

# Research on the Path of Digital Economy Cooperation between China and Portugal

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**Abstract:** *The digital economy has become an emerging economic growth point in the development of countries in the world today, and how to carry out international cooperation between digital economies has become a common topic. This article analyzes the path of digital economy cooperation between China and Portugal, and concludes that China and Portugal have a solid foundation for cooperation, have complementary advantages in digital economy infrastructure and technological innovation, and have continued to communicate effectively through Macao in recent years, but it still faces threats brought about by changes in the international situation and differences in policies and regulations between the two sides. In order to promote the stable development of the digital economy of bilateral countries, the following cooperation paths are proposed: bilateral countries should ensure the stable development of cooperative relations, strengthen cooperation in infrastructure construction and technological innovation, and promote innovation in talent training models.*

**Keywords:** *China, Portugal, Digital economy cooperation*

## 1. Introduction

The development and cooperation of digital economy has become one of the hot topics in the world. Especially in the period of global economic recovery after the COVID-19 epidemic, the digital economy has been regarded as a new economic form with its unique non-contact and convenience by many countries. At present, with the continuous development of digital technology, digital concepts such as big data analysis and artificial intelligence have developed rapidly. According to the White Paper on Global Digital Economy released by the China Academy of Information and Communications Technology in 2022, the digital economy of 47 major economies in the world will reach \$38.1 trillion in 2021. However, due to the current changes in the international situation, in order to seek long-term development, countries need to work with partners to build a basic framework for the development of the digital economy.

As a comprehensive strategic cooperative partner of China, Portugal signed the Memorandum of Understanding on the Belt and Road Initiative and the Memorandum of Understanding on Jointly Promoting the construction of the Silk Road Economic Belt and the 21st Century Maritime Silk Road respectively in 2018. In recent years, there have been more economic and cultural exchanges with China and bilateral relations are relatively stable. At the same time, however, due to changes in the international situation, there are certain potential threats to bilateral cooperation. Therefore, this paper discusses the basis of bilateral cooperation between China and Portugal, the development status of Portugal's digital economy, the threat of bilateral cooperation and other aspects, so as to draw up a cooperation path for stable cooperation between the two countries and jointly promote the development of digital economy.

## 2. The Basis for Digital Economic Cooperation between China and Portugal

As the second largest digital economy in the world, China has achieved certain results in the development of the digital economy in recent years. Since the signing of the "G20 Digital Economy Development and Planning" in 2017, China has taken the development of the digital economy as a new development direction<sup>[1]</sup>. In the "14th Five-Year" Digital Economy Development Plan in 2021, the strategic goal of comprehensively expanding the digital economy, using the digital economy to drive other economic transformations, and driving the stable development of the overall economy is proposed. In 2023, the "Overall Layout Plan for the Construction of Digital China" clearly proposed to build and

expand the international cooperation pattern and space in the field of digital economy. In terms of development effectiveness, according to the "White Paper on the Development of China's Digital Economy" issued by the China Academy of Information and Communications Technology in 2022, the overall scale of China's digital economy has reached 45.5 trillion yuan in 2021, a year-on-year increase of 16.2 %.

Portugal has a good foundation in the field of digital economy. Since the outbreak of the new crown epidemic, the Portuguese government has continuously introduced relevant policies to promote the development of the digital economy in the country. At the same time, as one of the member states of the European Union, Portugal's digital economy developed earlier, and its infrastructure, policies and regulations are relatively complete. According to statistics released by D ESI in 2022, Portugal ranks 15th out of 27 EU member states. Portugal's relative rank is slightly lower than that of other member states, so it has greater potential in the digital economy.

China and Portugal have a long-term and stable basis for economic and trade cooperation. As early as the middle and late Ming Dynasty, China had trade relations with Portugal. After the founding of New China, since the establishment of diplomatic relations between the two countries in 1979, the two sides have cooperated strongly and jointly contributed to the bilateral economic development. Especially during the European debt crisis, China extended a helping hand to help Portugal tide over the difficulties. Since 2018, with Portugal signing the "Belt and Road" Memorandum of Understanding and the establishment of the "Blue Partnership" between the two sides, the relationship between the two sides has entered a new period of development. By 2022, the bilateral trade volume will reach US\$ 9.01 billion, a year-on-year increase of 2.4 %. There are also many Chinese direct investment projects in Portugal. China Three Gorges Corporation acquired a 21.35% stake in the Portuguese Electric Power Company, and the State Grid Corporation acquired a 25% stake in the Portuguese Power Grid Company. Sinopec Group acquired a 30% stake in the Brazilian branch of the Portuguese oil and gas company.<sup>[2]</sup>

### **3. Research on the Status Quo of Digital Economy Development in Portugal**

Portugal's digital economy has developed rapidly, which can be reflected in relevant reports in recent years. The following are the salient features of the current status of Portugal's digital economy.

