

# The Path Selection of China's Chip Independent Innovation and the Influence of United States Technology Blockade

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**Abstract:** The purpose of this paper is to discuss the path selection of independent chip innovation in China and the influence of technology blockade in the US. Firstly, this paper introduces the current situation and development trend of global chip industry, and analyzes the current situation and challenges of chip industry in China. Secondly, this paper discusses the path selection of independent chip innovation in China from the perspectives of technology, industry and market, and puts forward corresponding policy suggestions. Finally, this paper analyzes the influence of US technology blockade on China's chip independent innovation and its countermeasures. The research shows that if China's chip industry wants to gain advantages in the fierce global competition, it must strengthen independent innovation and improve its own technical level and innovation ability. At the same time, it is necessary to actively respond to the impact of the US technology blockade, strengthen international cooperation, and promote the healthy development of the global chip industry. I hope the research in this paper can provide some theoretical support and practical reference for the independent innovation of China's chip industry, and contribute to the future development of China's chip industry.

**Keywords:** China Chip; Independent Innovation; Path Selection; United States; Technological Blockade.

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## 1. Introduction

With the rapid development of science and technology, chip has become one of the most important technologies in modern society [1]. It has penetrated into every aspect of our daily life, from electronic products such as mobile phones, computers and televisions to high-end equipment such as automobiles, airplanes and spacecraft, and chips are everywhere [2]. However, due to historical and practical reasons, the development of global chip industry has been dominated by a few countries such as the US and Europe [3]. These countries have advanced chip design and manufacturing technology, and through the monopoly and control of the chip industry, they have mastered the dominance of the global chip market [4-5]. However, developing countries, including China, have a relatively low position in the global chip industry. Although China has made some progress in the chip industry in recent years, compared with developed countries, there is still a big gap in the overall level and innovation ability of China's chip industry.

In the past few decades, the global chip industry has experienced rapid development and change [6]. From the initial vacuum tube technology to the later transistor technology, to the integrated circuit technology, and now the VLSI technology, the progress of chip technology constantly promotes the development of the global electronics industry [7]. However, with the continuous progress of technology, the global chip industry is also facing many challenges. One of the most important problems is that the speed of technological upgrading is very fast, which requires enterprises to continuously invest a lot of money and human resources in R&D and innovation [8]. In addition, the competition in the global chip market is becoming increasingly fierce, and enterprises need to constantly improve their technical level and innovation ability in order to be invincible in the market [9]. At present, the government and enterprises in China have

gradually realized the importance of independent chip innovation, and started to increase investment and research and development in the chip industry.

The purpose of this paper is to discuss the path selection of independent chip innovation in China and the influence of technology blockade in the US. In recent years, the US government has taken a series of restrictive measures against China's chip industry. These measures include prohibiting the sale of advanced chip technology and equipment to China and restricting China enterprises from investing in the US [10]. These restrictions will not only affect the development of China's chip industry, but also have a certain impact on the global chip industry. However, the lack of independent innovation capability of China's chip industry has also attracted much attention. Therefore, it is of great practical significance and theoretical value to discuss the path selection of independent chip innovation in China and the impact of technology blockade in the US.

## 2. Challenges and Opportunities Faced by China's Chip Independent Innovation

China's development in the field of chips is facing great challenges and opportunities. With the intensification of global competition in science and technology, the US government has imposed a series of technical blockades and restrictions on China, which further aggravated the difficulty and pressure of independent chip innovation in China. Therefore, it is of great significance to discuss the path selection of independent chip innovation in China and the influence of technology blockade in the US.

### 2.1. Challenges

The challenges faced by independent chip innovation in China include technology, capital, market and talents. First of

all, there is a gap between China and developed countries in chip technology, and it is necessary to strengthen technology research and innovation [12]. Secondly, China needs to solve the shortage of funds and increase investment in the chip industry. In addition, China needs to face fierce market competition, including international giants and domestic competitors; It is necessary to solve the problem of talent shortage and attract and train more outstanding talents.

## 2.2. Opportunities

The opportunities faced by China's independent chip innovation include policy support, market demand and international cooperation. First of all, the China Municipal Government has issued a series of policies to support the development of the chip industry, including financial support and tax incentives. Secondly, the huge market demand in China provides a broad development space for the chip industry. At the same time, China also actively participates in international cooperation to promote the development of the global chip industry.

