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Original Paper

International Comparative Study on the Growth of Strategic Emerging Industries

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Abstract

As the core carrier of the new round of scientific and technological revolution and industrial reform, strategic emerging industries have become an important starting point for countries to seize the initiative in reshaping the global economic pattern. This paper selects four representative countries, the United States, Germany, Japan and China, and systematically compares the factual characteristics, antecedents, process mechanism and evolution path of the growth of strategic emerging industries. The research finds that: first, at the level of industrial layout, the four countries have formed a "multi habitat" development pattern in the United States, a "high-tech" development pattern in Germany, a "refined" development pattern in Japan and a "coordinated" development pattern in China based on their respective economic bases, resource endowments and development needs. Second, at the level of antecedents, digital infrastructure construction and fiscal and tax incentive policies constitute the key supporting environment for industrial growth. Among them, the construction of digital infrastructure shows the differentiation path of Chinese government leading, American market leading, government participation, German government leading and Japanese social traction; The fiscal and tax incentive policies are respectively reflected in China's emphasis on resource allocation and national strategic coordination, the United States' emphasis on the combination of pre support and post incentive, Germany's preference for long-term stable support, and Japan's focus on green industry guidance. Third, at the process mechanism level, innovation driven development and international development constitute the dual driving forces of industrial growth. In terms of innovation drive, China has formed an integrated innovation model, the United States has focused on disruptive innovation, Germany has promoted incremental innovation relying on the government, industry, University and research system, and Japan has driven open innovation with the "government, industry, University" integration mechanism; In terms of international development, China is characterized by a rising industrial chain driven by both policy and market. The United States relies on technological advantages to dominate global standards and

industrial chain layout, Germany relies on industrial infrastructure to promote the deep integration of industrial chains, and Japan relies on government enterprise collaboration and multi-level policy support to achieve global expansion. Through international comparative research, this paper reveals the multi-path mode and system adaptation logic of the growth of strategic emerging industries, and provides a systematic analysis framework for understanding the development law of emerging industries in different countries.

Keywords

Strategic emerging industries, International comparison, Innovation driven, International Development

1. The Factual Characteristics of the Growth of Strategic Emerging Industries

In recent years, countries have introduced new development strategies, increased efforts to develop strategic emerging industries and cultivate new drivers, and taken the promotion of breakthroughs in key areas and the development of innovation and entrepreneurship as an important starting point for the new round of scientific and technological economic competition, striving to seize a favorable position in the reshaping of the global economic pattern (Sheng Chaoxun, 2016). From developed countries to developing countries, countries have carried out systematic planning and policy support for the cultivation of strategic emerging industries. Based on the different economic bases, resource endowments and development needs of various countries, the layout of strategic emerging industries shows a trend of diversification and characterization. In the United States, the development of strategic emerging industries focuses on the "multi habitat" layout, emphasizing innovative breakthroughs in the fields of new energy, new generation information technology and biomedicine; In Germany, it focuses on the "high-end, sophisticated" development pattern of high-end manufacturing, new generation information technology and new energy, emphasizing industrial upgrading and technological frontier breakthroughs; while Japan is committed to "refined" development, promoting the refined layout of new energy, new materials and information technology, and striving to maintain its technological advantage in the global industrial chain; China adopts "coordinated" development, relying on the new generation of information technology, high-end equipment, new energy and other fields to promote the deep integration and collaborative development of cross industries and cross fields.

1.1 The United States: focusing on the "multi habitat" development pattern of new energy, new generation information technology, biomedicine, etc.

As a typical developed country, the United States not only has strong R&D strength and industrial foundation, but also has strong market perception. Over the years, it has mainly formed a "multi habitat" strategic emerging industry development pattern with new energy, new generation information technology, and biomedicine as the core. First of all, for the new energy sector, after the 2008 financial crisis, the U.S. government took innovation as the driving force for the development of strategic emerging industries, attached great importance to the development of the new energy sector, regarded it as the core drive to promote the transformation and upgrading of the industrial system and achieve industrial

