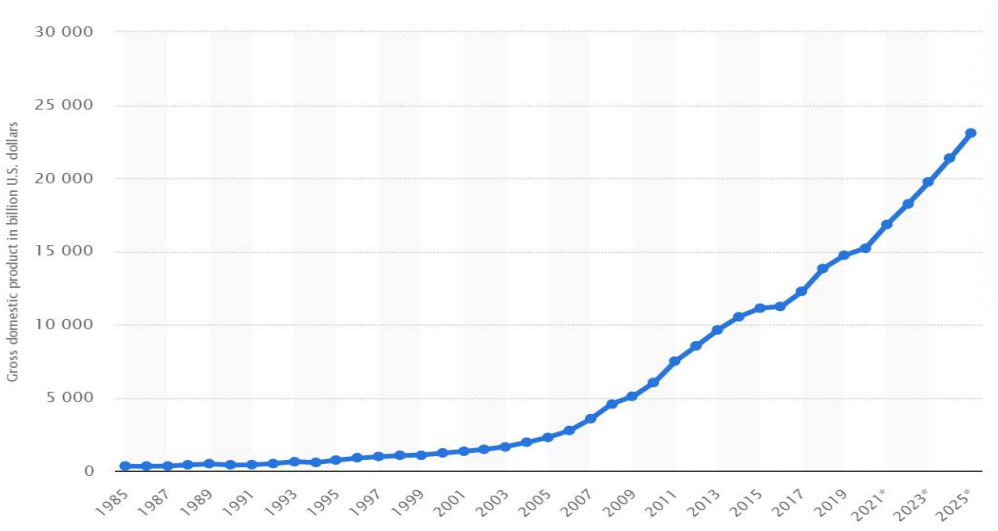

Figure 17. Gross domestic product (GDP) at current prices in China from 1985 to 2019 with forecasts until 2025. (Textor, 2021.)

4.2 Demand conditions

In recent decades, China has made many efforts to develop the economy and build a well-off society. With a population of 1.4 billion, China is a powerful purchasing consumer group and has become an important consumer market in the world. (See Figure 18.) At the same time, domestic demand is the foundation driving force for China's economic , the expansion of domestic demand is to meet the expectations of the people. China has become the second largest consumer market in the world. Consumption has become the first driving force of China's economic growth for many years. In order to expand domestic demand, it is necessary to give full play to the role of consumption, smooth the domestic economic cycle, promote the reproduction cycle, and promote the operation of high-quality trade projects. (XinHuaNet ,2020.)

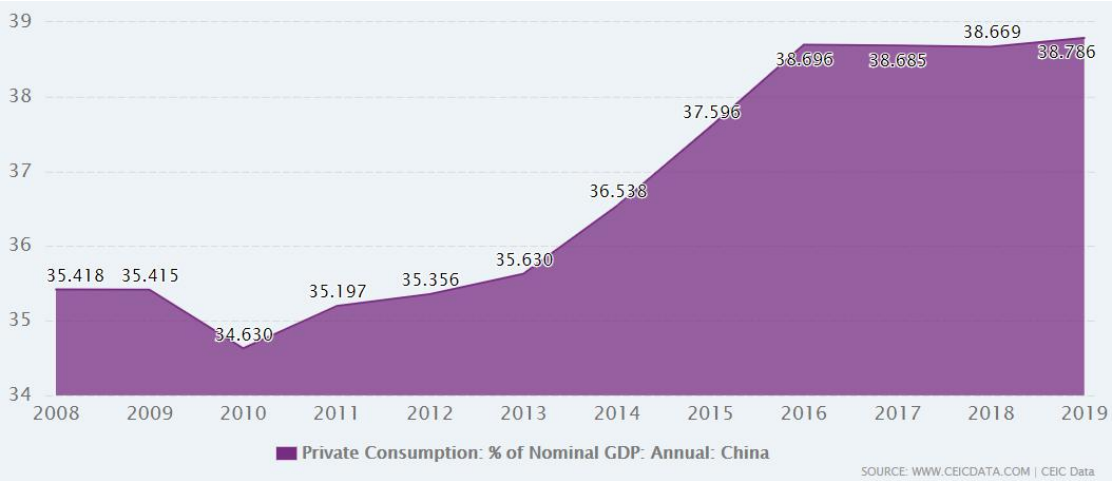

Figure 18. China Private Consumtion:% of GDP (CEIC Data, 2019.)

Figure 18 shown that China private consumption as a percentage of GDP is on the rise between 2008 and 2019, which can be known that China's consumption power is constantly improving , meanwhile, domestic demand is also constantly expanding.

China's urbanization is constantly improving. According to statistics, the urbanization rate in 2010 was 50%, and the urbanization rate in 2019 was about 60%. In 10 years, the urbanization rate will be increased by about 10%, which shows how difficult it is

to achieve this result. (XinHua, 2020.) The infrastructure of the city is the foundation of its normal operation. It can help improve the quality of the living environment, improve the efficiency of urban operations, and promote the development of urbanization. The rapid development of cities requires the construction of infrastructure and public service systems, which generate huge demand for transportation, housing, network systems, and public services. (XinHua, 2020.) The potential of the Chinese market is enormous. Therefore, further urbanization of China will certainly stimulate the growth of China's economy.

