

Current Chinese Economic Report Series

Jianhua Xiao · Xiaofan Wu ·  
Bing Lian Liu · Ling Wang · Fan Qin

# Contemporary Logistics in China

Revitalization Amidst the COVID-19  
Pandemic

 Springer

# **Current Chinese Economic Report Series**

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# Chapter 1

## China's Logistics Development Under the New Development Paradigm: A Strong Sense of Responsibility and a New Direction



Ling Wang

The Fifth Plenary Session of the 19th Central Committee of the Communist Party of China (CPC) clearly proposed to “accelerate the fostering of a new development paradigm where domestic and foreign markets can reinforce each other, with the domestic market acting as the mainstay.”<sup>1</sup> As a fundamental, strategic, and pioneering industry of the national economy, logistics connects productivity, distribution, circulation, and consumption, and is an important support and guarantee for opening up supply chains, coordinating industry chains, creating value chains, and building a “dual circulation” development paradigm. This new development paradigm will guide China’s logistics industry toward high-quality development and help create a modern logistics system, thus inaugurating a new era when China can become a major logistics power.

This chapter consists of three sections. Section 1.1 analyzes the background, significance, and connotation of the new development paradigm. Section 1.2 analyzes the roles of China’s logistics under the new development paradigm in five areas: supporting a strong domestic market, promoting a higher level of opening-up, facilitating a modern circulation system, taking the lead in innovative technology application, and deepening reform of the logistics field to promote high-quality growth. Section 1.3 envisages China’s logistics under the new development paradigm in six areas: expanding domestic demand as strategic underpinning, promoting higher-level opening up of logistics, setting up a modern logistics infrastructure system, fostering innovation that leads to high-quality logistics development, improving logistics costs and quality (lower costs, improved quality and efficiency), and strengthening the security capacity of the industry and supply chains.

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<sup>1</sup> According to the criteria standards used to classify economic activities of production, distribution, exchange and consumption, the so-called “domestic circulation” means that the above-mentioned stages are completed within the country, i.e. the connection and matching of production and consumption (supply and demand) are mainly completed within the country, thus forming a stable industrial and economic structure. In contrast, the so-called “international circulation” is an economic model where the nodes of the above-mentioned stages are partially located abroad.

## **1.1 The Background, Significance and Connotation of the New Development Paradigm**

A major strategic decision made by the Chinese government to adapt to the changes in China's development stage, environment, and conditions is accelerating the construction of a new development paradigm where domestic and foreign markets can reinforce each other, with the domestic market acting as the mainstay. It will be an extremely important guiding principle for China's development during and after the 14th Five-Year Plan period. A better understanding of the background and basic connotations of the new development paradigm will help spur China's economic and social development, build a modern logistics system, and achieve high-quality logistics development.

### ***1.1.1 The Background of the Proposed New Development Paradigm***

Our world is undergoing momentous changes unseen in over a century, and the COVID-19 pandemic is accelerating such changes. Protectionism and unilateralism are on the rise, the world economy is in the doldrums, and the global supply chain is facing shocks due to non-economic factors. The international economic, technological, cultural, security, and political landscapes are undergoing intensive restructuring, as the world enters a period of turbulence and change. Concurrently, China's domestic development environment is also undergoing profound changes, and the Chinese people are increasingly demanding a better life. In face of such momentous changes, the fostering of a new development paradigm is in accordance with the changes in China's development stage, environment, and conditions, and is a strategic decision made by China to reshape its international cooperation and develop a new competitive edge.

