

Accelerating the Construction of New Development Pattern and the Paths of Manufacturing Transformation and Upgrading

Kesha Guo, Xiaoxiao Tian*

This paper reviews the basic implications and policy orientation of the new development pattern and the impacts of constructing the new development pattern on the manufacturing transformation and upgrading, based on which the choice of manufacturing transformation and upgrading paths is further discussed under the new development pattern. This paper holds that the paths of manufacturing transformation and upgrading need to be adjusted and expanded under the conditions of constructing the new development pattern. The main ideas are as follows. Restructuring the manufacturing industry chain with the large domestic market as the main guide, creating the good environment conducive to independent innovation, coordinating the regional layout for the overall high-quality manufacturing development, optimizing the business environment and enhancing the vitality and driving force of the manufacturing's development, relying on the Belt and Road Initiative (BRI) for a higher level of international circulation. The theoretical bases for adjusting and expanding the paths of manufacturing transformation and upgrading are: embracing the new requirements with domestic circulation as the mainstay, the characteristics with the mutual reinforcement of domestic and international circulations, and promoting the manufacturing's high-quality development and the medium and high-speed growth.

Keywords: new development pattern, manufacturing, transformation and upgrading, theoretical bases

1. Introduction

International uncertainties and instabilities have grown since the COVID-19 pandemic swept across the globe in 2020. New challenges are facing the domestic economic operation in China. Factor costs-based comparative advantages are

* Kesha Guo (corresponding author, email: guokeshaa@263.net), Ph.D. in Economics, Professor & Ph.D. Supervisor, School of Economics and Finance, Huaqiao University, China; Xiaoxiao Tian, Ph.D. Candidate, School of Economics and Finance, Huaqiao University. Fund project: "Research on Major Issues of Coordinated Development of Secondary and Tertiary Industries Amid the Service-Oriented Manufacturing Transformation", supported by Major Projects of the National Social Science Fund of China (20&ZD087). This paper is an excerpt from the authors' Chinese article on *China Industrial Economics*, No.11, 2021.

disappearing; structural adjustment and conversion of growth drivers are being constrained; economic security risks are rising; pivotal core technologies are underdeveloped; and transformation and upgrading of the manufacturing are becoming harder. Meanwhile, confronting multiple constraints, the growth rate and proportion of the manufacturing in China continued to decline. The proportion of manufacturing value added in GDP fell from 32.45% in 2006 to about 26% in 2020, symbolizing a premature, excessively fast deindustrialization.

In this context, China's central government made a major decision to foster the new development pattern with domestic circulation as the mainstay and domestic and international circulations reinforcing each other. Standing at a new stage of development, this decision embraces the basic laws of economic development for a major country and is needed for coping with global economic uncertainties and safeguarding China's economy. It will be of long-term strategic significance for China as a major country to handle the relationship between economic self-reliance and dependence on foreign environment and drive the high-quality economic development on a sound, coordinated and sustainable basis.

Constructing the new development pattern is a holistic, long-term development strategy that reveals the new policy framework and market environment in the current and coming periods of economic development. A major concern now is that it will lead to adjustments and transformation of resource allocation mode and focus. It will change the conditions and space for manufacturing transformation and upgrading in China, and then new efforts will be needed in looking for the directions and paths of manufacturing transformation and upgrading. As well as analyzing the basic implications and policy orientation of the new development pattern and the impacts on the manufacturing transformation and upgrading, this paper probes into the choice of manufacturing transformation and upgrading paths under the conditions of domestic circulation as the mainstay, including how to adjust and expand the paths of manufacturing transformation and upgrading, and the theoretical bases accordingly.

2. Basic Implications of Constructing the New Development Pattern

To command the new development pattern's full implication and for economic theorists to reach a consensus as soon as possible, more accurate, general expressions are selected also to avoid possible misunderstandings by non-professionals. Internal relations of the keywords will be further elaborated.

2.1. Relationship between "Domestic Circulation as the Mainstay" and "Domestic and International Circulations Reinforcing Each Other"

At a new stage of development, to promote socialist modernization and sound

economic growth, especially the high-quality development, China must break through constraints of structural issues, unblock the circular system of the national economy, remove barriers holding back the economic operation and the financial sector, so that a virtuous circle between the market and the production entities, between growth and social employment, and between finance and the real economy will come into being. Obviously, the domestic circulation remains as the mainstay in the smooth flow throughout the national economy in China. It is the core and basic implication of the CPC Central Committee advocating to constructing the new development pattern, and a policy focus for growing the economy for a long period of time in the current and in the future. The emphasis on domestic circulation means fully utilizing the strengths of domestic markets and optimizing the long-term strategy of expanding domestic demand, while enhancing the self-reliance and self-improvement capacities in factor supply, technological development and resource allocation. The emphasis on the mutual reinforcement of domestic and international circulations indicates that the domestic circulation is not closed or isolated. China still sticks to the basic national policy of opening wider to the outside world and will continue to make use of domestic and international markets and resources. China will not weaken or abandon the international circulation just because of the mainstay of domestic circulation, but will engage in international circulation with higher levels and quality as it unblocks domestic circulation. It is the internal relationship in the basic implications between the two phrases about the new development pattern, a relationship in which the primary and secondary positions are clear, interrelated and interdependent.