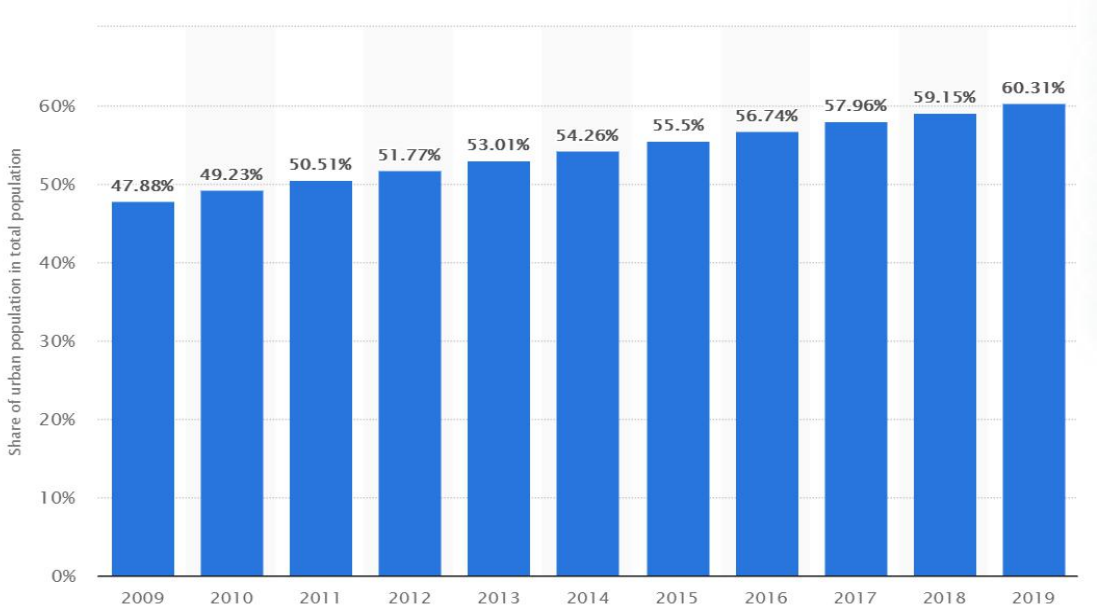

Figure19. China:Urbanization 2009-2019.(Statista ,2020.)

Figure 19 show that China's urbanization has been on the rise between 2009 and 2019. Chinese cities are constantly developing, which also shows that behind the rapid development of infrastructure are huge market demands.

Xi Jinping pointed out: "Trade is the key engine of economic growth." As one of the "five links" pointed out by the "BRI" , barrier-free trade is a key ingredient to promote the construction of the "BRI". From 2014 to 2016, the trade plan between countries along the route is approximately RMB 20 trillion, a growth rate higher than the global average. Among them, the foreign direct investment of companys from countries along the “BRI” exceeded US$50 billion; the value of newly signed foreign

contracted projects by countries along the route was US$304.9 billion. "Chinese products and services" have attracted investment from countries along the “BRI”, and more products, services, technologies and capital from countries along the “BRI” have also continued to enter China.(Zong, 2017.)

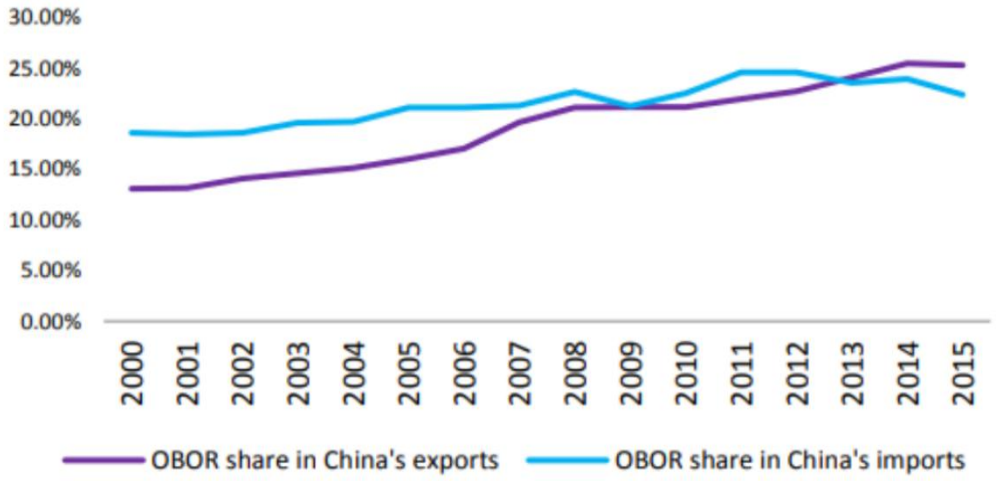

Figure 20. The Export and Import share of BRI in China (Garcia-Herrero & Xu, 2018)

The increase in import and export quota will inevitably increase the demand for logistics and transportation. With the cross-border development of China's e-commerce, the demand for logistics and transportation services has also been accelerated. To protect the rights and interests of consumers, China revised the Consumer Rights Protection Law . Make Internet shopping have certain rules, enhance consumer confidence, strengthen consumers' awareness of legal and promote the growth of domestic demand.