On April 10, 2020, the 7th Meeting of the Central Financial and Economic Affairs Commission of the CPC Central Committee first mentioned the "new development paradigm", pointing out that a smooth domestic circulation is "conducive in building a new development paradigm where domestic and foreign markets reinforce each other, with the domestic market acting as the mainstay". The Standing Committee of the Political Bureau of the CPC Central Committee held a meeting on May 14, 2020, and proposed that "we should fully leverage the massive Chinese market and boost domestic demand to build a new development paradigm, with mutually reinforcing domestic and international dual circulation". The Political Bureau of the CPC Central Committee conducted a further meeting on July 30, 2020, emphasizing the necessity to "accelerate the formation of a new development paradigm where domestic and foreign markets can reinforce each other, with the domestic market acting as the mainstay". Since then, at the 15th Meeting of the Central Committee for Deepening Overall Reform, the 8th Meeting of the Central Financial and Economic Affairs

Commission of the CPC Central Committee, and other important meetings, “accelerating the construction of a new development paradigm” has been an important priority. On October 29, 2020, the Fifth Plenary Session of the 19th CPC Central Committee adopted the “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”, clearly proposing to “accelerate the construction of a new development paradigm where domestic and foreign markets reinforce each other, with the domestic market acting as the mainstay”.

### ***1.1.2 The Great Significance of Building a New Development Paradigm***

#### **1.1.2.1 Building a New Development Paradigm is an Urgent Need for China to Enter a New Development Stage**

In the early stages of China’s “reform and opening up”, domestic capital and technology were severely lacking, but labor was abundant and cheap, and its economy was highly complementary to that of developed countries. In the context of economic globalization, China was introduced to advanced technology and management skills by opening up to the outside world and developing its processing trade, rapidly catching up economically and creating a “world factory” development model with markets and resources “on the outside”. However, with the profound changes in labor, land, market, and other resource endowments, and increasing constraints on the resource environment, the original growth model that relied mainly on factor inputs, external demand, investment, and scale expansion is unsustainable. Hence, China is in urgent need of restructuring. The report of the 19th CPC National Congress clearly pointed out that China’s economy has been transitioning from a phase of rapid growth to a stage of high-quality development. Based on this new development stage, the potential of domestic demand is constantly being released, and domestic circulation increasingly strengthened. Hence, ensuring smooth domestic circulation could realize China’s high-quality development in response to the urgent need for economic restructuring.

#### **1.1.2.2 Building a New Development Paradigm is China’s Strategic Decision to Cope with Changes in the Internal and External Environments**

On an international level, the instabilities and uncertainties of the world economy have increased significantly, and the international development environment has

become increasingly complex. The next stage of technological revolution and industrial transformation is gathering pace, promoting the deep integration of manufacturing and service industries, and resulting in a precipitous change in the production paradigm. The engine for global economic growth is gradually taking shape. At the same time, there have been profound adjustments in the international power situation, i.e., there are more complex interactions among major powers, with new emerging markets and developing countries rising as a collective group, thus rendering the multipolarity of the global economic landscape more obvious. In addition, economic globalization has run up against headwinds, i.e., the momentum of traditional international economic circulation has weakened significantly, as the global industry chains and supply chains shift toward localization, regionalization, and decentralization. At the domestic level, China's uneven and insufficient development remains a clear problem. First, it still needs to carry out arduous reform in many key areas and links. Second, its innovation capabilities have not yet adapted to the requirements of high-quality development. Third, it does not have a solid enough agricultural foundation. Fourth, there is a large urban and rural development and income distribution gap. Fifth, there is still a long way to go in its ecological and environmental conservation. Sixth, it still cannot meet the livelihood needs of its people. In the face of changes in the internal and external development environments, China must scientifically coordinate between development and security, focusing on opening up large domestic circulation, and enhancing the mutually reinforcing domestic and international interplay within the dual circulation, in order to participate more actively in international cooperation and competition.