2.2. Relationship between the Mutually Reinforcing Domestic and International Circulations

Domestic circulation is the foundation, driving force and guarantee of international circulation, as is shown above. There may create favorable conditions or adverse constraints. Only by unblocking domestic circulation will China engage in international circulation better. International circulation will provide more operating conditions and larger development space and inject new vitality and driving force as the extension and supplement to the domestic circulation. From the leading relationship, international circulation once played a leading role to domestic circulation in the years after WTO accession and the international circulation strategy was suggested, especially when coastal areas launched the export-oriented development strategy. As China gradually adjusted its development strategy since 2006, especially after the global financial crisis, the role of international circulation has been weakening, while the position of domestic circulation has been rising continuously. After the strategic change of the CPC

Central Committee to construct the new development pattern, the leading role of domestic circulation to international circulation will be established. In the mutual reinforcement, domestic circulation will be the principal part of the contradiction and play a role in dominating, guiding and driving international circulation which in turn will play a coordinating, supplementing and coordinating role to domestic circulation.

2.3. The New Development Pattern with Domestic Circulation as the Mainstay and Domestic and International Circulations Reinforcing Each Other in Line with the Basic Laws and Trends of Economic Development in Major Countries

With the total economy rising to the world's second place and far exceeding Japan in the third, China's total import and export volume has substantially grown to produce a great influence on the markets at home and beyond. From past economic development laws in major countries, moderately cutting the dependence on foreign trade at this stage may be a reasonable choice. The dependence on foreign trade is mainly related to the economic scale among the global top 10 economies, except for several major EU countries whose dependence on foreign trade is generally higher because of the impact of EU economic and trade integration. China's foreign trade dependence was 35.84 %, 9.54 percentage points higher than that of the United States (26.29 %) with the largest economic aggregate, and 1.08 percentage points higher than that of Japan (34.76 %) with the third economic aggregate, according to the data before the global COVID-19 outbreak in 2019. Generally speaking, it is still at a high level. Under the conditions that China turns to a new economic strategy with domestic circulation as the mainstay and domestic and international circulations reinforcing each other and witnesses sound, rapid economic growth and rising economic aggregate, the foreign trade dependence, as an important indicator of engaging in the international circulation, may keep a relatively declining trend, but it will continue to be higher than that of the United States for a long period of time. Then it is reasonable to say that China's construction of a new development pattern fully conforms to the basic laws and characteristics of the economic development in major countries, and will not affect it opening up the economy to the outside world or developing the socialist market economy.

3. Impacts of Constructing the New Development Pattern on Manufacturing Transformation and Upgrading

Since China's economy entered the new normal, the official philosophy of manufacturing transformation and upgrading has been explicitly stated in the

Industrial Transformation and Upgrading Scheme (2011–2015). The main contents are as follows. Transformation is to transform from old industrialization to a new industrialization by changing the mode of industrial development; upgrading is to improve the overall industrial structure with a comprehensive optimization of the technical structure, organizational structure, layout structure and industrial structure.¹

Constructing the new development pattern is an initiative based on a new stage of development in China. As an all-round, systematic development strategic arrangement, it will produce both long-term guidance and short-term promotion on the manufacturing transformation and upgrading.

3.1. Demand Impact

Consumption is a fundamental driver for economic growth. From 2011 to 2019 the contribution rate of consumption demand to the annual GDP growth had been more than 50%, with the highest reaching 69% in China. Not only the most stable force driving economic growth, the upgrading of residents' consumption structure is promoting the industrial restructuring and the manufacturing transformation and upgrading. Under the conditions of speeding up constructing the new development pattern, the long-term strategy of expanding domestic demand is bound to take a bigger place and intensify the policy efforts. The upgrading of consumption structure will lead to the change of supply structure and make the domestic supply system more effectively meet the upgrading of consumption demand, significantly driving the manufacturing transformation and upgrading.

In highlighting the dominant position of domestic circulation, the interaction between market consumption and market investment will be further activated. Consumers' growing awareness of free choice and autonomous consumption will help stimulate the potential of domestic consumption and the impetus for consumption upgrading, and press for the adjustment of production structure and the improvement of supply quality. This will lead to the growth of market investment and the optimization of investment structure, and expand upstream and downstream investment demand and infrastructure investment demand. The demand expansion and structural changes will create new impetus for the manufacturing transformation and upgrading.