revitalization, and then opened up a unique path with the development of new energy as the core. In February, 2009, the Obama administration provided $46.8 billion in funding support for new energy and energy efficiency projects in the American Recovery and Reinvestment Act; The Obama Biden new energy plan proposed that the U.S. government would invest 150billion dollars to fund the research of alternative energy (Ma Jingzhou & Wu Xinmu, 2018). Since then, the U.S. government has also attached great importance to the new energy industry and regarded it as the "main law" of the development of strategic emerging industries. Secondly, in the field of new generation information technology, the trump administration emphasizes strengthening the industrial leadership of new generation information technology such as quantum technology, artificial intelligence and advanced communication, and signed the national quantum initiative act and the national human intelligence initiative in December 2018 and February 2019, respectively. Finally, in the field of biomedicine, as early as 2011, the U.S. government proposed to increase the biomedicine funding for national health research institutions from 1billion yuan to 32.1 billion yuan (Luo Zuchun & Fan Wei, 2011); In September 2022, President Biden signed the "National Biotechnology and biological manufacturing plan", and the United States further strengthened its support for health medicine, biotechnology and other fields.

1.2 Germany: focusing on the "high-end, sophisticated" development pattern of new energy, new generation information technology, high-end manufacturing, biotechnology, etc.

As an old industrial power, Germany is famous for its strong technological innovation and high-end manufacturing. Since the 19th century, Germany has always been the main leader in the development of global strategic emerging industries (Wang Zhiwei et al., 2019). In recent years, Germany has focused on "holding the commanding heights" in high-end industries and high-end links, and laid out strategic emerging industries around high-tech fields such as new energy, new generation information technology, high-end equipment manufacturing, biotechnology, etc. First of all, in the field of new energy, Germany regards it as the key pillar of the development of strategic emerging industries. Since 2010, it has officially launched the "energy transformation" strategy, and successively issued the "photovoltaic strategy", "onshore wind energy strategy" and "national hydrogen energy strategy" to promote the transformation of industrial decarbonization and the rise of high-tech industries. Secondly, in the field of new generation information technology, in July 2010, the German government issued the "high technology Strategy 2020", which proposed to rely on the research of new technologies and expand innovation (Ma Jingzhou & Wu Xinmu, 2018). Among them, the government focuses on the breakthrough innovation in frontier technology fields such as microelectronics, quantum technology and artificial intelligence, and promotes the further high-end structure of strategic emerging industries (Cao Jianing, 2019; Li Xiaoyan, 2020). In April 2023, the German federal government adopted the quantum technology action plan, providing about 3billion euros to support the research, development and application of quantum technology; In November 2023, the German Federal Ministry of education and Research (BMBF) released the AI action plan, which plans to add 20 AI initiatives and invest more than 1.6 billion euros. In addition, in the field of high-end manufacturing, Germany actively promoted the

"industry 4.0" strategy, focused on supporting the development of high-end manufacturing industries such as smart factories and automated equipment, and successively issued the "high tech strategy 2025" and the "national industrial strategy 2030" in 2018 and 2019. Finally, in the field of biotechnology, Germany put forward the "national decade" anti-cancer plan in September 2014, and invested about 1billion euros to plan to use digital technology to innovate the biological medical system; In the future research and innovation strategy issued in February 2023, it is emphasized to accelerate the industrialization process in frontier technology fields such as gene editing, precision medicine and biomaterials.

1.3 Japan: focusing on the "refined" development pattern of new energy, new materials, and new generation of information technology applications

Japan has always adhered to the concept of "building a country through scientific and technological innovation", taking scientific and technological guidance and local conditions as the basic principles for the development of strategic emerging industries. Following this principle, Japan has carefully arranged in the fields of new energy, new materials and information technology applications, forming a refined development pattern. First of all, in the field of new energy, the lack of resources for a long time has stimulated Japan's huge demand for new energy. The Japanese government attaches great importance to the development of the new energy sector and improves the degree of marketization through continuous research and development of new technologies. In May, 2009, the new national energy strategy issued by the Japanese government proposed to focus on energy-saving vehicles, low-carbon economy, clean energy power generation and other aspects (Qin Hailin, 2014); In December 2020, the Japanese government issued the green growth strategy, which plans to invest more than 20trillion yen in hydrogen, solar and wind energy industries and related energy storage technologies by 2030. For the field of new materials, the Japanese government focuses on building a high-tech industrial chain with the semiconductor industry as the core. In June 2021 and February 2022, the Japanese government launched the semiconductor and digital industry strategy and the detailed rules for supporting the semiconductor industry respectively, aiming to maintain Japan's technological advantage in the semiconductor field through refined research and development. For the new generation of information technology applications, Japan takes further expanding and strengthening the robot industry as an important starting point for innovation. In the 21st century, Japan has successively issued a series of policy plans, such as the e-Japan strategy, the u-japan strategy, and the i-japan strategy, which guide the development direction of Japan's scientific and technological innovation from the perspective of the most cutting-edge science and technology. In January, 2015, Japan announced the new robot strategy, which proposed three core goals: strengthening robot R&D and innovation, promoting robot application and promoting the development of robot industry; In January 2016, the Japanese government focused on social applications and proposed to build a world-leading "super intelligent society (5.0 Society) with information technology and manufacturing as the core. Its R&D and industrial development support also focused on related robot technology and sensor technology; In March, 2021, the Japanese government issued the