### **1.1.2.3 Building a New Development Paradigm is an Inherent Requirement to Adapt to China's Changing Development Conditions**

China's economy is progressing steadily and looking favorable in the long run, while its development foundations have become more solid, so it is in an ideal position to realize large domestic circulation and promote domestic and international "dual circulation". First, the country's socialist system has an extraordinary ability to organize, mobilize, coordinate and implement. Second, China has rich material resources, with an enhanced and guaranteed supply capacity. It has become the world's second-largest economy, the largest manufacturing country, and second-largest consumer nation of goods. It has the largest inflow of foreign capital, the world's largest and most complete industrial system, a strong production capacity, with fully functional support capability, and vast human resources. Third, it has a massive market and huge potential for domestic demand. China is the world's most populous country, with the largest middle-income group that continues to grow. Moreover, its consumer market is ever-expanding, its consumption structure continuing to optimize and adjust, making consumption the key impetus for economic growth. In addition, the rapid development of new industrialization, informatization, urbanization, and agricultural modernization could potentially attract much investment. Hence, the advantages of

China's mega-market and its domestic demand in supporting and boosting economic growth are becoming prominent. Fourth, regional coordination and the resilience of regional development have been enhanced. The Belt and Road Initiative has become widespread, achieving concrete results. The four major regions of Eastern, Central, Western, and Northeastern China have maintained benign regional interaction: the coordinated development of the Beijing–Tianjin–Hebei region, the development of the Yangtze River Economic Belt, the construction of the Guangdong–Hong Kong–Macao Greater Bay Area, the integrated development of the Yangtze River Delta, the ecological conservation and high-quality development of the Yellow River Basin, and other major regional development strategies are steadily being advanced, expanding the strategic maneuver room for national development. At present, China has entered a new stage of development, as it consolidates its foundation and refines its conditions for large domestic circulation. Thus, it must actively adapt to changes in the development foundation and conditions, and accelerate the building of a new development paradigm.

### ***1.1.3 Interpreting the New Development Paradigm***

#### **1.1.3.1 Expanding Domestic Demand is the Strategic Underpinning for Building a New Development Paradigm**

The Fifth Plenary Session of the 19th CPC Central Committee clearly proposed to “create a strong domestic market and foster a new development paradigm; expand domestic demand as a strategic underpinning and accelerate the establishment of a complete domestic demand system”. Expanding domestic demand is a powerful safeguard for forestalling and resolving major risks, ensuring quick responses to major public security emergencies. It is also an effective way to maintain the healthy and sustainable growth of China's economy in the complex and profound internal and external environments. It is, moreover, a necessity to meet the people's growing needs for a better life.

The new development paradigm should focus firmly on supply-side structural reform, while paying attention to demand-side management, and grasping the strategic underpinning of expanding domestic demand in both demand and supply. On the one hand, the strategy of expanding domestic demand should be organically integrated with deepening structural reform on the supply side. By relying on its mega-market advantage, China should be able to optimize the supply structure, improve supply quality, precisely grasp the rising, multi-level and diversified consumer demand, and generate new demand with innovation-driven development and high-quality products and services. On the other hand, it should effectively integrate consumption and investment. Consumption is an important engine in driving the economy. China should boost traditional consumption, cultivate new types of consumption, and increase public consumption as appropriate. Investment demand is an important component in building a complete domestic demand system. China

should promote new infrastructure construction,<sup>2</sup> major national and engineering projects, and strategic investment in new infrastructure and high-tech industries in order to expand its scope for investment.

### **1.1.3.2 A High Degree of External Openness is a Powerful Driving Force for Building the New Development Paradigm**

The Fifth Plenary Session of the 19th CPC Central Committee proposed to “implement a high degree of external openness and inaugurate a new paradigm of win-win cooperation. By continuing to open up on a larger scale and at a deeper level, and relying on the advantages of its massive market, China can promote international cooperation and achieve mutually beneficial situations”. A high degree of opening up to the outside world is an objective requirement to ensure smooth and unimpeded domestic and international “dual circulation”, a key condition for China’s participation in international economic cooperation and competition. It is an inevitable trend as the country moves toward high-quality economic development and deeper integration with the global economy.