## 3. China Chip Independent Innovation Path Choice

The path selection of independent chip innovation in China and the influence of technology blockade in the US are complex issues, which need to be considered and dealt with

from many aspects. At present, China needs to strengthen technological research and innovation and improve its independent innovation ability; Strengthen industrial integration and upgrading to improve industrial competitiveness; Strengthen market promotion and marketing, and increase market share and brand influence. Only by strengthening independent innovation, upgrading industrial chain, policy support and technical blockade can we promote the development of China's chip industry and improve the international competitiveness of China's chip industry. The details are as follows: (1) Independent innovation: China has made some achievements in the field of chips, but it still needs to strengthen independent innovation. The China Municipal Government has taken a series of measures, including increasing support for scientific research institutions and enterprises, and strengthening the training and introduction of talents. These measures are helpful to improve the independent innovation ability of China chip industry and accelerate the development of China chip industry. The new mode of independent innovation means that enterprises rely on their own strength to carry out research and development, independently complete a series of innovative work, and realize the commercialization, industrialization and internationalization of scientific and technological achievements. The classification of technological innovation modes is shown in Figure 1.

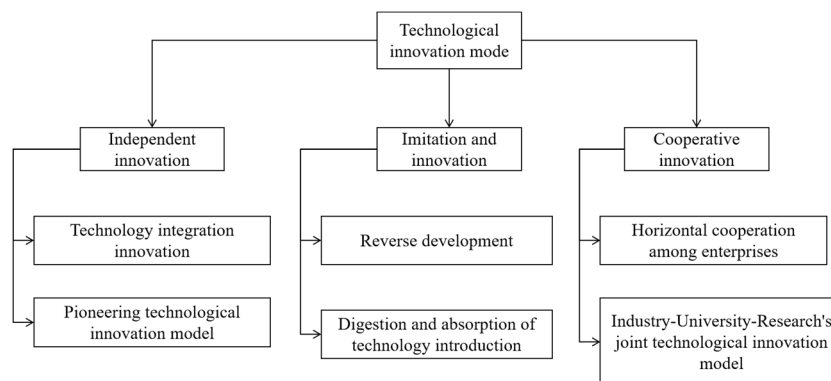


Figure 1. Classification of technological innovation modes

(2) Industrial chain upgrade: China chip industry needs to speed up the industrial chain upgrade and improve the level and quality of chip design, manufacturing, packaging and testing. At the same time, it is necessary to strengthen international cooperation and improve the international competitiveness of China's chip industry. (3) Policy support: The government needs to increase policy support for the chip industry, including financial support, tax incentives, and talent introduction. These policies will help attract more enterprises and talents to China and promote the development of China's chip industry. (4) Technology blockade: The US. technology blockade against China has had a great impact on China's chip industry. These restrictions not only restrict the development of China's chip industry, but also affect the international competitiveness of China's chip industry. Therefore, China needs to take measures to deal with the US blockade, including strengthening independent research and development and strengthening international cooperation.

## 4. US Technology Blockade on China's Chip Independent Innovation

The technology blockade of the US has had many

influences on the independent innovation of China's chips. On the one hand, the technology blockade of the US has greatly restricted China's development in the field of chips. China needs to rely on other countries' chip technologies and markets, which greatly limits China's independent innovation in the field of chips. On the other hand, the technology blockade of the US also makes China's independent innovation in the field of chips more urgent. China needs to work harder to develop its own chip industry to reduce its dependence on other countries. This requires China to make more independent innovations in the field of chips, including developing new technologies, designing new chips and developing new applications. Finally, it also promoted the change of international cooperation and cooperation mode of China's chip industry. China's chip independent innovation needs to adhere to the principles of self-control, open cooperation, and at the same time pay attention to strengthening talent training and introduction to improve the ability of independent innovation; Strengthen international cooperation to jointly meet the challenges faced by the global chip industry. At present, China has made some progress in chip independent innovation, but it still faces many

challenges. Based on this, China government has taken a series of measures, including strengthening research and development, promoting industrial upgrading, and strengthening personnel training.

### 5. China Chip Independent Innovation Policy Support and Industrial Cooperation

China Municipal Government has been actively promoting independent innovation of chips, and increasing its support for the chip industry by formulating relevant policies and regulations. For example, the government of China has issued policies such as "Made in China 2025" to encourage

enterprises to strengthen independent innovation and promote industrial upgrading. In addition, the government of China actively promotes cooperation with international enterprises and promotes inter-industry exchanges and cooperation. At the same time, China's chip industry has also made remarkable progress in independent innovation. For example, companies such as Huawei and Hisilicon supported by the China government have made important achievements in the field of chips. In addition, China's chip industry has also actively carried out international cooperation, jointly researched and developed with international enterprises, and promoted industrial upgrading. See Figure 2 for the framework of enterprise factors affecting the development of high-end chips.

