

WORKING PAPER

Facilitating Modernization of China's Industrial and Supply Chains and Advancing Optimization and Upgrade of Its Economic System

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In the “Communist Party of China Central Committee’s proposals for formulating the 14th Five-Year Plan (2021-2025) for National Economic and Social Development and the Long-Range Objectives Through the Year 2035”, to accelerate the development of modern industrial system and to advance economic optimization and upgrade are listed as the second key task of economic and social development and reform and opening up policy during the 14th five-year plan. Its core requirement of the task is to persist in taking the real economy as the focus of its economic development, to unswervingly build up its strength in manufacturing, quality and cyberspace and build a digital country, to advance its industrial foundation to a higher level and promote the modernization of its industrial chain, and to improve the quality, efficiency and core competitiveness of its economy. The specific tasks include five aspects: to facilitate modernization of its industrial and supply chains, to boost the development of strategic emerging industries, to accelerate the development of modern service industries, to advance infrastructure construction in a coordinated way, and to accelerate digital development. This article mainly focuses on how to understand about facilitating the modernization level of industrial and supply chains, which is the primary task of developing a modern industrial system and advancing economic optimization and upgrade.

I. Significance of facilitating modernization of the industrial and supply chains

In recent years, in the face of Sino-US trade frictions and the impact of coronavirus pandemic, industrial and supply chains and their security issues have received increasing attention from the Chinese central government, and the term ‘industrial and supply chains’ has been constantly mentioned in the official documents of the central leadership. The 2018 Central Economic Work Conference proposed to deepen the supply-side structural reforms (SSSRs) based on the policy of “consolidation, enhancement, improvement and smoothness”, and the

main task of the SSSRs is “to cut overcapacity, reduce excess inventory, deleverage, lower costs, and strengthen areas of weakness”. The Conference requires to strengthen the vitality of micro entities, improve the level of the industrial chains and smooth the circulation of the national economy. This is the first time that the Central Economic Work Conference has requested an improvement in the level of the industrial chains. On July 30, 2019, the Political Bureau meeting of the Central Committee of the CPC once again emphasized that the supply-side structural reforms should be deepened and that the basic industrial capacity and the level of the industrial chains should be improved. The Central Economic Work Conference, held on December 10, 2019, further clarified the requirements for improving the basic industrial capabilities and the modernization level of the industrial chains.

How to understand the level of industrial and supply chains? From the perspective of economics, value is the core. Thus, to understand the industrial and supply chains must start from understanding the value chains, which have determinant impact on the industrial and supply chains. The description of the value chains focuses on describing the chain-like relationship and distribution of different value links from the perspective of value-added production; the industrial chains are expressed as the chain-like relationship and distribution in time and space between enterprises or entities, which are distributed according to the value chains. The supply chains refer to the chain-like relationship and the distribution in time and space between enterprises or entities, which are described from the perspective of logistics corresponding to the value chain. It can be seen that the industrial and supply chains are an extension of different angles based on the value chain theory. It can be said that the industrial chain covers the entire process of product production or service provision and is the unity of industrial organization, production process and value realization. Supply chain is the dynamic realization of industrial chain logistics, while value chain is the value realization of industrial and supply chains. Based on such an understanding, facilitating modernization of the national industrial and supply chains refers to the process that the country concerned extends its industrial and supply chains towards high added value, strengthens the value-added capabilities of its industries in all phases of global value chains and achieves an upgrade of its place in the global value chains.

It is of great significance to improve the modernization level of the country’s industrial and supply chains during the “14th Five-Year Plan” period. This issue cannot be simply understood as a general issue at the meso level or even micro level, as it is also a major issue with macroscopic significance. First, to improve the modernization level of the industrial and supply chains is vital to constructing a modern economic system and promoting high-quality