“Reform and opening up” opened the door to China, and strengthened economic and trade cooperation, cultural exchanges, and investment development with other countries. However, due to natural conditions, historical evolution, policy trends and other factors, this opening is unbalanced in regional space. The eastern coastal areas have a high quality of economic development, meanwhile, have a great degree of capital and technology concentration. Due to a late start, the overall development of the central and western regions is worse than that of the eastern regions. Especially

in the western region, the infrastructure is backward, the border areas and neighboring countries are not connected or unblocked, and the traffic conditions have become a stumbling block to development. The“BRI” can help reverse the problem of uneven development in China's region. The first thing that the "BRI" must achieve is "facility connectivity." The construction of the six economic corridors will open up a fast lane for open development in the western regions, and the operation of the China-Europe Express will also boost the economic take-off of the western regions. The “BRI” emphasizes both maritime cooperation and land connectivity. It not only encourages cooperation with developed countries , but also actively promotes opening up to developing countries. By opening to the west, connecting the Asia-European-European Road and promoting the balanced development of opening to the east and opening to the west, the formation of internal and external linkages, land-sea coordination, and the development of trade between China and East Asia, Europe and Russia have been promoted. (Gu, 2017.)

Figure 21(see below) show the amount of China’s overseas contracted projects from 2012-2018. The amount of money represents overseas demand.

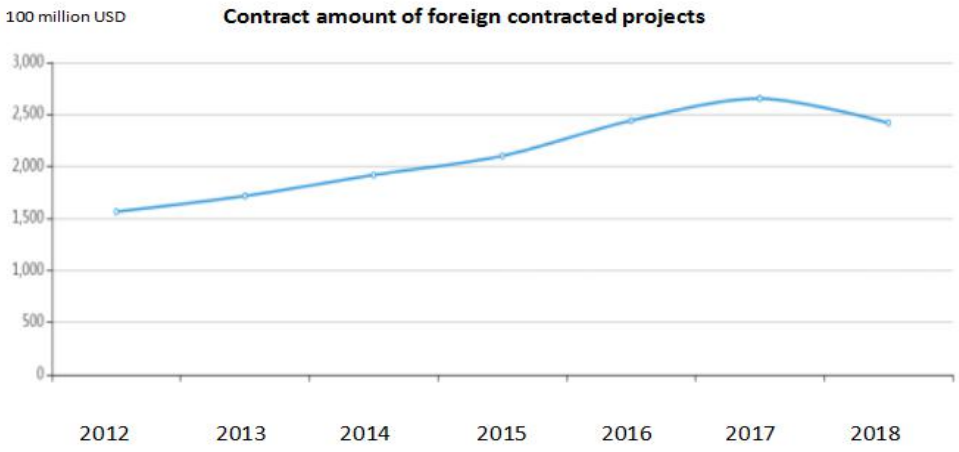

Figure 21. Contract amount of overseas contracted projects (National Bureau of Statistics, 2019.)

The “BRI” has increased international demand, and consumers are more concerned about the safety and quality of products and services. The government is striving to

strictly supervise and manage product quality and safety and establish a quality credit system. Infrastructure construction plays an important role in the “BRI”, for example, railways, ports, and gas channels. Related to the procurement of construction materials, relevant standards and regulations have been established. And for companies bidding for contracts, the focus is to open up government procurement in the region. The "Government Procurement Law" and the "Tendering Law" were formulated to assist activities related to Chinese projects, related goods and services.(Qiao & Chen, 2018.)

The “WTO” stated in its "2016 China Trade Policy Review" that China mainly adopts public bidding, and its procurement has become more thorough. At the same time, a lot of relevant information is public. (European Union, 2017.)

China has signed more than 130 bilateral and regional transport agreements involving railways, highways, water transport, civil aviation, and postal services with countries along the “BRI”; 356 international roads and land-sea combined transportation of passenger and cargo have been opened through 73 highway and water ports. Transportation routes; 11 cross-border railways have been built; "China-Europe Express" routes have reached 29 cities in 11 European countries, and international railway transportation and postal services have begun to gain international logistics brand influence. Infrastructure construction not only activates the development of trade, but also generates huge demand.(Ren, 2017.)

When meeting these needs, the process of implementing the “BRI” needs to protect the balance of the ecological environment of the countries along the “BRI”. In order to balance the ecological environment, China actively cooperates with countries along the "BRI" to promote environmental standards, technology and cooperation, and strengthen ecological and environmental services. In order to strengthen cooperation in ecological environmental protection, provide ecological environmental protection services, support and ensure the development of the "BRI" construction to an environment-friendly route. The Ministry of Environmental Protection has also formulated the “BRI” ecological environment cooperation plan

and the “Belt and Road Construction” guidelines. (Ministry Of Ecology And Environment The People’s Republic Of China, 2017.)