sixth basic plan for science and technology innovation to promote the formation of an industrial layout with 5g, post 5g, artificial intelligence, supercomputer, quantum technology and other new generations of science and technology as the core. It plans to invest about 4trillion yen in five years to promote the industrialization of basic research, applied research and scientific and technological innovation achievements.

1.4 China: a "coordinated" development pattern focusing on the new generation of information technology, high-end equipment, new energy, etc.

As the world's largest developing country, China is actively deploying strategic emerging industries, and has formed a "coordinated" development pattern of strategic emerging industries with new generation of information technology, high-end equipment, new materials, and new energy as the core. For the new generation of information technology, the policy focuses on two aspects: "digital industrialization" and "industrial digitalization" (Bai Peiwen & Yu Li, 2021). The former is mainly to cultivate and develop emerging digital industries, such as promoting the development of a new generation of information and communication industry and related manufacturing industries, cultivating and developing big data, cloud computing, artificial intelligence and other industries; The latter is mainly to promote the deep application of new generation information technology in traditional industries. In October, 2010, the State Council issued the decision on accelerating the cultivation and development of strategic emerging industries, pointing out that the new generation of information technology has the potential of wide application across industries and fields; In December 2021, the Ministry of industry and information technology issued the "14th five year plan" for intelligent manufacturing development, emphasizing the deep integration of new generation information technology and advanced manufacturing technology as the main line, and focusing on improving the innovation ability, supply ability, support ability and application level of intelligent manufacturing engineering. In the field of high-end equipment, China has provided special financial support for high-end equipment manufacturing, especially aerospace, new energy vehicles, marine engineering equipment and other fields. In May 2015, the State Council issued "made in China 2025", which clearly proposed to strengthen the digital transformation of equipment manufacturing and promote the R&D and application of intelligent and green manufacturing technology. In the field of new energy, China focuses on supporting the coordinated development of industries through cross-border technology cooperation and infrastructure sharing. In December 2021, the Ministry of industry and information technology and other five departments jointly issued the action plan for innovation and development of intelligent photovoltaic industry (2021-2025) to promote the deep integration of photovoltaic industry and new generation information technology; In March, 2022, the national development and Reform Commission and the Ministry of energy jointly issued the medium and long term plan for the development of hydrogen energy industry (2021-2035), which proposed to orderly promote the diversified application of hydrogen energy, including transportation, industry and other fields, and explore the path of coordinated development of commercialization.