China must continue to implement the new development paradigm by opening up more sectors of its economy in a more thorough approach. First, it must optimize the spatial layout of its external opening up, strengthening cooperation by expanding transportation routes to the outside world. It should construct the Belt and Road Initiative with other countries, and help implement major projects along and around the “six corridors, six connectivity routes, and multiple countries and ports”.<sup>3</sup> At the same time, it should speed up the construction of pilot free trade zones and free trade ports, and use open platforms to effectively attract investment and create cross-border e-commerce industry chains. Second, it should make efforts to cover every major area of its economic system, significantly relaxing market access for foreign investment and encouraging more foreign investment. At the same time, it should shorten the negative list on foreign investment, continuing to open up traditional fields such as manufacturing and agriculture, and further opening up modern service industries to the outside world. Lastly, it should continue to promote institutional openness. China should better master international regulations and perfect its integrated domestic and foreign trade management system. At the same time, it should improve its governance

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<sup>2</sup> New infrastructure is an infrastructure system led by the new development concept, as driven by technological innovation, information-based networking, and oriented to the needs of high-quality development, providing digital restructuring, intelligent upgrading, convergence, and innovation services. New infrastructure mainly includes information infrastructure, convergence infrastructure, and innovation infrastructure.

<sup>3</sup> “The six corridors” refer to the China–Mongolia–Russia, the New Eurasian Continental Bridge, and economic cooperation corridors of China–Central Asia–West Asia, China–Indochina Peninsula, China–Pakistan, and Bangladesh–China–India–Myanmar. “The six connectivity routes” refer to the interconnected network of railroads, highways, waterways, airways, pipelines, and information highways. “Multiple countries” refers to the few important countries selected as the focal point of cooperation. “Multiple ports” refers to the construction of maritime pivot ports.

capability, participate in the formulation and refinement of international standards, and actively make its voice heard.

### **1.1.3.3 A Modern Circulation System is an Important Strategic Undertaking in Building the New Development Paradigm**

Domestic circulation and international circulation under the new development paradigm are inseparable from an efficient modern circulation system. A modern circulation system is not only the basic framework of large domestic circulation, but also the requisite market interface for domestic and international dual circulation. The construction of a modern circulation system can link production and consumption over a wider area, better coordinate the resources of the domestic and international markets, and better achieve division of labor and cooperation, so as to better attain large circulation as well as “dual circulation”.

In building the new development paradigm, China will construct a modern circulation system in four areas. First, it will enhance the circulation of its main entities; in other words, it will encourage and support high-quality enterprises to “go global” and “circulate” in the outside world, nurture modern circulation enterprises with international competitiveness, train high-quality international logistics personnel, and improve the efficiency of its circulation system. Second, it will plan and promote hardware and software construction in the modern circulation system. It will promote quality circulation infrastructure services, optimize its circulation infrastructure network, establish and improve its emergency logistics system, clear blockages and connect disconnected nodes to enhance circulation flow. At the same time, it will speed up the restructuring of information circulation and create a public platform for such circulation. Third, it will actively develop new technologies, new businesses, and new models of circulation. The circulation industry should invest in disruptive, cutting-edge technological research, and strive to achieve development breakthroughs in digital, network, and smart circulation. Fourth, it will strengthen its institutional mechanisms, constantly improving the social credit system, enhancing the range of supervision and responsibility traceability within the circulation industry, and quickly setting up a traceability system for important products.

### **1.1.3.4 Scientific and Technological Innovation is the Strategic Support Framework for Building the New Development Paradigm**

The fundamental feature of building the new development paradigm lies in achieving high self-reliance and self-improvement, i.e., China must further emphasize independent innovation and comprehensively boost its scientific and technological innovation. Scientific and technological innovation will create favorable conditions for the country to build an institution for a more advanced open economy, gaining new advantages in international cooperation and competition, and consistently driving national development and social progress. At the same time, it is an important force

for strengthening national security and development interests, and a strategic support framework for building the new development paradigm and modern economic system.