4.3 Related and supporting industries

Infrastructure construction is a key part of the "BRI" . The construction of these infrastructure railways, highways, ports, energy channels, information systems, etc. Will connect the previously remote and poor countries of the world and the economically underdeveloped developing countries with the global economy. Li Chao mentioned in the interview that most of the countries along the “BRI” are mainly developing countries, and the related transportation infrastructure is relatively backward. The implementation of these infrastructures requires a lot of funds. In order to support this huge project, public financial institutions controlled by the Chinese government have invested funds so that related construction companies can cheaply lend to companies engaged in the “BRI”. Meanwhile, Chinese state-owned companys can provide competitive bidding for projects of foreign companies.(Stephen, Pudner & Gregory, 2019.) In addition, the AIIB is committed to improving infrastructure construction and interconnection among Asian countries, and is actively establishing a cooperative financing relationship with the "BRI" . (Zhao ,2020.) With the continuous advancement of the "BRI" construction, trade with relevant countries and regions continues to grow, and the demand for logistics business is also increasing, which offers a rare opportunity for logistics development. The "BRI" transition to Asia, Europe and Africa has broad trade prospects. The traditional trade mode is transformed and upgraded. The trend of small batches and multiple growth is gradually increasing. (Ji, 2018.)

The logistics center built under the “BRI” and its radiation model make regular delivery more assured, reduce inventory levels and storage costs in large warehouses, and combine air, ship, rail, and highway intermodal container freight combinations have become possible. In order to help the construction of the "BRI", China Post Express Company has also strengthened the construction of international air transportation capacity. In addition, with the help of high-level information

technology, JD Logistics has created a "smart brain" information system that can realize fast, accurate and real-time management of the flow of cross-border e-commerce products. Meanwhile, the "Outline Development Plan for the Guangdong-Hong Kong-Macao Greater Bay Area" proposes that the Guangdong-Hong Kong-Macao Greater Bay Area should become an important support for the “BRI” construction. (Chen, 2019.) Therefore, the logistics industry is a key part of the construction and development of the “BRI”.

China's overcapacity, most of which belongs to traditional industries. Are required for investment in infrastructure and industrial development of the "BRI" countries. The proposal of the “ BRI” provides a market, space and opportunities for the upgrading of Chinese industrial clusters in the global value chain. After years of development, China has a large number of advantageous industrial clusters, generally through the expansion of countries and regions along the “BRI” or cooperation with industrial clusters. This brings economies of scale to our advantageous industrial clusters, enhances industrial competitiveness, and seizes a larger market share to attract more overseas investment.(Qiu, 2016.)

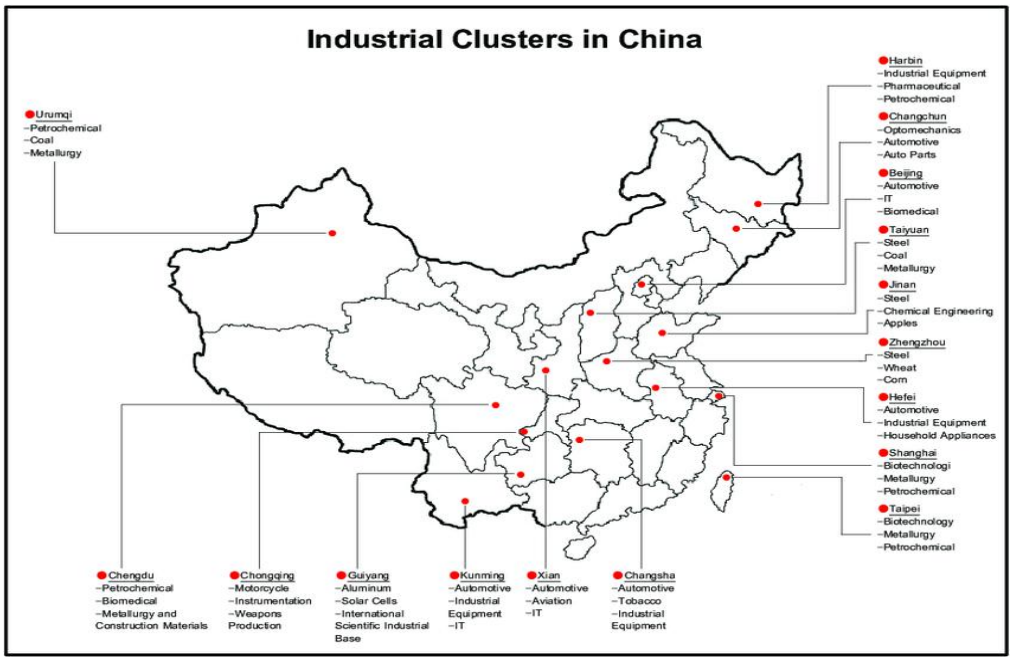

Figure 22. Industrial Clusters in the People's Republic of China (Clemente Hernandez, 2012.)

Under the "point-and-axis drive" development concept, more than 20 key industrial parks will be built along various economic corridors. Such as "Khorgos Economic Development Zone", "Kazakhstan Astana-New City Special Economic Zone"; located in the China-Russia-Mongolia Economic Corridor are "Manzhouli, Erenhot and Suifenhe (Dongning), Jilin Yanji (Changbai) key points "Development Experimental Zone"; those located in the China-Singapore (Indochina Peninsula) Economic Corridor include ", "Indonesia-China Comprehensive Park", "Singapore Jurong Industrial Park", etc. (Qiu, 2016.)

Figure 23. China's Overseas Special Economic Zones&Industrial Parks(Cyrill, 2020.)