development, and it will exert direct impact on whether a prosperous and powerful socialist modern country can be built. A modern country needs the support of a modern economic system, and the most important thing in a modern economic system is a modern industrial system composed of a series of high value-added industrial and supply chains. Therefore, through improving innovation capabilities, pushing forward the development of industrial and supply chains to high value-added industrial and supply chains, and promoting the modernization of industrial chains and supply chains, China will be able to accelerate the construction of a modernized industrial system with innovation-led and coordinated development of the real economy, technological innovation, modern finance and human resources, which is essential for high-quality economic development and achievement of the centenary goals. Second, to improve the modernization level of the industrial and supply chains is also an important measure for China to respond to major changes and to ensure the country's economic security. Due to the global financial crisis, especially the Sino-US trade frictions and the coronavirus pandemic, China's industrial and supply chains are facing huge challenges. The risk of disrupting and relocating industrial chains is continuously increasing, and industrial security issue has become more and more challenging. In the era of the division of labor in the global value chains, the modernization level of a country or region's industrial and supply chains is mainly reflected in the general status that the country and region's enterprises have in the industrial division of the global value chains on the one hand and in the governance capacity and control ability they have in building the global value chains on the other hand. Although the overall scale of China's industry is huge and it is already the world's largest manufacturing country, the modernization level of China's industrial and supply chains is relatively low, at the middle and low level of the division of the global value chains, and its governance capacity for the global value chains is relatively low. Against the backdrop of globalization countercurrents, unilateralism and protectionist trends, a series of "bottleneck" problems have become increasingly prominent, which becomes a key impediment to the country's industrial security. President Xi Jinping proposed to coordinate the relationship between security and development. Security is the prerequisite for development, and development is the guarantee of security. That is to say, without upgrading the modernization level of the industrial and supply chains, industry security cannot be truly guaranteed, and thus the overall national security cannot be guaranteed. Third, to modernize the industrial and supply chains is also an inevitable need for building a complete domestic demand system and for forming a domestic cycle as the main body and mutual promotion of domestic and international double cycles. From the perspective of the production, circulation, distribution, consumption and other main links of the economic cycle, one of the main manifestations of the current poor economic cycle in China is that technological

innovation and industrial innovation capabilities need to be further improved, and the level of modernization of the industrial and supply chains is not high, which results in relatively low quality in industrial supply and cannot effectively meet the consumer's needs for the transformation and upgrade of consumer products. As a result, the dynamic matching between production and consumption as well as between supply and demand cannot be well achieved. Therefore, in order to smooth the domestic major cycle and form a development pattern that promotes the mutual promotion of the domestic and international double cycles, it is necessary to improve the basic industrial capacity and the modernization level of the industrial chains, so as to improve the quality of supply and open up the blockage of the national economic cycle.

II. Key Issues Restricting Modernization of the Industrial and Supply Chains

Seen from the overall assessment of China's industrial and supply chains, both its advantages and disadvantages are quite obvious. The outstanding advantage is that the total industrial volume is super large and the supporting system is complete. Since 2010, the added value of China's manufacturing industry has been the number one in the world. In 2016, the added value of China's manufacturing industry was equal to the sum of the added value of the US and Japan, which ranks in the second and third place respectively. Moreover, China has strong industrial supporting capabilities. In the United Nations industrial catalog, China is the only country with manufacturing capabilities in all industrial categories. However, the problem of China's industrial and supply chains is also obvious. Namely, China's industrial base is weak, the capacity of its industrial base is low, and consequentially the imbalance in the industrial structure of excess low-end industries and insufficient high-end industries is quite serious. The low capacity of China's industrial base is the most critical issue restricting modernization of the country's industrial and supply chains.

Generally speaking, the capacity of industrial base can be expressed as the guarantee conditions and comprehensive strength of the basic support for the industrial formation and development in a country or region, especially the R&D and production conditions and strengths of basal spare parts (components), foundation crafts, basic materials, basic technologies, underlying drivers, basic infrastructure and so forth. In a broader connotation, the capacity of industrial base also includes the National Quality Infrastructure (NQI) (measurement, standards, certification, inspection and testing), supporting capabilities, institutional environment, hardware infrastructure and other aspects. From the perspective of global value chains, this kind of industrial base capability refers to the basic conditions and strength that a country has to support its industries to participate in and construct global value