#### ***3.1. Rapid Digital Transformation***

According to a study published by the Organization for Economic Co-operation and Development (OECD) in 2021, between 2010 and 2020 Portugal has made impressive progress in digital transformation, catching up with performance in some areas. Best OECD country. In the post-epidemic era, Portugal chose to use the digital economy and digital technology to stimulate the country's recovery and face long-standing challenges in the future. On April 21, 2020, Portugal released its digital transformation strategy and action plan, which identified digital inclusion, public training, digital transformation of enterprises and public management as national priorities.<sup>[3]</sup> At the same time, Portugal has formulated a route for the development of the digital economy within ten years and linked it with the goals of the policy planning of the "EU Digital Decade Road to 2030" issued by the European Union. This change will effectively promote Portugal's digital transformation.

#### ***3.2. Gradually Improve the Infrastructure***

In 2019, 83% of households were covered by fast broadband and fixed networks. According to the "2022 Digital Economy and Society Index Report" released by the European Union in 2022, Portugal's communication infrastructure is well developed, and most areas have already relatively fast broadband connections. In 2022, about 5.9 million households, or 9.1 % of the country's population, have already at least one broadband connection, and the number of households with the FTTH network of Portugal's largest operator is about 5.7 million, achieving a network coverage of 8.8 %. Portugal's overall penetration of fixed broadband (81%) and that of at least 100Mbps fixed broadband (68%) is growing steadily, especially during the COVID-19 pandemic. At the same time, Portugal is on track to achieve its 2025 goal and 2030 Digital Decade connectivity goal of closing the country's urban-rural network coverage gap and achieving a national mobile network coverage of 95 %.<sup>[4]</sup>

### ***3.3. Innovation of Talent Training Model***

The Portuguese authorities have always implemented the cultivation of digital talents as a strategic goal. In the "Portugal Recovery and Resilience Plan" issued by the Portuguese government, it is planned to provide digital skills training for more than 800,000 people and promote the digital transformation of enterprises, and train digital talents for 30,000 small and medium-sized enterprises. On July 28, 2021, Portugal released the "Vocational Training and Qualification Agreement",<sup>[5]</sup> advocating digital skills training for all unemployed people across the country. Portuguese companies are also actively involved in this issue. The Portuguese digital company JOVEM + aims to conduct a digital technology training program for unemployed teenagers. By the end of 2020, more than 8,000 people have participated in the program. Thanks to various efforts, by 2021, Portugal's ICT expert talents have reached 4.5%, and the number of ICT graduates has reached 3.9%<sup>[6]</sup>. Although it is lower than other EU member states, it still has great room for development. Through the cultivation of digital talents, the Portuguese economy has gradually recovered after the new crown epidemic, meeting the needs of Portugal's increasingly digital economy.<sup>[7]</sup>

## **4. Conditions and Threats of Digital Economy Cooperation between China and Portugal**

### ***4.1. Innovation of Talent Training Model***

#### ***4.1.1. Rapid Digital Transformation***

The bilateral relations between China and Portugal have been in a stable stage for a long time. After the two sides established a cooperative relationship in 1979 and the cooperation between the two sides led to the return of Macao in 1999, bilateral relations entered a period of rapid development. In 2005, China and Portugal formed a comprehensive strategic partnership in 2017<sup>[8]</sup>, the two sides formally established the "Blue Partnership" relationship, aiming at jointly developing in the marine field; Joint Statement on Strategic Partnership and the Memorandum of Understanding on the Belt and Road Initiative. At the same time, Portugal has actively established cooperative relations with China in recent years. It is not only the first EU country to become a "blue partner", but also the first Western European country to join the "Belt and Road".

In terms of economy and trade, the commercial cooperation between China and Portugal has a good foundation. As of 2022, the bilateral trade volume between China and Portugal has reached 90.1%, a year-on-year increase of 2.4%. At the same time, there are many bilateral investment projects between China and Portugal. As of May 2023, the total amount of Chinese investment in Portugal has reached 10.5 billion euros, and the number of Portuguese investment projects in China has reached 308.<sup>[9]</sup>

#### ***4.1.2. The Bilateral Digital Economy Has Complementary Advantages***

China and Portugal have complementary advantages in developing the digital economy. It is mainly reflected in the following aspects.