In the implementation of the “BRI” , education likes a key part in the “BRI” , such as building basic skills, language and culture. In 2017, the Ministry of Education announced the “Belt and Road Education Action Plan”. The Confucius Institute in China was established in 2004 and is the main government tool for the development and dissemination of Chinese language and culture internationally. In recent years, Chinese infrastructure construction companies have spread all over the world, and it is crucial to formulate China's construction and technical standards. Enable local

construction workers to understand Chinese technology and standards. (The British Chamber of Commerce in China, 2019.) Engineer Li Guoqiang mentioned in the interview that universities, construction sites, and construction companies have established basic construction skills training institutions, and the research center has also set up research and design of construction equipment.

The new model of "Internet+" also provides new impetus for the rapid development of the "BRI" construction and the economic growth of related countries. The wireless base stations of China's Huawei Technologies Co., Ltd. are deployed in more than 50 countries/regions. And the rapid entry of cross-border e-commerce and mobile payment into countries along the “BRI” has affected the consumption habits and methods of local residents. Infrastructure interconnection is a key area of the "BRI" construction. Only by strengthening the construction of Internet information infrastructure and paving the way for the smooth flow of information can we truly stimulate the economic vitality of the “BRI” .(Wang, 2018.)

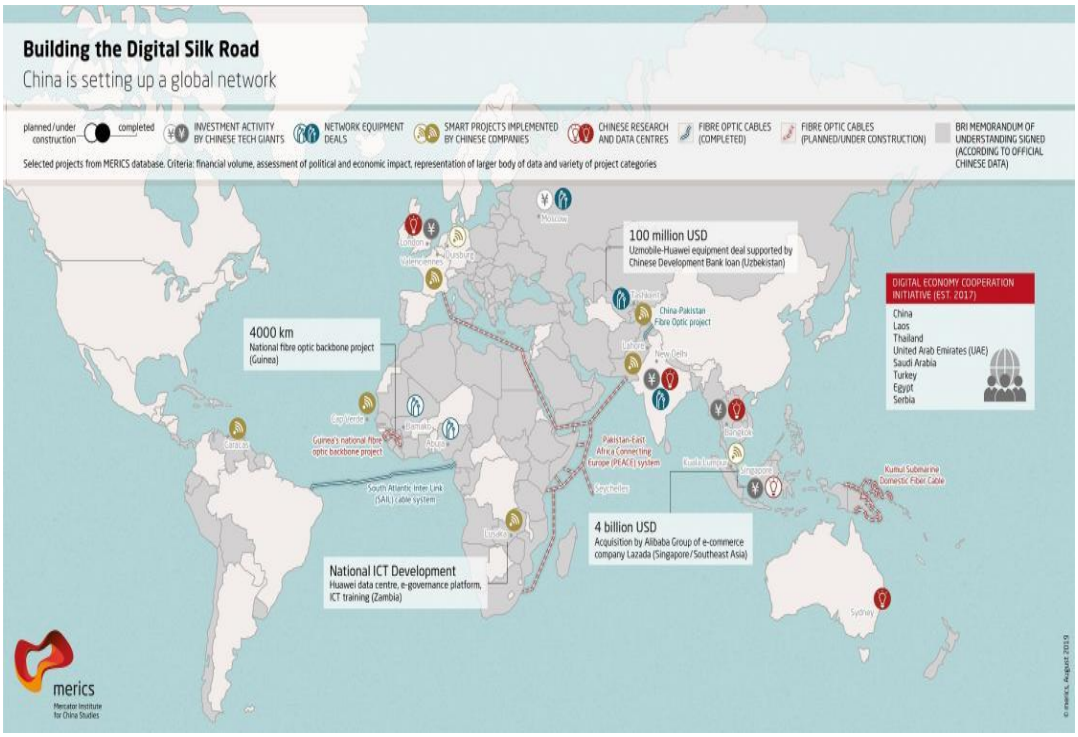

Figure 24. Networking the “Belt and Road”.(Mercator Institute for China Studies, 2019.)

Figure 24 shows the network that China has built around the world to build a digital silk road. It also shows that the network plays an important section in the construction of the “BRI”.

The analysis of the global construction industry indicators (GCII) concludes that “CCI” is attractive and has a greater influence on economic development. However, compared with some developed countries, the “CCI” is still a labor-intensive industry, with insufficient international competitiveness and imperfect construction industry regulations. Chen Huayuan, chairman of the China Construction Third Engineering Bureau Co., Ltd., said that the current 10% tax rate for transportation and construction industries will be decreased to 9%, and relevant regulations will be revised . Moreover, This offers a new chance for the growth of the construction industry and further enhances the international competitiveness of China's construction industry.(Chen, 2019.)

4.4 Context for firm strategy and rivalry

The implementation of China's "BRI" has improved the economic growth of China and countries along the “BRI”. It also promoted the development of the construction industry, opened up new markets, and provided chances for Chinese companies to develop overseas and attract overseas investment. The “BRI” has also enhanced the competitiveness of Chinese companies. However, while competing with overseas companies, it has also promoted the development of Chinese companies.