China must rely on its independent innovation and technological self-reliance to construct the new development paradigm, and fully unleash the strategic support role of scientific and technological innovation, strengthening this innovation in the following aspects. First, it will accelerate the pooling of nationwide resources for breakthroughs in core technologies. In other words, it will nurture strategic scientific and technological research teams of international pedigree. At the same time, breakthroughs in key core technologies must be achieved as quickly as possible. China must resolve the stranglehold problems that restrict innovation, and enhance the scientific and technological innovation and emergency response capacity of its institutional mechanisms. Second, it must plan, strategize and invest in leading-edge fields. That is, it must increase effort and investment in basic research, to achieve more “0-to-1” breakthroughs, master key fields, key links, key product innovation, and develop autonomy. At the same time, it should promote academic/industry collaboration, improve the transference and application rate of scientific research, and reduce the external dependence of its industrial core technologies. Third, it should fully grasp the new normal of scientific and technological innovation. It should nurture teams of talented scientific, technological and innovation workers, and establish a comprehensive incentive system for core talents. Fourth, it must improve its scientific and technological innovation ecology. That is, it should unswervingly enforce and protect intellectual property rights. Lastly, China should optimize its scientific and technological resource allocation, distributing more of its resources to scientific and technological innovators.

### **1.1.3.5 Deepening Reform is the Key to Building the New Development Paradigm**

The comprehensive deepening of reform will play a major role in building the new development paradigm. It is key to resolving the contradictions in China's economic and social development, and the endogenous engine to restructuring economic development, as well as liberating and developing the country's social productive forces, being the fundamental engine in national development.

Under the new development paradigm, China will deepen reform in the following areas, to ensure a better alignment between an efficient market and a well-functioning government. First, it will spur the vitality of various market entities; that is, deepen the reform of state-owned enterprises, optimize the state-owned economy, boost the development of private enterprises, and eliminate discriminatory, hidden, or regional market barriers and unreasonable restrictions. Second, it will deepen market-oriented reform. It will fully leverage the decisive role of the market in allocating resources, remove institutional mechanisms that impede the market-oriented allocation of factors of production and the circulation of goods and services, and promote the construction of market factors such as land, labor, capital, technology, and data.

It will remove blockages between sectors, industries, regions, and countries in the key links of production, distribution, circulation, and consumption, and speed up the formation of a large, unified, open, competitive, and orderly national market. Third, it will further reforms to streamline administration and delegate power, improve regulation, and upgrade services.<sup>4</sup> That is, it will give better play to the role of government, and ensure equal rights, opportunities, and rules for all market players, thereby creating a world-class business environment that is market-oriented, law-based, and internationalized, and which offers basic conditions and related services for all market players.

## **1.2 China's New Logistics Roles Under the New Development Paradigm**

As a service industry, logistics connects three main bodies: producers, sellers, and consumers. It is not only an important guarantee for enterprise production and sales, but also a vital support for the production and life of the people. By supporting a strong domestic market, modern logistics promotes a high level of opening up as well as the construction of a modern circulation system. It pioneers applications in innovative technology and deepens the reform of the logistics field, leading to high-quality economic development which has become a key path to the new development paradigm.

### ***1.2.1 Logistics is an Important Support for the Formation of a Strong Domestic Market***

At present, China is in firm control of its strategic underpinning of expanding domestic demand, as it quickens the construction of a more fluid, larger-scale, and better-structured domestic demand system. By upgrading the manufacturing value chain, innovating the commercial industry chain, and extending the agricultural supply chain, the logistics industry will improve the quality and efficiency of industrial development, and expand market demand. The total value of social logistics reflects the total value of all goods flowing from the place of supply to the place of reception, which is an important indicator of the total scale of social logistics. During the 13th Five-Year Plan period, the total value of social logistics in China grew from RMB 229.7 trillion in 2016, to RMB 300.1 trillion in 2020. The average annual

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<sup>4</sup> "Streamline administration and delegate power, improve regulations, and upgrade services" refers to the streamlining and delegation of governance and administration, the strengthening and improvement of regulations, and the optimization and upgrading of services.

growth rate was 6.6%,<sup>5</sup> effectively supporting the country's high-quality economic development. It has become an important support in expanding domestic demand and promoting the formation of a strong domestic market.