chains specialization. The so-called advancement of industrial base capabilities is a process of raising the level of industrial base capabilities from low to high and of enhancing the basic conditions and strength of the industrial value chains. Since the reform and opening up, under the guidance of the low-cost export-oriented and rapid industrialization strategy aimed at catching up and surpassing, China rapidly promoted the process of industrialization, became an important participant in the global value chains specialization, a major country in the network of the global value chains and the largest supplier of intermediate goods, and plays a pivotal role in the global value chains. However, the industrial base is still relatively weak, and there is a big gap between China's industrial base capacity and that of the industrialized countries. Take the "four bases of industry" as an example, in the advanced manufacturing fields, such as information technology, data machine tools and robots, aerospace equipment, marine engineering equipment and high-tech ships, advanced rail transit, energy-saving and new energy vehicles, power equipment, agricultural equipment, new materials, biomedicines, and high-performance medical devices, the basic industries where China expected to make breakthroughs between 2016 to 2020 include 287 industries in terms of core basic components (components), 268 industries relating to key basic raw materials, 81 industries regarding advanced foundation crafts, 46 industries regarding technical foundations, totaling 682 industries.

In fact, China's industrial base capabilities are compatible with the rapid growth of its development model. The rapid growth development model relies more on the comparative advantages of the huge market scale, the technological sources of late-starting imitative innovation, and the low-cost supply of development elements. China's rapid economic development benefits from this development model, but it inevitably leads to the problem of a weak industrial base. As the late-starting catching-up path has a self-reinforcing "lock-in effect", it is necessary to break the original economic development path in order to enhance the industrial base capacity and adapt to the economic transition from high-speed growth to high-quality development. This requires to "regenerate" industrial base capacity, to shift from focusing on applied research to more on basic research, from emphasizing imitative innovation to more emphasizing original innovation, and from encouraging iterative technological innovation to more encouraging disruptive technological innovation. In other words, the modern economic system built during the high-quality development stage needs to be supported by a new industrial base, so it's necessary to regenerate industrial base. Therefore, since 2019, the central government has not only listed it as an important task of constructing modern industrial system to promote the advancement of the industrial base and the modernization of

the industrial chains, but also proposed to vigorously implement the industrial regeneration projects. The “14th Five-Year Plan” has further emphasized the promotion of advancing industrial base, modernizing industrial chains and implementing industrial regeneration projects.

III. Policy Foci on Modernizing Industrial and Supply Chains

It is undoubtedly a complex and long-term arduous task to improve the advancement of the industrial base and the modernization of the industrial and supply chains. The proposals of the “14th Five-Year Plan”, in response to the specific problems in reality, adhere to the combination of goal orientation and problem orientation and recommend to build industrial and supply chains that are more innovative, higher value-added, secure and reliable. There are some specific requirements. The first is to curb the trend of being “off the real to the imaginary” of the “demanufacturing” and to maintain a basically stable proportion of the manufacturing industry so as to consolidate and strengthen the foundation of the real economy; the second requirement, against a backdrop of the impact of the coronavirus pandemic on China’s industrial and supply chains and industrial security issues, requires to stick to independence, controllability, safety and efficiency, to design supply chain strategies and precisely implement policies based upon different industries, to promote the optimization and upgrading of the entire industrial chains, to promote the diversification of the industrial and supply chains, and to strengthen international cooperation on industrial security; the third is to point out the direction of modernizing the industrial and supply chains, which means, on a basis of China’s industrial scale advantages, supporting advantages and first-mover advantages in some fields, to foster emerging industrial chains, to push the high-end, smart and green development of the traditional industries, and to boost service-oriented manufacturing; the fourth requirement, in response to the weak links in the industrial and supply chains, such as the weak industrial base capacity, puts stress on implementing industrial regeneration projects, improving national quality infrastructure, optimizing the development environment of the industrial and supply chains, enhancing research on key products and key core technologies, developing advanced and applicable technologies, strengthening factor support, reinforcing system and capacity building, such as standards, measurement, patents and so forth, and carrying out in-depth quality improvement actions; and the fifth requirement, in response to the coordination issue of China’s economic regions and from the perspective of regional layout, recommends to promote the orderly transfer of industries within the country, to optimize the layout of regional industrial chains, and to support the transformation and development of the old industrial bases.