As a member state of the European Union, Portugal's digital infrastructure is relatively mature. Figures from Statistics Portugal show that in 2021 Portugal's fixed broadband Internet access has reached 78%, fast broadband (NGA) coverage reached 90%, and fixed very high capacity network (VHCN) coverage reached 70%. By the end of 2021, the number of mobile Internet users in Portugal has reached 5.9 million. On December 1, 2022, the number of individual Internet users in Portugal reached 6,473,913<sup>[10]</sup>. The proportion of various parameters is relatively high compared with China. In terms of 5G infrastructure construction and commercial promotion, Portugal is temporarily in a relatively backward position compared with China. According to EU data, Portugal's 5G coverage rate will only account for 12% in 2022<sup>[11]</sup>, while China has participated in the construction of more than 60% of 5G base stations in the world. China's current 5G coverage rate has reached about 90%. By the end of September 2022, the penetration rate of 5G users in China has reached 30%. China's achievements in 5G construction are undoubtedly worthy of Portugal's reference. Therefore, China should learn from Portugal's experience in infrastructure construction to promote the further development of high-tech infrastructure; and Portugal should also cooperate with China in various aspects on new digital technologies such as 5G.

#### ***4.1.3. Relevant Platforms Centered on Macao Playing a Role***

As an important communication hub connecting China and Portugal, Macao has gradually played an important role in recent years with its unique historical and geographical advantages.

In terms of platforms, China can deepen digital economic cooperation with Portugal by establishing relevant institutions in Macau. The China-Portuguese-speaking Countries Economic and Trade Cooperation Forum in Macau is an important part of it. Since its establishment in 2003, the Sino-Portuguese Economic and Trade Forum has always played a role in linking the economic and trade cooperation between China and Portuguese-speaking countries. On June 2, 2023, the "China - Portuguese-speaking Countries Infrastructure Cooperation and Green Development" parallel forum organized by the China-Portuguese-speaking Countries Forum discussed how to use the opportunities of the new era and the multi-party platform led by Macao to carry out cooperation between China and Portuguese-speaking countries. Cooperation between technological innovation and modern finance was discussed; from June 14th to 16th of the same year, the permanent secretariat of the Sino-Portuguese Economic and Trade Forum led a delegation to visit Portugal. In terms of policies, the "Overall Plan for the Construction of the Hengqin Guangdong-Macao Deep Cooperation Zone" released in September 2021 and the "Strategic Cooperation Agreement on Jointly Establishing a China-Portuguese-speaking Countries Science and Technology Exchange and Cooperation Center" released on December 5, 2022 both aim to take advantage of Macao's geographical advantages, we will strengthen scientific and technological exchanges and connections with Portuguese-speaking countries.

#### ***4.2. Threats to China-Portugal Digital Economy Cooperation***

In 2023, the Portuguese authorities issued relevant documents prohibiting suppliers other than member states of the European Union, NATO and the Organization for Economic Cooperation and Development from investing in the 5G field in Portugal. From this incident, it revealed the threat of cooperation between China and Portugal in the field of digital economy.

##### ***4.2.1. Changes in the International Situation***

In 2018, a trade dispute broke out between China and the United States. This incident caused Western countries and organizations headed by the United States to imprison the Chinese economy to a certain extent. Especially in 2019, after the emergence of 5G technology, Western countries blocked the digital technology and banned the export of digital related equipment in order to make the development of China's digital technology lags behind. At the same time, after the outbreak of the Russo-Ukrainian War in 2022, ideological conflicts occurred between Western countries and China due to different camps they support, and the EU's China policy changed. As a member of the European Union, Portugal will inevitably be affected by changes in the international situation and change its attitude towards cooperation with China on the digital economy. This threat is not conducive to the development of Sino-Portuguese digital economic cooperation.

##### ***4.2.2. Differences in Policies and Regulations***

As a member of the EU, Portugal is influenced by the EU to a certain extent in its legal system and related policies and regulations. Although this means that Portugal has a certain reference value for China in terms of policies and regulations, it still poses a certain threat to the development of the digital economy between China and Portugal.