2. Antecedents of the Growth of Strategic Emerging Industries

2.1 Technical environment: digital infrastructure construction

Strategic emerging industries breed digital technology and are also embedded in digital infrastructure. The construction of digital infrastructure provides a "foundation" for the growth of strategic emerging industries. In recent years, countries have continuously strengthened the construction of digital infrastructure to build a "three-dimensional framework" for the development of digital economy (Sun Weizeng et al., 2023). Different countries have distinctive characteristics. (1) China is a "government led" digital infrastructure construction path. The construction of China's digital infrastructure is of a large scale, and it needs to adhere to the institutional essence of "focusing on major events". Specifically, China's digital infrastructure construction is led by the government, strengthening the main body coordination among the government, enterprises and social institutions, and continuously and intensively deploying new generation information technology, industrial Internet, 5g network, etc., so as to provide digital support for the growth of strategic emerging industries; At the same time, the government promotes the coordination among different regions of the East, central and West, and gives full play to the computing power advantage of the western region through "counting the East and calculating the west", so as to meet the development needs of strategic emerging industries in the eastern and central regions. (2) The United States is a "market led, government participation" digital infrastructure construction path. Unlike China, the construction of digital infrastructure in the United States presents a distinctive "public-private combination" feature of market dominance and government participation. At the market level, many commercial enterprises are "actors" in the construction of digital infrastructure. For example, SpaceX launched the "Starlink satellite chain project" to build a global satellite Internet network by launching a large number of low earth orbit satellites; Microsoft, Google, Amazon and other technology giants have helped build infrastructure such as data centers, cloud computing and artificial intelligence through a large amount of capital injection. At the government level, the U.S. government plays a "helper" role in the construction of digital infrastructure. For example, the White House helps cross sectoral cooperation and interaction by establishing a cross sectoral AI data center infrastructure working group; The U.S. government has reduced the barriers to 5g network construction of commercial enterprises by simplifying the licensing procedures for 5g infrastructure construction and limiting unreasonable government fees. In general, driven by the path of "market leading and government participation", the United States has taken the lead in the number and quality of digital infrastructure construction in the world, thus providing a high-quality technical basis for the growth of strategic emerging industries. (3) Germany is a "government led" digital infrastructure construction path. Guided by "industry 4.0", Germany clearly proposed to strengthen the construction of industrial Internet in strategic plans such as digital strategy 2025 and German industrial strategy 2030; In addition, the German government also emphasizes the protection of data. For example, the German Federal Ministry of Economic Affairs launched the "gaia-x" cloud platform project, with a view to ensuring Germany's autonomy and data security in the field of industrial Internet of things and cloud computing, and to meet

the domestic needs for Cloud Service information security through the construction of domestic big data centers. With the improvement of Germany's digital infrastructure construction, strategic emerging industries also benefit from it. (4) Japan is the "social traction" path of digital infrastructure construction. In order to cope with the social dilemma of population aging and labor shortage, Japan has strengthened the layout of digital infrastructure around "social needs". At the action level, Japan relies on digital technologies such as 5g network, Internet of things and artificial intelligence to build smart cities, smart health care and smart education. At the policy level, the Japanese government passed a bill in 2020 to support enterprises to develop secure 5g mobile networks. The bill clearly states that 15% of the base station construction investment of communication operators using supplier equipment that meets the Japanese government's security standards will be directly deducted from the corporate tax, or 30% of the investment will be included in the equipment depreciation to offset the tax payable; In addition, the Japanese government also provides low interest loans to enterprises that meet the network security standards through affiliated financial institutions, so as to improve the digital level of the whole society and create a good digital ecology for the development of strategic emerging industries.

2.2 Institutional environment: fiscal and tax incentive policies

Compared with traditional industries, strategic emerging industries often face more serious resource shortages, and their growth largely depends on the government's fiscal and tax incentive policies. Depending on their own institutional characteristics, different countries have formed the following fiscal and taxation policy designs: (1) China's fiscal and taxation incentive policy emphasizes the active allocation of resources and the guidance of industrial development to ensure that technological innovation is consistent with the national strategic objectives. Through the "14th five year plan for scientific and technological innovation" and the "national intelligent manufacturing development plan", the Chinese government provides all-round financial and tax support for emerging industries such as 5g, artificial intelligence and new energy. Among them, up to 75% of the R&D expenses plus deduction and 100% of the core technology R&D tax deduction directly promote enterprise innovation, reflecting the key role of the government in promoting technological breakthroughs (Huang Xianhai and Zhang Shengli, 2019). (2) The United States is a tax incentive policy combining pre support and post incentive. For strategic emerging industries in the early stage of entrepreneurship, the U.S. government mainly adopts preferential tax policies supported in advance, such as fee deduction and direct tax reduction, to stimulate start-ups in investment and increase technology investment; For strategic emerging industry enterprises that have entered mature development, the U.S. government focuses on the way of ex post encouragement to maintain their sustainable development. Each tax preference policy for emerging industries first sends a clear signal to the market, and then the market guides enterprises to invest in accordance with the direction of tax preference, thus forming an effective guidance mechanism of "policy regulating the market and market guiding enterprises" (Liu Guangqiang, 2017). (3) Germany prefers long-term and stable fiscal and tax incentives. Specifically, Germany's industry 4.0 strategy and its supporting future industries act show that the country is committed to helping SMEs achieve innovation in the core

technology field and gradually promote the optimization of industrial structure through stable tax incentives and R&D subsidies. Especially in the field of artificial intelligence and green technology, large-scale tax relief and R&D expenses deduction have been implemented for small and medium-sized enterprises, aiming to build a business environment conducive to long-term growth. (4) Japan pays attention to the supply of fiscal and tax policies for green industries. Japan attaches importance to the development of green industries, which is also reflected in the design of its fiscal and tax policies. For example, Japan's green growth strategy provides tax relief for industries such as hydrogen energy, batteries and wind energy, aiming to reduce the risk of enterprises entering the green technology field.