Without doubts, it is a complicated and systematic project to realize the above-mentioned tasks and requirements, and it is necessary to focus at least on the following four policy aspects.

The first policy aspect is to build an innovation ecosystem that is conducive to improving the modernization of the industrial and supply chains. First of all, great importance needs to be attached to basic research and research on common technologies, forward-looking technologies and strategic technologies; second, efforts needs to be made to improve basic service systems, such as test verification, measurement, standards, inspection and testing, certification, and information services; third, it's important to build an industrial innovation network, to improve the openness and synergy of the innovation ecosystem, and to build a socially coordinated system and mechanism; fourth, efforts need to be made to continuously improve the innovation "ecological niche" of SMEs via improving the environment, and to effectively play the role of SMEs in improving the industrial base capabilities and the level of the industrial chains; fifth, it's necessary to give full play to the advantages of the country's new nationwide system on the basis of continuous improvement of the new nationwide system, and to tackle major, strategic, and fundamental technical issues that are difficult for market players to overcome with huge investment, high technical difficulty. The nationwide system must achieve "nationwide investment" in terms of "resource investment" and, more importantly, "nationwide coordination" in terms of "organization and management" (i.e., cross-departmental coordination and cross-regional coordination).

The second policy aspect is to give full play to the fundamental role of competition policy in improving the level of the industrial and supply chains. As a whole, China is in a period of transition from the late industrialization to the post-industrialization and of starting high-quality industrialization. The industrial structure is becoming more and more complete, and the industrial technology level is gradually approaching the global technological frontier. The dominant policy system that has been compatible with the selective industrial policy at the early and middle stages of China's industrialization, is becoming more and more inapplicable, and industrial policy resources should be directed more toward the construction of a science and technology service system. Meanwhile, competition policies will increasingly play a fundamental role. In addition, it is necessary to cultivate and stimulate disruptive technological innovation by establishing the base status of competition policy.

The third policy aspect is to deepen the implementation of industrial regeneration projects. During the "14th Five-Year Plan" period, a series of effective policy measures should be made to improve the industrial base capabilities. To begin with, it's important to firmly implement the industrial regeneration projects, to accomplish the work of top tier designing, to

clarify the project focus, to organize implementation by classification, and to provide policy guidance for the construction of the industrial infrastructure system; the second policy measure is to establish an evaluation system for industrial base, to accurately position and evaluate the status quo of China's industrial and supply chains and key technologies, and to analyze the distribution of innovation chain, supply chain, industrial chain and value chain; the third policy measure is to learn from Japan's "mother factory" system to build a core factory for rebuilding industrial base capabilities, and to focus on the integrated elements of the "four industrial bases" at the manufacturing level, optimize processes and cultivate talents, so as to improve China's industrial base capabilities through professional integration and long-term contributions; the fourth measure is to strengthen the construction of the basic research and development system for common technologies, and consider adopting a differentiated organization forms based on the characteristics of different common technologies, including adopting special projects of the national plan, establishing public scientific research institutes, such as the National Industrial Base Research Institute and the National Industrial Technology Research Institute, and the government taking the lead to form joint research bodies or industrial technology alliances for joint development among government, enterprises, universities and research institutes.

The fourth policy aspect is to gradually explore ways to improve the level of the industrial chains that are suitable for different enterprises to expand to high value-added links. From the perspective of corporate growth strategy, efforts should be made to distinguish different ways to improve the modernization of the industrial and supply chains, and to improve the division of labor status and control ability of Chinese companies in the global value chains via a targeted manner. The types of companies based on the governance of the industries in the global value chains can be divided into three categories: producer-driven path, buyer-driven path, and "hidden champion" driving path. In doing so, the modernization of China's industrial and supply chains can be improved. The producer-driven path, mainly aimed at large-scale manufacturers, strengthens its position in the global value chains by increasing R&D investment and cultivating core technologies. Buyer-driven path mainly requires companies to promote the added value of the industrial and supply chains by leveraging China's super-large-scale market advantages and creating their own service brands. The "hidden champion" driving path, aimed at outstanding small and medium-sized enterprises, promotes the added value through the single product/service market that tends to be centralized and specialized.

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