Policy level. As early as 2013, the EU put forward the policy of "strategic autonomy", which aims to reduce the export and entry of external technology and innovation and ensure the EU's autonomy in scientific and technological innovation. This approach is positive to a certain extent, but at the same time there are suspicions of technological monopoly. Especially after the outbreak of the new crown epidemic in 2020, due to the implementation of this policy, China's technology investment in some EU member states has been blocked.

Regulatory level. In 2022, the European Union successively introduced the "Digital Market Act", "Digital Services Act" and "Data Act". These regulations aim to strengthen the intercommunication among member states within the EU, increase the entry threshold of the European market, and weaken the influence of large technology companies in the European market, so as to realize the single EU market. Especially in terms of data access and international data transmission, the EU has made stricter regulations. At the same time, the legal systems of China and Portuguese-speaking countries are different, and it is difficult to provide a unified definition for certain cases related to issues such as digital economy security. Therefore, due to differences in laws and regulations, China-Portuguese digital economy cooperation still needs attention.

## **5. Analysis of the cooperation path of digital economy between China and Portugal**

Through the basic analysis of the digital economy cooperation between China and Portugal, the current situation of Portugal's digital economy and the possible threats to bilateral cooperation, it is possible to formulate a cooperation path for the further development of the digital economy between China and Portugal.

### ***5.1. Expand Bilateral Communication Channels between Countries and Promote Sustained Development of Bilateral Relations***

Before Portugal introduced the entry of high-tech industries, Sino-Portuguese relations had always remained harmonious and stable. In future bilateral cooperation, the stability of bilateral relations is the basis for Sino-Portuguese digital economic cooperation. China and Portugal should expand communication channels in today's changing world situation. In particular, Portugal signed the "Belt and Road" Memorandum of Understanding with China in 2018, and the two sides can communicate effectively through the joint construction of the "Belt and Road". At the same time, Macao has acted as an effective communication bridge in the bilateral cooperation between China and Portugal in recent years, and China and Portugal can effectively use Macao as a platform for cooperation.

### ***5.2. Expand Bilateral Communication Channels between Countries and Promote Sustained Development of Bilateral Relations***

Portugal, as a member of the European Union, has developed digital economy infrastructure earlier, but the development of digital economy-related technologies is relatively backward; while China, as a developing country, is relatively slow in infrastructure construction, but with the arrival of the "5G era", China has advanced by leaps and bounds in digital technology. At the same time, the development of the digital economy has higher requirements for infrastructure. Therefore, China and Portugal should conduct overall planning on digital infrastructure to ensure the stable development of bilateral digital economic cooperation. Taking the construction of a "community with a shared future for mankind" as a benchmark, strengthen bilateral digital technology exchanges and promote the common development of digital technology on both sides.

### ***5.3. Innovate Joint Talent Training Models to Enhance Development Capabilities of Digital Economy***

In the analysis of bilateral digital economy, talent cultivation has always been a major difficulty. At present, there is still a gap of 11 million digital technology talents in China, and the proportion of Portugal's national ICT expert talents in the total population is still lower than the EU average. Therefore, while China and Portugal are developing digital economic cooperation, they should enhance the digital literacy of the people in both countries, integrate digital technology into basic education, and provide the soil for training digital technology talents; strengthen digital technology exchanges between universities and institutions in both countries and digital Technical training provides high-quality digital technical talents for the development of the bilateral digital economy; improves the treatment of technical talents, lowers the entry threshold for digital talents, and mobilizes the enthusiasm of the people of both countries for the development of the digital economy.

## **6. Summary**

China and Portugal have a long history of cooperation, and the cooperation foundation is relatively stable. As a member of the European Union, Portugal's digital economy has been developing for a long time, so its digital economy development is characterized by rapid digital transformation, rapid development of digital infrastructure, and gradual improvement of personnel training system. The development of digital economic cooperation between China and Portugal has relatively stable bilateral relations and complementary advantages in the development of bilateral digital economy. At the same time, Macao, as a bridge connecting China and Portugal, can greatly play a role in promoting bilateral cooperation by serving as a bridge of bilateral communication. But at the same time, due to changes in the international situation, as well as differences in bilateral policies and regulations, there are threats to the development of digital economy between China and Portugal. Therefore, in terms of bilateral cooperation, the two sides should actively carry out communication, jointly promote the development of bilateral infrastructure and technology, and jointly innovate the personnel training system.

In the current period of changes in the international situation, digitalization will gradually become the mainstream development trend. This article only proposes the path of bilateral digital economy cooperation between China and Portugal, hoping to provide some inspiration for the follow-up cooperation among countries around the world.

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