3. The Process Mechanism of the Growth of Strategic Emerging Industries

3.1 Internal mechanism: Innovation Driven Development

Strategic emerging industries, driven by scientific and technological innovation and guided by industrial upgrading, are the key to determining a country's industrial core competitiveness. Different countries have formed their own innovation driven development models according to their own industrial foundation, scientific research strength and policy environment. (1) China has actively practiced the combination of government and enterprises, continued to improve the innovation system with enterprises as the main body, market orientation, and deep integration of industry, University and research, and opened up a new path of integrated innovation. Through the establishment of numerous national and local scientific research institutions, high-tech industrial parks and technology transfer centers, China will give full play to the key role of centralized allocation of innovation resources and continue to promote the implementation and deepening of integrated innovation. The integrated innovation model puts more emphasis on the systematic competition of technology system, innovation system and innovation ecology, which is also the key to solve the "neck sticking" problem (xuguanhua, 2019). By establishing a systematic and long-term scientific and technological innovation thinking, it will help to give full play to the advantages of "focusing on major events" in the field of science and technology, and better realize the powerful combination of the government and the effective market. At the government level, the Chinese government has always emphasized strengthening organizational leadership and overall coordination, providing resources such as funds, systems, policies and platforms for technological innovation and application of digital technology enterprises, opening up the chain of basic research, application research, experimental development and industrial development, promoting the deep integration of industry, University, research and application, and the integration and innovation of large, medium and small enterprises, firmly mastering the autonomy of innovation and development of strategic emerging industries, and continuously opening up new fields and new tracks for development (Ma Jingzhou & Wu Xinmu, 2018); At the market level, a large number of state-owned enterprises, leading enterprises in science and technology, and specialized and special new enterprises actively participate in the collaborative research of industry, University and research with the innovation consortium as the starting point, use their technological advantages to actively feed back government governance, provide

technical support for the digitalization, intelligence and modernization of government governance, and form a two-way enabling innovation partnership. (2) The United States regards innovation driven development as the general program of strategic emerging industry policy, and actively promotes disruptive innovation with its strong venture capital system and capital market. In terms of policy, the United States has issued three consecutive versions of the American innovation strategy, which takes investing in innovation and creating a good innovation ecological environment as the cornerstone of the development of strategic emerging industries, and focuses on building an innovative network, an innovative government and a social environment to lay out the industrial chain, so as to stimulate technological innovation, transfer and promote regional innovation clusters (Ma Jingzhou & Wu Xinmu, 2018). Among them, the construction of innovation network is regarded as the key to realize national innovation and enhance national competitiveness (Wang Yuanyuan, 2017). Since the release of the revitalization of American manufacturing and innovation act 2014, the United States has successively established a number of research institutions such as the additive manufacturing Institute, and provided targeted R&D funds to support long-term basic research. It plans to build a national manufacturing innovation network including 45 manufacturing innovation institutes to promote the development of manufacturing clusters. In terms of market, according to the statistics of the National Science Foundation of the United States, from 2010 to 2022, the total R&D expenditure of the United States increased from about 390billion US dollars to more than 600billion US dollars, ranking first in the world, which directly promoted the breakthrough of basic science and Applied Technology in the United States. In 2022, the total amount of venture capital invested by the United States in science and technology enterprises in strategic emerging industries exceeded 150billion US dollars, of which about 40% went to emerging fields such as artificial intelligence, biotechnology and clean energy. At the same time, NASDAQ and other markets attracted a large number of scientific and technological innovation enterprises to go public for financing, further promoting the commercialization of new technologies and products. (3) Guided by the high-tech strategy, Germany continues to promote incremental innovation through the cultivation of the government, industry, University and research system, with particular emphasis on the innovative development of small and medium-sized scientific and technological enterprises. Under the framework of "industry 4.0", Germany has built a new innovation driven development mode of "German scientific research+German technology+German industry" with "industry as the guide and technology as the support", so as to continuously promote incremental innovation. Under this mode, Germany combines the country's economic development strategy, technological innovation and industrial reality by focusing on cultivating the innovation system of government, industry, University and research, making the system more long-term, practical and open. At the same time, the German government has also attached great importance to the construction of innovation networks, issued the agreement on scientific research and innovation and the joint plan for "research and innovation", and established a long-term and stable cooperative relationship with enterprises on R&D (Lu Tie & He Jun, 2013). For example, in order to achieve the goal of 1million new energy vehicles in Germany by 2020, the German government, through