Taking the construction industry as the main business, taking China State Construction Corporation Limited (China State Construction Group) as an example, implement the “five in one” overall layout and the “four comprehensive” strategic layout, and implement new development concepts. Strive to build a world-class enterprise and strive to become the world's first brand in the field of investment and construction. (China National Construction, 2017.) China Railway Group Corporation (China Railway Group) is also an example. It mainly focuses on infrastructure and takes innovation and development as its key strategy. China Railway Group has a

long-standing reputation in the global market. (Yang, 2019.) Take Huawei and Xiaomi as examples. They both focus on the production of electronic products and actively promote development through innovation. Another example is Alibaba, which is establishing a competitive relationship with Amazon.com. However, Alibaba is reforming its business model to provide comprehensive international services. (Kynge, 2019.)

On the other hand, the implementation of the "BRI" can be regarded as a strategic opportunity for the “CCI” to compete with overseas construction companies. During the process of infrastructure construction on the “BRI”, we will use advanced construction technology and machinery, follow the local cultural laws of the countries along the route, and follow the standards of the construction industry. The Chinese government and construction companies have made a lot of efforts in this process to help the transnational development of the “CCI” "going out", while also driving local development, driving the employment and living standards of countries along the “BRI”, meanwhile, promoting the local investment environment Healthy progress.(Chen, 2017.)

Some obstacles have also been encountered in the construction of the “BRI”. Due to the complex religions and ethnic contradictions involved in the countries along the route, moreover, the degree of openness, rule of law and marketization of countries along the “BRI” are quite different. Administrative law enforcement and administrative supervision in some countries are very complex, and enforcement efficiency is not high. There are some differences in the enforcement of foreign trade companies. Discrimination may even be based on domestic politics, economic interests, and security considerations. The existence of these factors will adversely affect and risk the overseas projects and project activities of the “CCI”.（Li &Wang, 2017.）The goals of China and the countries along the "BRI" are not exactly the same. Therefore, the laws of some countries impose some special requirements on foreign investors, out of consideration of anti-monopoly and maintaining effective competition. In addition, because cross-border mergers and acquisitions may lead to monopoly, this may disrupt the market order in the country and surrounding areas,

and even suppress related industries in the country and surrounding areas, it may also encounter the risk of anti-monopoly review by the country and related agencies. Moreover, cross-border mergers and acquisitions may also face the target company's anti-merger risks, the legality risk of the merger process, and the target company's concealment of its own guarantees, litigation disputes, and other issues. The legal deadlock caused by symmetry. On the other hand, the investment and trade process in the “BRI” construction will result in the protection of intellectual property rights. If all parties involved in foreign investment and trade do not adequately protect intellectual property rights and fail to take appropriate measures, it may cause intellectual property disputes and other issues.(Li &Wang, 2017.)

The number of countries along the “BRI” has reached 65, the construction route is very long and road obstacles will inevitably be encountered. The Land Silk Road has three main roads, north, middle and south, which pass through mountains, Gobi deserts and rivers, so there will be problems such as cargo safety.(He, 2015.)

4.5 Government

The “BRI” is one of President Xi Jinping’s most ambitious overseas and economic projects. The Chinese government wants to strengthen China's development through a huge infrastructure construction plan in China's surrounding areas, and improved the economic and infrastructure development of the countries along the route. (Cai ,2017.) Infrastructure construction is a key part of the implementation of the “BRI”. When it comes to the “CCI”, the Chinese government has presented a series of strategic guidelines to promote the development of the construction industry. The “CCI” began to start a new stage of development in 2014. Premier Li Keqiang stated in his 2015 government work report that the investment within the central budget enhanced to 477.6 billion yuan, railway investment was more than 800 billion yuan, and the newly commissioned mileage was more than 8,000 kilometers. In addition, funding is also a key factor in the implementation of the “BRI” project. The Chinese government proposed at the APEC meeting to invest 40 billion US dollars to establish

the “SRF” to enhance the construction of the Asian Basic Investment Bank (ABIB).(Chen, 2017.)

The construction of the “BRI” project has also promoted the development of the western region , in addition, has improved established a land-based economic corridor for Central Asia. Under the promotion of the government, Premier Li Keqiang of the State Council reviewed and passed the "Thirteenth Five-Year Plan for the Development of the Western Region" at the meeting. And made arrangements to further improved the development of the western region. Li Keqiang mentioned that it is necessary to improve relevant policies to guide the industries that do not pollute the environment and attract more jobs in the eastern and central regions to shift to the western region, and encourage the manufacturing industries in the eastern regions to invest in the western border regions. In addition, Li Keqiang also mentioned that the development of the western region needs to strengthen the protection of infrastructure and ecological and environmental protection to enhance the supporting capacity for recyclable development. Carry out the construction of major water diversion, large-scale irrigation areas and "five small water conservancy projects", and implement the consolidation and improvement of rural drinking water safety. In addition, focusing on the overall situation of the national ecological security barrier, it will improve the green development mechanism, strengthen the natural ecosystem and environmental protection, continue to implement major ecological projects such as returning farmland to forests and grasslands, and soil erosion control, protect forests and grasslands, and improve ecological compensation mechanisms. , Resolutely hold the ecological red line. Li Keqiang emphasized that relevant departments in all regions should continue to increase support for the western region in terms of counterpart assistance, fiscal and taxation, project layout, and financing services to help the development of the western region.(Wang, 2016.)

