

A Study on the Impact of European Countries' Digital Economy Development on China's Export of Communication Equipment into Europe

Yantong Li, Lingzhi Li

School of Economics & Management, Nanjing University of Science and Technology, Nanjing, China

Abstract. On the basis of combing relevant literature, this paper collects policy and data information, analyzes the status of European digital economy development and the development process and export status of China's communication equipment, this paper finds two theoretical explanation mechanisms combining product life cycle theory and consumer demand theory, which proves the correlation between the development of European digital economy and the export of Chinese communication equipment to Europe.

Keywords: Digital economy, communication equipment, consumer demand theory.

1. Introduction

The digital economy is booming. With the advent of the information age, the digital economy has become integrated into every aspect of daily life. Three years of the epidemic has reinforced this point, living indoors, the control of the epidemic area, workers unable to work, everyone needs to rely on the network and digital technology to maintain their lives. As a result, the development of the digital economy during the epidemic has become unique, rising rather than falling.

In recent years, the governments of various countries have been adapting to the development of the times, and actively issuing policies to encourage the development of their own digital economy. In February 2020, the European Commission published a new strategy for shaping Europe's digital future. On November 30th 2011, French Minister of Industry, Energy and Digital Economy Eric Besson released Digital France 2020. In 2016, several departments in Germany jointly launched the "Digital Strategy 2025", digital development to make unified arrangements. In February 2022, the Government of Ireland launched the Digital Framework for Ireland, which aims to promote and achieve a digital transformation of the Irish economy and society. On 11th July 2024, the Romanian government approved Artificial Intelligence 2024-2027. September 11th 2020, the Swiss federal council adopted the updated version of "Digital Switzerland" strategy.

Research and discussion on the digital economy are also gaining attention in China. Since 2017, the "Digital Economy" has been included in the government work report for six consecutive years. Driven by the 2016 outline for the implementation of the Cyber Power Strategy and the 2018 outline for the development strategy of the digital economy, the digital economy is experiencing a research boom, many domestic and foreign scholars want to explore the past and the present, as well as look forward to the future, of digital economy from Macro and micro angles.

It is of great significance to study the digital economy and its operation mechanism under the background of national policy support, high social attention and enterprise innovation. By showing the development of other countries' digital economy and its actual connotation, we can know ourselves and the counterpart, and stimulate thinking, which will help us to find common development logic from totally different social environment. It will help the growth of the domestic digital economy. In observing the development of other countries' digital economy, we can also find and understand its advantages and disadvantages, enrich our knowledge of the digital economy. Therefore, we can better adapt to the characteristics of countries, corresponding to provide different trade products, increase the coordination of supply and demand, and promote the rational and effective allocation of resources.

At present, China's communications industry is constantly breaking through innovation, it is necessary to summarize the successful experience in time, so as to facilitate the effective diffusion of such advantages to other industries. In this process, we can also combine the development characteristics of different countries' digital economy, find and solve the puzzles in practice, and better guide the future export strategy.

2. Literature Review

2.1. Research on the digital economy

The term “Digital economy” was first coined by Tapscott (1996) in the 1990s. But this book, the digital economy, fails to explain what it is. From the end of 1990s to the beginning of 21st century, because of the rapid development and gradual popularization of the internet, China's research on the digital economy is increasing. With the rapid spread of the Internet, the volume of literature in 2016 began to multiply, supported by policies such as the National Program for the implementation of the Cyber Power Strategy and the National Program for the development of the digital economy. Under the epidemic, the importance of the digital economy has become more prominent. In 2023, research literature reached a peak. Even today, the popularity of research keeps unabated.

So what does it mean to be a “Digital economy”? Different countries and scholars at home and abroad still hold different opinions. This paper defines “Digital economy” align with the European Commission: Generically refers to the amalgamation of aspects involving “An economy based on digital technologies”.

Pang Jian and Zhu Xinmin (2013) predict that the future digital economy will be combined with products and services to form smart families, smart cities and smart countries.

Jing Wenjun and Sun Baowen (2019) argue that the digital economy has done a good job of stimulating consumption, stimulating investment, creating jobs, and enhancing innovation and competitiveness. This paper discusses the mechanism of digital economy promoting economic growth from macrocosm and microcosm. At the micro level, the new economic environment made up of emerging technologies can better match supply and demand; at the macro level, digital economy promotes economic growth through three internal mechanisms: new input factors, new resource allocation efficiency and new total factor productivity.

2.2. Research on the export of communication industry and its products

Zhang Yue (2012) pointed out that the demand for information and communication has taken on new characteristics: demand upgrading and value transfer. People's demand for information and communication has already changed from simple voice communication to new demand such as leisure and entertainment, which will also create new value.