the lithium battery innovation alliance, cooperates with BASF, Bosch, Evonik industries Lintec、Volkswagen's five corporate giants, as well as more than 60 institutions in universities and research institutes, promote the industrialization of lithium-ion battery technology to reduce the cost of new energy vehicles. In addition, Germany attaches particular importance to the innovative development of technology-based SMEs. According to the German Federal Ministry of economy and energy, about 70% of innovation activities in Germany in 2023 came from small and medium-sized enterprises. Germany has set up a special Bureau for small and medium-sized enterprises, issued laws and regulations such as the anti restrictive competition law and the law on the promotion of small and medium-sized enterprises to protect small and medium-sized enterprises, and also issued the important innovation plan for small and medium-sized enterprises to provide funding for technological innovation projects and scientific research plans of science and technology-based small and medium-sized enterprises. (4) With "industrial interconnection" as the strategic direction, Japan has formed an integrated cooperation mechanism of "government, industry and university" and continued to promote open innovation. Based on the strategic goal of building a new digital society, the Japanese government continues to promote open innovation driven development with "industrial interconnection" as the strategic direction. In order to better realize the vision of "industrial interconnection" and help enterprises realize "connected manufacturing", Japan has formed a mature multi-party cooperation support system, namely the "government industry university" integration cooperation mechanism. The Japan industrial value chain promotion association and the famous "industrial value chain reference framework" established with the support of the Ministry of economy and industry of Japan in 2015 are examples of the operation of this model. In this mode, the industry promotes the transformation of physical achievements by cooperating with universities and scientific research institutions to develop new technologies and products, while the government mainly plays the role of formulating relevant policies and building a platform environment, providing a good open innovation platform for enterprises to achieve transformation and upgrading (Liu Junmei & Xie Nishang, 2022). For example, in specific technical fields such as robotics and semiconductor technology, Japan has established a number of government industry university cooperation platforms to promote technological innovation and industrialization. Data show that the conversion rate of Japanese patent technology is as high as 80%, which is largely due to the "government industry university" integration cooperation mechanism (Han Xin, 2019).

3.2 External mechanism: International Development

In the context of global economic integration, the international development of strategic emerging industries is not only the key to enhance the industrial competitiveness of countries, but also an important means to occupy a dominant position in the global industrial chain. Countries promote the internationalization process of strategic emerging industries through different strategies and paths, and have formed their own distinctive models. (1) China's international development path shows the characteristics of "dual drive of policy and market, upgrading from labor-intensive to capital and technology intensive, and gradually rising to the high end of the industrial chain". In recent years, the

Chinese government has promoted the layout and development of strategic emerging industries in the global market through the combination of policy guidance and market mechanism. On the one hand, the government has issued a number of policies to support enterprises to "bring in" and "go out", encouraging enterprises to enhance their international competitiveness through overseas mergers and acquisitions, technology introduction and other means. For example, in 2024, Chinese enterprises in the new energy vehicle industry chain accelerated their overseas layout, and promoted the internationalization of technology and production capacity by investing and building factories in Morocco, Spain, Slovakia and other places. On the other hand, driven by the market, Chinese enterprises are actively transforming from traditional labor-intensive industries to capital and technology intensive industries. In 2024, in the case of cross-border M&A of Chinese enterprises, advanced manufacturing, TMT (technology, media and communication) and medical and life sciences have become hot fields, showing that the pace of internationalization of capital and technology intensive industries has accelerated. For example, Changfei optical fiber strengthened its international layout in the field of communication infrastructure by acquiring RFs subsidiaries in Germany and Suzhou; Ganfeng lithium consolidated its competitiveness in the global lithium resource market by acquiring lithium projects in Africa. (2) The United States is an international development path of "leading by scientific and technological innovation, consolidating its high-end position by relying on technological advantages and standard setting power, and leading the layout of the global industrial chain". With its strong strength in basic research and cutting-edge technology, the United States has rapidly deployed its industrial chain worldwide through cross-border mergers and acquisitions, foreign direct investment and other means. In May, 2023, the United States issued the national standards strategy for key and emerging technologies, emphasizing the strengthening of public-private cooperation, promoting the formulation of key and emerging technology standards, and ensuring that these standards reflect market demand and technological progress. In this context, Qualcomm, an American enterprise, has formed a solid technical barrier by embedding patents into standards, and its patent licensing revenue has become an important source of profit. In addition, the United States consolidates its industrial chain layout through international cooperation and multilateral mechanisms. For example, the United States has established a "trade and Technology Council" with allies such as the European Union and Japan to strengthen cooperation in key areas such as artificial intelligence, quantum technology and semiconductor technology, forming an efficient coordination mechanism. At the same time, the United States actively promotes the decentralization of the supply chain, reduces dependence on emerging countries, and ensures control of key industries through mechanisms such as the Indo Pacific Economic Framework and the "chip Quartet". (3) Germany's international development path takes manufacturing as the core, relies on a strong industrial foundation, and consolidates its high-end position in the global market through the formulation of international standards and the deep integration of industrial chains. Through the "industry 4.0" strategy, Germany has deeply integrated digital and intelligent technologies with traditional manufacturing, and built a personalized and networked industrial chain. It not only has international competitive advantages in