First, the developing logistics and manufacturing industries are deeply integrated, greatly enhancing the potential of domestic demand. A well-developed logistics industry ensures the smooth flow of the supply chain and the industry chain by seamlessly connecting raw materials, parts, intermediate goods, and final products between producers. At the same time, logistics strongly binds commodity production and final consumption together, playing a vital role in shaping large domestic production circulation in the manufacturing industry. Since its reform and opening up, China's manufacturing sector has built a complete and independent industrial system, gradually creating the intricate division of labor in its upstream, downstream and regional divisions. Its manufacturing industry is now ranked first globally in terms of scale. Industrial products are the most important service objects of China's social logistics, the total value of industrial product logistics accounting for more than 90% of its total social logistics. Accelerating the deep integration of the logistics industry with the manufacturing industry will not only crucially enhance the core competitiveness of the manufacturing industry, but also effectively help to develop the logistics industry.

Second, logistics has given birth to new business models and new modes of commerce, nurturing new consumer markets. Commerce logistics is a link that has a relatively large impact on costs in the entire logistics process, with the highest concentration of new technologies and business model innovation, directly affecting the smooth circulation of production materials and living materials. Special facilities and equipment such as advanced warehousing sorting, material handling, packaging processing, transportation and distribution, and advanced technologies such as bar codes, smart labels, radio frequency identification (RFID), visualization, tracking and tracing system, global positioning system (GPS), geographic information system (GIS), as well as a new generation of information technologies such as cloud computing, big data, blockchain, Internet of things (IoT) and mobile internet, have led to the formation of personalized services in commerce logistics. These take the form of "punctual deliveries", "deliveries by a certain time", "door-to-door" and other one-stop services, as well as other new distribution models such as direct distribution by suppliers, self-operated distribution by chain enterprises, socialized distribution, and joint distribution. At the same time, the commerce logistics network has accelerated its extension to small and medium-sized cities, and rural towns, extending to residential communities, with service capacity constantly being enhanced. In addition to satisfying the traditional offline sales of goods, commerce logistics has also created opportunities for developing new retailing by integrating online and offline e-commerce. Thus, it has completely changed the development ecology of traditional

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<sup>5</sup> As calculated from the data in the 2016–2020 "National Logistics Operation Bulletins" issued by the National Development and Reform Commission and the China Federation of Logistics and Purchasing.

commerce, creating a new industrial development and consumption scenario, while spurring the vigorous growth of a new industry and a new commercial model.

Finally, the logistics industry has extended the agricultural supply chain and effectively integrated urban and rural areas. Developments of the logistics industry, especially cold chain logistics and e-commerce logistics, could completely break the bottlenecks of restricted agricultural products circulation, high product loss, and asymmetric production and marketing information. China could establish an unbroken cold chain logistics network, with wide coverage and strong service function by relying on new sales models such as e-commerce platforms, micro-businesses, and live broadcasts to sell fresh and unique agricultural products to the whole country, and even the whole world. It could expand its sales radius exponentially and provide strong support for large-scale agricultural production and operation, realizing economies of scale (Xu and Qian 2020). At the same time, an efficient agricultural products logistics system will create favorable conditions for the integrated development of rural industries, by continuously consolidating the agricultural processing chain, rapidly developing the agricultural service chain, and constantly improving the agricultural function chain.

### ***1.2.2 Logistics is an Important Safeguard for the High-Level Opening up to the Outside World***

The Report of the 19th CPC National Congress emphasized the need to cover new ground in pursuit of openness on all fronts. This not only means expanding the scope of openness, broadening the areas and deepening the level, but also innovating ways of opening up, optimizing regional layout, and improving the quality of openness. Modern international economic competition to a large extent depends on the integration and innovation of the global industry chain and supply chain. Seen from the perspective of logistics infrastructure interconnection and international economic and trade cooperation, logistics can guarantee the stable operation of the industry chain and supply chain, and helps support China's high-level opening up.