Wang Keyi et al. (2020) combined with the new situation of the epidemic analysis of its impact on the development of China's information and communications industry. China's powerful information and communications industry has undoubtedly addressed many of the new demands of the pandemic, helping to bring about rapid information sharing and openness, while also spurring the development and innovation of new features.

Jiang Yue (2019) selected the African region targeted study of China's information and communications industry development strategy. This paper analyzes the entry of China's information and communication industry into Africa from three aspects: infrastructure construction, potential demand and growth situation, and takes Huawei as an example to make a concrete case analysis.

Chen Songchen and others (2023) divided China's information and communication industry into the initial stage of exploration, expansion of scale and market share stage, enhance brand influence and international strategy stage, global layout and international operation stage.

2.3. Research on the relationship between the digital economy and the communications industry

Most of the articles put the communication industry under the background of digital economy, mainly about the path of industry development, the transformation of specific enterprises, product trade competitiveness and so on. There are few articles that directly analyze the relationship between the digital economy and the communication industry.

Dong Xiaoying and Li Yue (2024) emphasize that digital economy is the key force and the biggest increment to restructure global factor resources, reshape global economic structure and change global competitive pattern. China's information and communication enterprises can seize the opportunities of the belt and road, give full play to their own advantages, look to the world and share the dividends of the digital economy. The article suggests that enterprises should adapt to local conditions and carry out accurate trade in different regions.

Wen Ku (2022) refers to the information and communication industry as the “Oxygen” of data bearing and digital operation, which plays a fundamental and important role in the era of digital economy and digital process.

Wu Yaqi (2023) from the perspective of enterprise management analysis of the digital economy, a communication infrastructure companies how to carry out strategic transformation. Starting from the specific situation of the company, this paper discusses the survival and development strategy of the company under the new situation.

3. The development of European digital economy and the status of China's communication equipment exported to Europe

3.1. Policy preferences of European governments for the development of the digital economy

In 2020, the European Commission identified the digital economy as the core of its priorities and as the most important driver of innovation, competitiveness and employment. In March 2021, the European Commission published a vision and roadmap strategy for the digital transformation of Europe 2020-2030. This is a “Digital compass” that turns the EU's digital transformation into concrete and realistic goals, which includes four key points: people with digital skills, safe and sustainable digital infrastructure, digital transformation of enterprises and digital transformation of public services. The European Union as a whole is paying great attention to the development of digital economy, intended to enhance the level of digitization from individuals, enterprises, governments and society.

The chart below shows the overall household internet take-up and personal internet use in the 28 countries of the European Union, with over 85 per cent of households in all countries having access to the internet, more than 80% of individuals in almost all countries use the internet. It can be said that the level of Internet coverage in Europe is very high. When it comes to digitizing public services, all countries except Romania score above 80 on the “Mobile friendliness”, this shows that mobile devices offer great convenience to individuals living in EU countries.