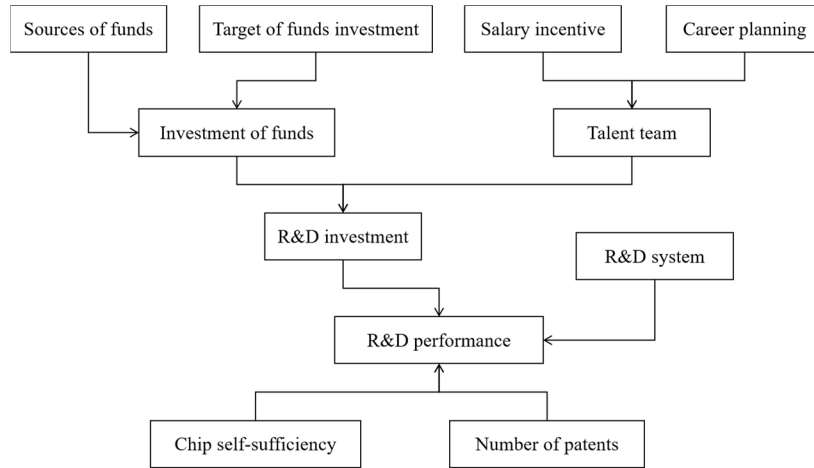


Figure 2. Enterprise factor framework that affects the development of high-end chips

The technology blockade of the US has had an important impact on the development of China's chip industry. The US government has restricted the development of China's chip industry by restricting technology exports to China and restricting China enterprises' investment in the US. This not only affects the independent innovation of China's chip industry, but also affects the international cooperation and competition of China's chip industry. China government and industry need to continue to strengthen policy support, industrial cooperation and international cooperation to meet the challenges and opportunities. At the same time, we also need to strengthen independent innovation and intellectual property protection to ensure the sustainable development of China's chip industry.

### 6. China Chip Independent Innovation Development Trend

At present, the development trend of independent chip innovation in China is worthy of recognition. China Municipal Government has taken a series of measures to promote independent innovation of chips, including strengthening policy support, increasing capital investment and strengthening personnel training. These measures are helpful to improve the independent innovation ability of China chip industry and promote the development of China chip industry. Undeniably, the impact of US technology blockade on China's chip industry cannot be ignored. The US government has taken a series of restrictive measures against China's chip industry, including prohibiting the sale of advanced chip technology to China and restricting China enterprises from investing in the US. These restrictions will not only affect the development of China's chip industry, but

also have a certain impact on the global chip industry. However, it should be pointed out that the development trend of independent chip innovation in China and the influence of technology blockade in the US are interrelated. The independent innovation of China's chip industry needs the support of the government and enterprises, while the US technology blockade can accelerate the independent innovation of China's chip industry.

### 7. Conclusion

Based on the development status and trend of global chip industry, this paper deeply discusses the path selection of independent chip innovation in China and the influence of technology blockade in the US. Through research, this paper holds that if China chip industry wants to realize independent innovation, it must strengthen technology research and innovation, promote industrial upgrading, strengthen talent training and introduction, and improve its own technical level and innovation ability. At the same time, it is necessary to actively respond to the impact of the US technology blockade, strengthen international cooperation, and promote the healthy development of the global chip industry. For policy makers, it is suggested that the government and enterprises should increase investment and R&D in the chip industry, formulate corresponding policies and plans, and support the independent innovation and development of the chip industry in China. At the same time, it is necessary to strengthen international cooperation to promote the healthy development of the global chip industry. For enterprises, it is suggested that enterprises should pay attention to the cultivation and introduction of talents, strengthen independent research and development and innovation, and improve their own technical

level and innovation ability. At the same time, it is necessary to actively respond to the impact of the US technology blockade, strengthen international cooperation, and promote the healthy development of the global chip industry. Generally speaking, China's independent chip innovation is an important driving force to promote the development of the global chip industry. The government and enterprises should actively respond to the impact of the US technology blockade, strengthen independent innovation and technical cooperation, and promote the healthy development of the global chip industry.

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