First, logistics infrastructure is the cornerstone of interconnection between countries. The construction of high-quality, sustainable, risk-resistant, reasonably priced, inclusive, and accessible infrastructure is conducive to each country exerting its resource advantage to the full, and promotes the stable and smooth operation of the global industry chain, supply chain, and value chain. The degree of interconnection between logistics infrastructure and the efficiency and convenience of international and domestic logistics corridors determines the development of domestic and international markets, as well as the convergence level between their respective logistics systems. At present, a general connectivity framework consisting of six corridors, six connectivity routes, and multiple countries and ports is now in place. The China–Europe Railway Express has gradually formed a network centering

around five major transportation systems—the “Chongqing–Xinjiang–Europe Railway”, the “Chengdu–Europe Express Railway”, the “Zhengzhou–Europe Express”, the “Wuhan–Xinjiang–Europe Railway” and the “China–Europe Chang’an Freight Train”. The “Chengdu–Europe Express Railway” has shortened the transportation time from Sichuan to Europe from more than 40 days via ocean shipping in the past to just 11 days. After the completion of the Trans-Asian Railway, the transportation time from Yunnan and Guangxi to the countries in Indochina will drop from 24–26 h to 14–21 h (ydyl.china.com.cn 2018). The interconnected logistics infrastructure not only brings China closer to the countries in the Belt and Road Initiative, but also deepens economic and trade ties between these countries and China.

Second, the international logistics network is a major transport artery that connects countries globally in economic and trade cooperation. The strengthening of international cooperation based on global connectivity networks, international logistics and transportation, and the global supply chain and value chain is of great significance for China, to fully utilize international resources and expand its global markets. At present, the international logistics network has quickened its expansion pace, integrating China deeply and effectively with the global supply chain, and enabling industry to advance to the middle and high-end of the global value chain. China has signed bilateral air transport agreements with 127 countries and regions, and bilateral inter-governmental air transport agreements with 96 countries in the Belt and Road Initiative, maintaining regular passenger and cargo traffic with 54 of them (www.gov.cn 2020). By 2020, China's international air cargo traffic was flying to 75 countries worldwide. By the end of 2020, the China–Europe railway lines were operating more than 30,000 trains, realizing trade between 71 Chinese cities and 92 cities in 21 European countries, with more than 70 steadily increasing domestic routes in operation, and many connected cities (chnrailway.com 2021).

### ***1.2.3 Logistics is an Important Link in the Modern Circulation System***

The modern circulation system is the basic support framework of large circulation and dual circulation, and so is of crucial importance in helping China to build a new development paradigm and modern governance system with modern governance capability. Logistics is an important aspect of circulation, and transportation is an important support for logistics. Transportation connects the two ends, production and consumption, and is the basic link and important support for the construction of a modern circulation system, ensuring smooth circulation of the national economy (people.cn 2020).

First, unimpeded logistics channels are important carriers in realizing regional interconnection. A high-quality logistics infrastructure network can ensure the free flow of resource elements, promote the rational allocation of different industry chain links in cities along the route, foster the growth of a new channel economy model, and

effectively promote the flow of elements across regions and industries. It can remove the spatial and temporal limitations of production and operational activities, and connect different regions closely together, creating better conditions for optimizing the spatial layout of the economy and promoting coordinated regional development (Xu and Qian 2020). At the end of the 13th Five-Year Plan period, China's railroad operating mileage had reached 146,300 km, including approximately 38,000 km of high-speed rail, ranked first in the world. The total distance covered by China's highways is 5,198,100 km, including 161,000 km of expressways, also ranked first in the world. The total distance covered by its inland waterways is 127,700 km, the mileage of graded waterways reaching 67,300 km. There are 2,138 berths in coastal ports for the 10,000-or-more ton class, and 241 civil airports (Ministry of Transport of the People's Republic of China 2021). The number of logistics parks increased from 207 in 2006 to 1,638 in 2018. In addition, China has accelerated its construction of a modern "channel + hub + network" logistics operation system. In 2019–2020, the National Development and Reform Commission and the Ministry of Transport constructed 45 national logistics hubs, covering 27 provinces, autonomous regions and municipalities, providing strong support for China's modern circulation system.