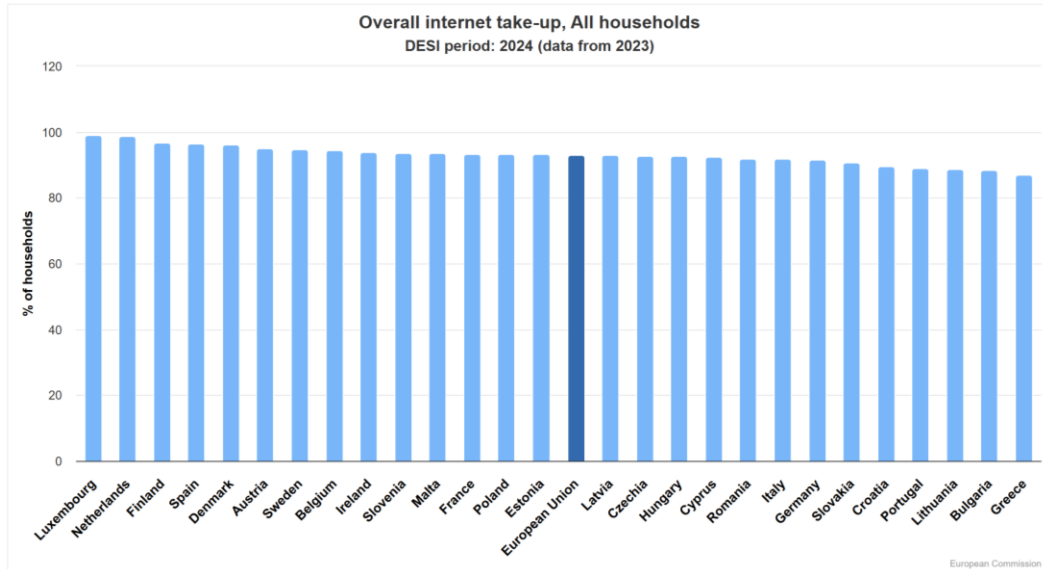


Figure 1. Period 2024 overall internet take-up of all households

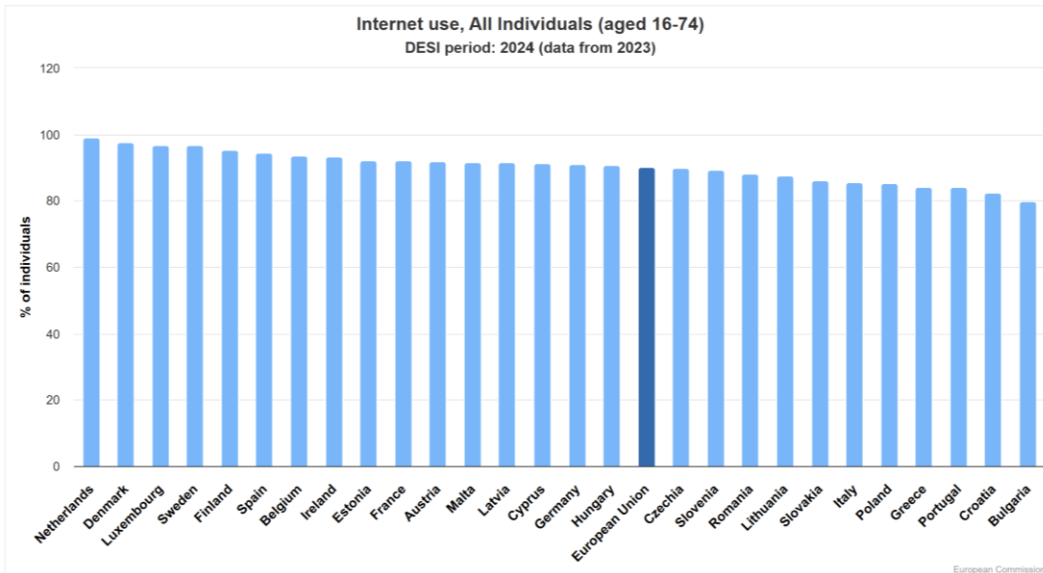


Figure 2. Period 2024 internet use of all individuals

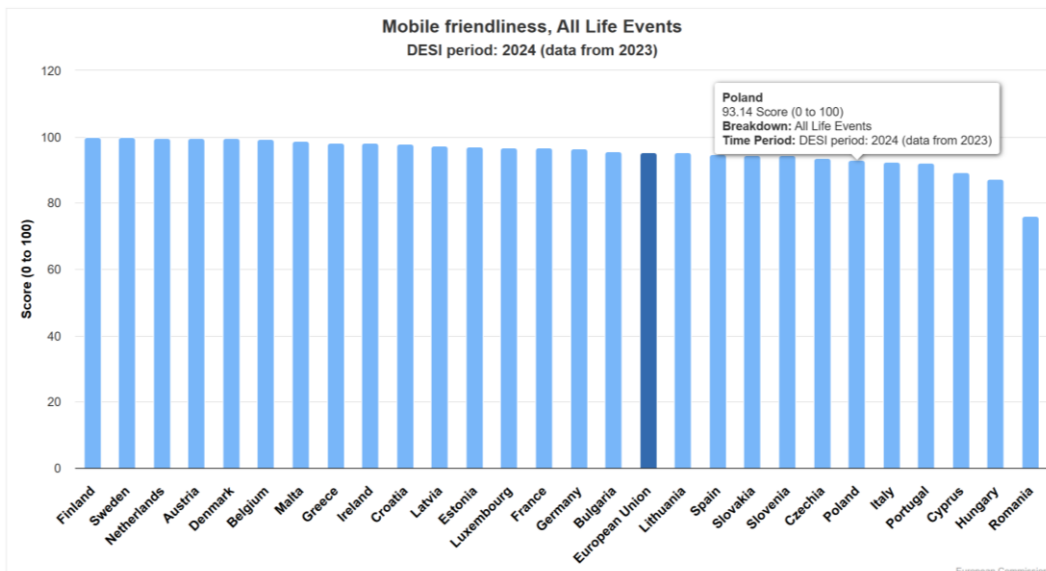


Figure 3. Period 2024 mobile friendliness of all life events

Countries outside the EU are no exception. The official website of the Albanian government can be searched for a lot of documents on digitization, and it can be found that the Albanian government actively encourages the promotion of the tourism digital platform and the construction of the digital technology center. Even awards are given in support of digital governance and digital learning. In 2023, the Government of Albania released a national travel calendar that includes year-round cultural, sports and traditional events, available through TEA, a free mobile app that anyone can install, in time for the peak summer travel season. The UK's Digital Economy Act (2017) shows that the UK's digital economy is growing rapidly and digital technology is transforming every sector of production and every aspect of life. Britain's determination to remain ahead and world leader in the digital economy was made clear in this Act, promising broadband for everyone living anywhere in the UK, better infrastructure for a digital future, better public services with digital technology, and so on. More than £1 billion of investment in high-speed broadband in towns and villages, and more than £500 million in connectivity by 2023 will benefit more than 330,000 households and businesses, according to government documents.

3.2. Status of China's communications equipment development and exports to Europe

Since the reform and opening-up, China's communication equipment manufacturing industry has embraced the globalization actively, through the introduction of advanced technology, digestion and absorption re-innovation, has realized the magnificent turn from following to running and even leading. In view of the young global history of the telecommunications equipment manufacturing industry and our unique advantages -- abundant cheap labor resources, huge market potential and unwavering government support, China's communication equipment manufacturing and processing ability quickly ascends to the top of the world, and successfully becomes the center stage of the global communication equipment manufacturing industry.

In recent years, the government has issued a number of policies to actively promote the development of communications equipment industry, these policies for the development of the industry provide policy support and direction guidance. The national strategy for the development of informatization, published by the State Council General Office in 2016, proposes building ubiquitous and efficient information networks, improving information security and industrial security systems, and accelerating the digital transformation, the advantage of information technology reflects that the state attaches great importance to the development of communication equipment industry and strategic planning.