Ecological environmental protection is a key part of the "BRI" construction. Under the promotion of the government, the Chinese environmental protection department has issued the " BRI" Ecological Environmental Protection Cooperation Plan on protecting the ecological environment. Eco-environmental protection

cooperation is the fundamental requirement of the green "BRI" construction, an important way to realize the green transformation of the regional economy, and an important measure to implement the 2030 Agenda for Sustainable Development. By 2030, comprehensively improve the level of cooperation in ecological and environmental protection, and further expand cooperation in areas such as the suppression of environmental pollution and technological innovation in the protection of the ecological environment. In order to achieve the green "BRI" construction goal. Construction will benefit countries along the “BRI”, ecological and environmental protection projects will be comprehensively improved, and guarantee and guarantee capabilities will make the construction of the "BRI" a green, prosperous and friendly road. (Liu, 2017.)

5. Discussion

5.1 Answer to the research question

The purpose of this research is to explore the impact of the implementation of the “BRI”. The question of this research is what is the effect of the “BRI” on the competitiveness of the “CCI”? The answer from the research is collected according to the four factors of the Porter Diamond Model, as presented below.

Studies have shown that after the implementation of the “BRI” , considerable progress has been made in infrastructure construction. China has signed agreements involving railways, highways, waterway transportation, civil aviation and other fields with countries along the “BRI”. 356 international transportation routes were opened; 11 cross-border railways were built. A three-dimensional transportation network of sea, land and air between China and the countries along the "BRI" is taking shape. (Ren, 2017.) China has invested a lot of money in infrastructure construction, especially in the western region. In recent years, the Sichuan-Tibet Railway, Xicheng Expressway and Lanzhou-Xinjiang railway have been put into operation. Due to the large amount of projects, the countries along the “BRI” are developing countries, and their economies are not so good. Funding for construction is a problem. The AIIB, the

SRF, the China Development Bank, the Export-Import Bank of China, and some financial institutions will provide special loans and financing services to support the “BRI” infrastructure construction and production capacity. Financial cooperation. (An, 2017.) In addition, it has attracted many Chinese companies to invest in foreign infrastructure projects. China has cooperated with many countries in infrastructure projects, such as the China-Europe Express, the internal section of the China-Russia East Route Natural Gas Pipeline, the China-Pakistan Economic Corridor, the second-line China-Russia crude oil pipeline project, the Turkish high-speed rail, the Hungary-Serbia railway and other construction projects. (12335 China Foreign Economic and Trade Enterprise Service Network, 2017.) China has also built more than 20 key industrial parks in countries along the route. Such as "Khorgos Economic Development Zone", "Kazakhstan Astana-New Urban Special Economic Zone", "Erenhot and Sufenhe (Dongning) Industrial Parks." (Qiu, 2017.) These major projects are indispensable. The support of infrastructure construction also presents that the “BRI” has improved China's competitiveness in infrastructure construction.

The second major finding is that the construction needs of China's supply chain are becoming more and more important in the “BRI”. With the improvement of infrastructure in the “BRI”, the supply of building materials and trade exchanges will inevitably form a complete supply chain through the construction of ports, pipelines, aviation, and railways. Moreover, the proposal of the "BRI" strategy provides a market, space and opportunities for the upgrading of Chinese industrial clusters in the global value chain. After years of development, through the establishment of industrial cluster cooperation in countries along the “BRI”, China has formed numerous advantageous industrial clusters, thereby enhancing the competitiveness of these advantageous industries in China.

Under the Chinese government, the “BRI” construction has provided employment opportunities for countries along the “BRI” and solved the problem of funding for their construction. It also helped the countries along the route build railways, ports, highways, pipelines and communication systems, so as to achieve the goal of interconnection and joint construction between countries, and improve the construction and growth of China and joining countries.

5.2 Practical / managerial implications

Studies have shown the “BRI” has linked China with countries along the route. Through infrastructure construction, two direct routes from sea and land to Europe have been formed, which has improved the development of China’s infrastructure and construction industry , in addition, improved the competitiveness of the construction industry. Promote the construction and economic growth of countries along the route, speed up logistics from China to Europe, reduce circulation costs, and further enhance China's competitiveness.

The results of this research have important significance and influence on future research and development. As there is currently no official database for the “BRI”, it is also unclear about the specific investment scope of the “BRI”, let alone the specific amount of infrastructure construction in the “BRI”. It is important to establish an official the “BRI” database that everyone can access. This can allow more people to understand the “BRI”, build trust in the “BRI”, attract more investment from companies and people, and strengthen the development of the “CCI” technology has enhanced the competitiveness of infrastructure. In a word, infrastructure (construction industry) is a rigid demand from all countries in the world.

Secondly, the “BRI” project as an ambitious strategy. Many foreign media will over-understand that this is a means for China to seek benefits and strive for the world's number one position. It is key for foreign governments and foreign enterprises to China's infrastructure (construction industry). His abilities and technology hold a skeptical and distrustful attitude. Therefore, it is very meaningful and important to explore and study the “BRI” projects and their impact on the development of infrastructure.