Second, a specialized logistics system is an important link between supply chain and industry chain. The improvement of specialized logistics services and the establishment of a logistics service system create favorable conditions to continuously consolidate the processing chain, rapidly develop the service chain, refine the functional chain, and extend the industry chain. Specialized logistics efficiently organizes and manages procurement, production, transportation, processing, storage, delivery, and distribution activities from supply to consumption. In the process, it preserves production materials and products, and increases their value, thus becoming an important driving force in industrial modernization (Xu and Qian 2020). China's agricultural products' cold chain logistics, manufacturing logistics, commerce logistics, automobile logistics, and other specialized logistics systems are currently being developed, effectively linking the upstream and downstream sections of the supply chain, and playing an important role in bridging and supporting the industry chain.

Furthermore, the rapid response of the emergency logistics system crucially safeguards the circulation of major public security materials. Such strategic materials play an important role in the national economy and defense, and are related to national public security. By constructing a strong domestic strategic material reserve base and an emergency logistics network, and by building a rapid response emergency logistics system, China can effectively guarantee the timely supply of essential goods, medical relief supplies, and epidemic prevention materials, so as to properly respond to natural disasters, public health issues, and other emergencies. During the COVID-19 pandemic, the production, procurement, deployment, and supply of key materials such as medical masks, protective gear, goggles, medical alcohol, and disinfectant has been crucial. There is also an urgent need to maintain the daily supply of these materials for production and life in the pandemic-affected areas. China's emergency logistics has played an important role as a "lifeline" in the war against the pandemic, maintaining the smooth and orderly operation of production and life as the "vanguard commander". From January 27, 2020, to April 18, 2020, a total of 1,344,100 tons of

pandemic-prevention materials and daily necessities were transported to the Hubei area from the rest of China, together with another 2,124,800 tons of production materials such as coal and fuel. Freight ships from the rest of China entered and left port 50,200 times, making 849 trips ferrying key materials in Wuhan waters, including more than 1.713 million tons of coal, 411,000 tons of fuel, and 181,000 tons of grain (www.rmjtxw.comc 2020). China's emergency logistics ensured that the demand for daily necessities and medical supplies in Hubei Province was met.

### ***1.2.4 Logistics Will Become the Leading Field of Application for Scientific and Technological Innovation***

There is now a greater need than ever for scientific and technological solutions as China develops economically and socially while aiming to improve people's livelihoods. There is a need to foster innovation as a primary driving force. Accelerating scientific and technological innovation is necessary to promote high-quality development, realize high-quality lifestyles, construct a new development paradigm, and successfully embark on the new journey of building a modern socialist country. The logistics industry is the testing ground for many cutting-edge technologies and intelligent equipment. 5G, robotics, blockchain, artificial intelligence (AI), and other popular technologies and equipment are of wide concern to society, and have broad applications in the logistics industry. The integration of advanced technologies with the logistics industry and development has given the traditional logistics industry a fresh stimulus, with integrating technologies in different fields producing a new industry ecology.

The widespread application of modern technology and equipment connects the logistics links even more closely, which not only improves logistics efficiency and service diversity, but also gives rise to new technological applications and new business models. It has become the new driving force for logistics innovation and development (Xu and Qian 2020). In warehouse technology, AGV (automatic guided vehicle), unmanned forklifts, shelf shuttles, sorting robots, and other robotics drive the transformation of traditional warehousing to smart warehousing. In unmanned technology, unmanned aircraft, unmanned freighters, unmanned railroad wagons, and unmanned trucks have changed the traditional mode of trunk transportation. In terminal technology, unmanned aerial drones and intelligent courier cabinets are being used to solve the problem of "the last kilometer" distribution at the end of the chain. In blockchain application, due to long transaction links, complex operation processes, and most market segments being relatively fragmented and low in concentration, the logistics and supply chain field has become an important industrial area in the application of blockchain technology. In addition, during the 13th Five-Year Plan period, China's deepwater channels and high-speed railroad construction technologies were among the best in the world. The fourth phase of the Shanghai