At present, China is stepping into the gate of 5G era, the tide of mobile internet is more and more surging. 5G, with its unparalleled high-speed transmission, ultra-low latency and ultra-large capacity, not only greatly meets the user's demand for the ultimate network experience, it has become a powerful engine to promote the development of the Internet of things, artificial intelligence, intelligent manufacturing and other frontier science and technology fields. According to statistics, the Global 5G Communications Equipment Market in 2022 is about 33 billion U. S. dollars, is an important source of revenue for communications equipment manufacturers. With the rapid development of new generation information technology and the continuous expansion of application scenarios, the downstream market of communication equipment manufacturing industry will face a broader development space. Whether it is smart city, smart manufacturing or telemedicine and other emerging fields, there will be a huge demand for communication equipment for the entire industry to bring new growth and development opportunities. For example, in the field of smart city, 5G technology can be applied to traffic, security, environmental protection and other fields, improve urban management and service level. The need for these scenarios will further drive the development of the communications equipment industry.

In China, 5G, Gigabit Optical Network and other network infrastructure is becoming increasingly complete. The basic telecommunications enterprises are actively deepening the partnership with the upper and lower reaches of the industrial chain, promoting the innovation transformation of business models, accelerating the pace of cross-border integration, and devoting themselves to building a more

intelligent network and terminal ecosystem. Data Center, cloud computing, big data, Internet of things and other emerging services are developing rapidly, with total business revenue of 356.4 billion yuan in 2023, an increase of 19.1 percent over the previous year, according to the statistics bulletin of the communications industry, the share of telecom revenue increased from 19.4% to 21.2%, which contributed to the growth of 3.6 percentage points. Revenue from cloud computing and big data services grew by an average of 37.5 percent and revenue from Internet of things services grew by 20.3 percent. The large-scale application of cutting-edge Technologies, such as cloud computing, Internet of things, big data and artificial intelligence, is injecting a steady stream of innovation into the industry, driving its continuous and steady growth. The above shows that the development of China's communications industry has promoted the construction of network power and Digital China, and promoted the deep integration of digital economy and real economy.

From a global perspective, the total value of China's exports of communications equipment to the world in 2023 was about US \$219.636 billion, of which total exports to European countries were about US \$41.147 billion, accounting for about 19%. Over the past five years, the share of China's communications equipment exports to Europe has remained at about 20 percent. Among them, wireless network smartphone exports secured the highest volume, about US \$24.98 billion, accounting for about 61% of all communications equipment exports from China to Europe.

Competition in the global communications equipment industry is fierce, and companies are constantly engaged in technological innovation and product upgrading to maintain their competitive edge. At present, the global communication equipment industry competition pattern mainly by Huawei, Ericsson, Nokia, ZTE and Cisco companies. In 2021, Huawei and ZTE had a market share of about 29 percent and 11 percent respectively in the communications equipment industry. Huawei, as China's leading telecommunications equipment company, has a leading edge in 5G technology, it also has a wide range of customers and partners around the world.