production and R&D bases, but also has become an important provider of global intelligent manufacturing system solutions (Meng Qi, 2013; Gao Shan, 2017). Germany also promotes international standardization cooperation through the "industry 4.0 platform" to further consolidate its position in the global industrial chain. For example, institutions such as the German Institute for Standardization (DIN) and the German Institute of Electrical Engineers (VDE) play an important role in the global standardization work to ensure that German standards become international standards. In addition, Germany pays attention to the in-depth integration of the industrial chain. In the first half of 2024, Germany's total direct investment in China reached 7.3 billion euros, showing the strong momentum of German enterprises' investment in China. At the same time, German enterprises expand other Asian markets such as India and Vietnam through the "China+1" strategy to disperse supply chain risks. (4) Japan's international development path is characterized by "close collaboration between the government and enterprises, through a multi-level policy support system, and through technical cooperation and overseas investment to achieve international expansion". Through a series of policy support and strategic planning, the Japanese government has provided a solid guarantee for enterprises to "go global". In terms of technical cooperation, the Japanese government has actively promoted enterprises to establish cooperative relations with global scientific research institutions and enterprises, and accelerated technology transfer and industrialization. In November 2022, the Japanese government launched the "global innovation and Entrepreneurship Program", which aims to promote the joint research and development of emerging cutting-edge technologies such as artificial intelligence and quantum computing through cooperation with scientific research institutions in major economies such as Europe, America and Asia. In terms of overseas investment, the Japanese government has established a multi-level support system to promote the layout of enterprises in the global market. In August 2022, Japan officially established the "overseas business investment support office" (GBIS), which is responsible for formulating the overall strategy of overseas investment. In addition, the Japanese government has also eased the financial constraints of SMEs' international business through a multi-level financing and insurance support system. For example, Japan's policy finance public treasury provides low interest loans and financing guarantees for small and medium-sized enterprises to support their long-term overseas operations. This multi-level support system has not only enhanced the international competitiveness of Japanese enterprises, but also consolidated their position in the global industrial chain.

4. Research Conclusion

The growth of strategic emerging industries does not follow a single path, but a multiple evolution process formed in the specific institutional environment, technological foundation and development needs of various countries. Understanding this diversity and adaptability has important theoretical enlightenment and practical reference value for grasping the internal law of emerging industry development and optimizing industrial policy design.

First, the growth of strategic emerging industries has a significant country context dependence, and the

industrial layout mode is deeply compatible with the resource endowment, institutional tradition and development strategy of various countries. The "multi habitat" layout of the United States relies on its strong R&D strength and market perception, and makes synchronous efforts in many frontier fields such as new energy, new generation information technology, and biomedicine; Germany's "sophisticated" pattern is rooted in its profound industrial foundation and technological accumulation, focusing on high-end manufacturing and cutting-edge technological breakthroughs; Japan's "refined" development stems from the basic national conditions of resource constraints and technological innovation, and intensive cultivation in the fields of new energy, new materials, and information technology applications; China's "coordinated" development is reflected in the promotion of the deep integration and cross domain collaboration between the new generation of information technology and traditional industries based on the advantages of the super large-scale market and the ability of institutional coordination.