5.3 Assessment of the results in the light of literature

Similar to this study is a previous study done by Michael Porter (Porter, 1990), which pointed out that internal demand plays a key role in increasing the competitiveness

of the industry. (190-191) The domestic market clearly shows their needs. At the same time, foreign markets also need this kind of demand. This research confirms the demand situation of the Porter Diamond Model. The research also found that the implementation of the “BRI” has created domestic industry demand and also increased foreign demand for Chinese industries and services.

The Chinese government does not participate in the process of building competitiveness, but the government has launched many policies to support the infrastructure (construction industry) of the “BRI”, such as the “AIIB”, the “SRF”, the Export-Import Bank of China, and the “CDB”. The financing of the Yi Road project and loan services are all supported by the government. In addition, many private companies have also invested in the infrastructure of the “BRI”. Infrastructure (construction industry) is the rigid demand of various countries. Through the construction of infrastructure and the provision of financial support, the “BRI” has provided China with a new market, especially the construction industry. Makes the international demand for China's infrastructure. Porter also pointed out that the creation of these opportunity platforms is conducive to consolidating the market for related industries in China. (Porter, 1993, 83.)

The four determinants in the Porter Diamond Model are used to evaluate the quality of the civil business environment. The study found that the political relationship between the country and the country has a quality influence on the development of the industry. The good cooperative relations between countries provide many opportunities for the construction and development of the country. Especially for neighboring countries, good construction cooperation can be Realize interconnection, promote the development of infrastructure, meanwhile, improve the circulation of goods and cultural exchanges.

5.4 Limitations of the research

This research has certain limitations. For example, there are restrictions on accessing the original imformation on the “BRI” project and its infrastructure (construction

industry), and secondly, there are also permission issues in reading related documents. Then the interviewees do not work in the “BRI” project, resulting in the collection of data. There are limitations. The most important limitation is that the “BRI” project is still being implemented, and many data are unstable and uncertain.

As a result, it is difficult to assess the impact of the construction of the “BRI”. At present, about 70 countries joining in the “BRI” projects. Many new construction projects and cooperative investment projects are constantly being produced, and various new policies are also being produced. It is hard to assess the whole impact of it in detail. Regarding internal effectiveness, we carefully selected and implemented research strategies, information collection and analysis ways. The main information for the interview comes from engineers from China's state-owned enterprise "China Construction Third Bureau First Construction Engineering Co., Ltd." and "industrial equipment" engineers.

Regarding reliability, the data used are mainly collected from official government websites, reports issued by authoritative organizations, and authoritative documents. The interpretation is based on the information in the data and reports. Therefore, it is more trustworthy.

5.5 Recommendations for future research

Since the "BRI" is a long-term project, about 7 years from its launch, it is impossible to evaluate its results in detail at this time. But in fact, China's infrastructure has gained a lot of room for development and its influence has been increased, and China's economy has also improved a lot. Obviously, the quality of life in China has been improved, such as infrastructure construction such as extensive railways, highways, ports, and full coverage network systems. The “BRI” project not only enhances economic strength, but also improves the competitiveness of the “CCI” and drives the construction and development of countries along the “BRI”.

The “BRI” also faces some risks and challenges. For example, the overall risk level of the countries along the route is relatively high, and geopolitical conflicts are obvious. In addition, the overseas legal environment restricts the implementation of the “BRI” project and other challenges. These have made it difficult to implement the infrastructure of the “BRI”, and the construction efficiency is low.

The “BRI” was proposed by Xi Jinping and was likened to an ambitious strategy to present that China will turn into a super country. The result of the “BRI” may have a significant affect on the infrastructure (construction industry) and the future of economic and trade in Asia. Will China's "BRI" succeed?

In summary, many important issues remain to be resolved. For example, there is no accessible information database on the “BRI” and its infrastructure (construction industry). Information related to the development of the “BRI” project must be collected from different sources. In addition to the focus of this research, it is also important to study the “BRI” from other perspectives. For example, what risks and challenges must be overcome in order for the “BRI” project to succeed? For example, huge capital investment lacks policies and channels to enter the infrastructure. Faced with the problem of uneven regional development of infrastructure, how should the “BRI” be implemented? Further research on this issue will help to find more evidence that the “BRI” can help improve the competitiveness of China’s construction industry.

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Appendices

Appendix 1. Interview Questions

1. How will the "Belt and Road" project help improve China's human resource building skills (for example, university construction industry engineering training)?

2. How will the “Belt and Road” project affect the use of natural resources (for example, oil and natural gas) by the Chinese construction industry?

3. How will the “Belt and Road” project improve the quality of knowledge resources in China's construction industry (such as scientific research institutions)?

4. How will the ``Belt and Road'' project affect the capital resource utilization of China's construction industry (for example, the amount and cost of capital available for financing business)?

5. How does the "One Belt One Road" project affect China's infrastructure construction?

6. How will the “Belt and Road” project improve the transportation and energy structure in China and along the route? (Required conditions)

7.How will the “Belt and Road” project affect the development of the construction industry in China and participating countries? (Requirements)

8. How will the “Belt and Road” project affect the development of trade cooperation between China and participating countries?

9. How will the “Belt and Road” project affect the cross-border cooperation of China's construction industry?

10. How does the “Belt and Road” project promote the innovation of basic construction technology?

11. How does the “Belt and Road” project coordinate with the management policies of participating countries?