4. The analysis of theoretical mechanism

4.1. Product life cycle theory

In 1966, Harvard professor Raymond Vernon proposed the product life cycle theory, the whole process of a newly developed product existing in the market is divided into four stages: introduction stage, growth stage, maturity stage and decline stage.

Since Apple released the first iPhone in San Francisco in 2007, all kinds of communication devices, such as smart phones, are opening a new round of product life cycle in the United States. New form, new technology and new features are the keywords. Mobile phones, for example, are no longer clunky and hard to carry, but lighter and more portable. The realization of new technology brings new transmission medium, bring up new connection way. Better performance in speed, stability constantly brings people surprises. The new extended function enables the mobile phone to construct the human-to-human connection and the human-to-world connection in more wonderful ways besides the calling message.

Since China's reform and opening-up, it has continuously introduced foreign advanced manufacturing products and investments, and built up its manufacturing base by learning production technology and management experience, in this process, many outstanding enterprises have emerged, and gradually brought the life cycle of new communication equipment into a mature stage in China. In this phase, these companies rely on skilled technology, large-scale production capacity and highly competitive prices to enter the larger global market.

On top of that, China's best companies unlock the full potential of innovation and create new breakthroughs in new areas, such as communications technology, thus opening up another product life cycle. In the life cycle of the products and services related to the fifth generation mobile communication technology, Chinese enterprises have come to the forefront of innovation, occupying the leading position in the product introduction and growth stages. The superior performance of products equipped with the new generation of communication technology, faster and more stable use

of the experience, can attract consumer to these Chinese products. In Europe, where people have a high level of digital awareness and digital skills, the demand for communication equipment is not low. The European market has been successfully opened up and continues to expand as Chinese communications equipment coincides with a high level of digital growth.

4.2. Consumer demand theory

In the midst of the digital economy, new demand will naturally emerge from all parts of Europe. Most of the real economy, from selling goods to providing services, is increasingly having online channels, and governments are actively opening up online government platforms. In this context, consumers, enterprises and governments all have a huge demand for communications equipment. For consumers, smartphones are becoming more and more indispensable, and their performance and price are getting more and more concern. For Enterprises, the timely communication and coordination of work needs fast and stable communication equipment. For the government, a secure and reliable communications infrastructure is the key to development. The need for imported communications equipment is also stimulated by the fact that domestic markets may not be able to adequately meet the surge in demand.

Since the 18th National Congress of the CPC, China has attached great importance to innovation and development. "Mass entrepreneurship and innovation" "Science and technology is the first productivity, talent is the first resource, innovation is the first driving force". The government not only encourages innovation, but also raises the investment of innovation R&D expenditure and fosters innovation talents. Under the good environmental support and care, the quality of China's communication equipment has been greatly improved, and the products loaded with cutting-edge technology have attracted a lot of attention. This, combined with China's domestic manufacturing prowess, created a clever match between supply and demand within the European market, leading to a significant increase in Chinese exports of communications equipment.

5. Conclusion and enlightenment

This paper starts from the research background of digital economy and communication industry, and analyzes the increasing importance and value of digital economy in daily life. Countries are actively grasping the pulse of the times and adopting policies to ensure the harmonious and orderly development of the digital economy.

After analyze European commission's article description and statistical data, it is found that European countries' digital penetration level is relatively average, the overall situation is good. European governments are also actively helping to develop and spread the digital economy. Then, by reviewing the past development of China's communications equipment, to the current trend, China's communications equipment has accumulated a wide range of industry competitiveness, and also lays a solid foundation for development. Data analysis also shows that China's market share in Europe is not to be underestimated.

In the part of theoretical mechanism, it turns out that the general products of communication equipment in China are in the mature stage with obvious price advantage, while the innovative products are in the growth stage with obvious technical and functional advantage. As a result, China's telecommunications equipment can occupy a considerable share of the European market, and with the development of the local digital economy to maintain sustained export growth. With the development of European digital economy, the market is expanding along with the new demand, so the value of China's high cost-effective communications equipment exports to Europe continues to climb.

To sum up, by encouraging innovation and adhering to open development, China has embarked on a path of development with Chinese characteristics for a new era. With the goal of becoming a strong country in science and technology, China has persisted in solving technological problems on its own and, step by step, firmly hold in its own hands the initiative for more development. It will be

more encouraging if there can be more outstanding Chinese enterprises achieving bold innovation, head held high into the broader market around the world.

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