Second, the path difference of digital infrastructure construction has a profound impact on the underlying technology support ability of strategic emerging industries. The study found that the four countries have formed four typical construction modes: China's "government led" mode relies on institutional advantages to achieve large-scale deployment and regional coordination; The mode of "market leading and government participating" in the United States gives full play to the vitality of enterprises and the efficiency of capital allocation; The "government led" model in Germany emphasizes the dual goals of industrial Internet and data security; Japan's "social traction" model precisely lays out digital infrastructure around social needs such as aging and labor shortage. These differentiated construction paths have shaped the technological basis and ecological conditions for the growth of strategic emerging industries in various countries.

Third, the design logic of fiscal and tax incentive policies reflects the way and boundary of a country's government's intervention in the market, and then affects the path choice of industrial growth. China's fiscal and taxation policies emphasize the active allocation of resources and strategic guidance to ensure the synergy between technological innovation and national goals; The policy design of the United States follows the logic of "policy controls the market, and the market guides enterprises", forming an organic link between pre support and post incentive; Germany prefers a long-term and stable fiscal and tax support mechanism to provide sustainable impetus for technological innovation of small and medium-sized enterprises; Japan focuses on the field of green industry and reduces the risk of enterprises entering the field of emerging technologies through precise tax relief.

Fourth, the differences in innovation driven development patterns determine the technological path and competitive potential of strategic emerging industries. Relying on the combination of government and enterprises and the deep integration of industry, University and research, China has opened up the development path of integrated innovation and effectively integrated innovation resources to crack the bottleneck of key technologies; With its strong venture capital system and capital market, the United States continues to promote disruptive innovation and occupy the global technological frontier and standard commanding heights; Guided by the high-tech strategy, Germany promotes incremental

innovation by cultivating a collaborative system of government, industry, University and research, especially focusing on the innovation vitality of small and medium-sized science and technology enterprises; Japan takes "industrial interconnection" as the strategic direction, and relies on the "government industry university" integration cooperation mechanism to promote open innovation and realize the efficient transformation of technological innovation and industrialization.

Fifth, the choice of internationalization development path is closely related to the industrial foundation, technological advantages and institutional support system of various countries. China has embarked on an international road driven by both policy and market, upgrading from labor-intensive to capital and technology intensive, and gradually rising to the high end of the industrial chain; The United States relies on its technological advantages and standard setting power to dominate the layout of the global industrial chain and consolidate its high-end position through technical barriers and multilateral mechanisms; With manufacturing as the core, Germany maintains its high-end advantage in the global intelligent manufacturing field through the deep integration of international standard setting and industrial chain; Japan relies on government enterprise coordination and multi-level policy support system to achieve steady international expansion through technical cooperation and overseas investment.

References

Bai Peiwen, & Yu Li. (2021). digital economy development and enterprise price markup: theoretical mechanism and empirical facts. *China industrial economy*, *2021*(11).

Cao Jianing. (2019). The experience and Enlightenment of developing strategic emerging industries in Germany Economic Research Guide, 2019(16).

Han Xin. (2019). advanced development of industrial foundation towards high quality. *People's daily*, August 30, 2019.

Li Xiaoyan, & Bao Mingqi. (2020). Research on the strategy of deepening cooperation in emerging industries under the new manufacturing strategy between China and Germany Foreign economic and trade practice, 2020(02).

Lu Tie, & He Jun. (2013). Collaborative transformation of technological economy paradigm and policy reconstruction of strategic emerging industries. *Academic monthly*, *2013*(7), 78-89.

Ma Jingzhou, & Wu Xinmu. (2018). International Comparative Study on the policies of strategic emerging industries -- Based on the comparison of China, the United States, Germany and Japan. *Henan Social Sciences*, *26*(04).

Sheng Chaoxun. (2016). New trends and Enlightenment of emerging industry policies in developed countries. *Economic review*, *2016*(11), 76-81.

Wang Zhiwei, Xu Youzhi, & Dong Yaqiu. (2019). How the United States, Britain and Germany arrange emerging industries. *China investment* (Chinese and English), *2019*(17).

Xu Guanhua. (2019). A review of the development of science and technology in China and some suggestions, 2019(10), 1096-1103.

Zhu Yingchun. (2011). The role of government in strategic emerging industries. *China Science and Technology Forum*, *2011*(1), 20-24.