In general, China's huge and ever-expanding domestic demand market has provided a growing demand pull for the manufacturing transformation and upgrading. China must make full use of its super large market as a major economy in the world

¹ *Circular of the State Council on Printing and Distributing the Industrial Transformation and Upgrading Scheme (2011–2015)*. http://www.gov.cn/zwqk/2012-01/18/content_2047619.htm, 2012.

and accelerate fostering a complete domestic demand system, which will help to release the huge and lasting market power and vitality. Facing the increasingly complicated and ever-changing international landscape, besides fueling the economy by prospering domestic economy and smoothing domestic circulation, China must deepen the reform and open wider to the outside world and grow a high-level open economy, as well as make the best of the mutual reinforcement of domestic and international circulations for transforming and upgrading the manufacturing stably and sustainably.

3.2. Technological Impact

Technology R&D and innovation will usher in a new situation in the conditions of constructing the new development pattern. The sources, models and objectives of innovation will face some new adjustments and changes. In China's past long-term development pattern, one of the basic paths for technological progress of enterprises is to introduce, take in, absorb and re-innovate, and innovation accounts for a large proportion under the condition of technology introduction. The construction of the new development pattern needs accelerating the progress in independent innovation capability, as new technological sources will rely more on the independent innovation in pivotal industries and sectors. Furthermore, this transformation in technological innovation and the way of technological progress will need a smooth circulation in domestic economy, especially the circulation of technological factors and markets.

When advancing the manufacturing transformation and upgrading under the new development pattern, the greatest technological impact is to change the ideas and models of innovation to find paths of independent innovation and high-quality development that adapt to Chinese characteristics. Relevant information shows that "Guangzhou Honda" (hereinafter referred to as "Honda") was only engaged in processing and production, but in recent years it has developed complete intellectual property rights of its own through independent innovation and launched a new product series, among which "Trumpchi" sells more than 500000 cars a year when it goes down in the automobile market, elevating its position on the smile curve (Jia and Liu, 2021). It is predicted that in the new development pattern with domestic circulation as the mainstay, there will be more and more examples of high-quality development driven by independent innovation, and the manufacturing transformation and upgrading with Chinese characteristics will be well accelerated.

3.3. Spatial Impact

Spatially, both domestic circulation and international circulation cover production,

distribution, circulation and consumption. While it is mainly to grow the economy of coastal areas in the period of rapid expansion of international circulation, the pattern with domestic circulation as the mainstay and domestic and international circulations reinforcing each other is to boost the full-round development of the eastern, central and western regions, especially the high-quality development, and even become a greater driver for developing the central and western regions. The old open development model, generally, was first tested in coastal areas, and then slowly launched to the central and western regions after a period of pilot. The new development pattern refers to the all-round opening up in the east, west, north and south, a situation which is all over China by advantage of domestic and international circulations, dominated by the former.

The coastal manufacturing, long relying on the external circulation, needs a transformation of regional development with internal circulation as the mainstay. Being highly export-oriented, the manufacturing is strongly affected by the external environment. China's merchandise exports have unexpectedly increased dramatically against the trend since 2020. Some scholars therefore believe that in the short term, once the external environment changes, resulting in the "pandemic dividend" fading and "stay-at-home economy" changing obviously, the manufacturing may be hit again. In the long run, the rapidly expanding external demand will drag down the export industrial restructuring, enabling low-tech and value-added labor-intensive industries to obtain a staged advantage. The "hard-to-find-a-job" reality rapidly pushes up the labor prices and will weaken the international competitiveness of export industries under the effect of wage rigidity (Lian and Luo, 2021). There is some truth in this view, and more in-depth analysis is needed. It should be noted that as long as high-quality development is persistently promoted and coordinated development of regional economies is driven amid the construction of the new development pattern, with domestic circulation as the mainstay, the industrial restructuring in the post-pandemic era will soon return back to the normal track, the manufacturing transformation and upgrading in each region will enter a new period of development, the manufacturing development will speed up and shift to a new model with internal circulation driving the dual circulations, and the over-dependence on exports can not and will not be followed.

From the perspective of sustainable economic development, as a large developing country striving to climb to the top of the international division of labor system, it is a big issue to properly handle the connection between large domestic markets and the international diversified markets. Facing the continuous expansion of domestic market capacity and rising uncertainties in the external environment, the manufacturing in the eastern coastal areas and the central and western regions need to develop more of large domestic markets and improve their international competitiveness in technological innovation and industrial upgrading. During the

14th Five-Year Plan period, China will rely on developing a large national market system and unblocking the economic circulation to expand the breadth and depth of domestic markets, and rely on deepening supply-side structural reforms to drive industrial layout and restructuring, which will be a main endogenous power for coordinating regional economic development and the manufacturing transformation and upgrading.

4. Choice of Manufacturing Transformation and Upgrading Paths under the New Development Pattern

4.1. Basic Paths of Manufacturing Transformation and Upgrading at the Current Stage

4.1.1. Academic Analysis

Based on the existing literature, the paths of manufacturing transformation and upgrading in academic research could be roughly summarized as the upgrading path of industrial structure, the upgrading path of industrial transfer, the upgrading path of value chains, the upgrading path of technological innovation, and the upgrading path of deepening the division of labor.

The upgrading path of industrial structure. A crucial part of the manufacturing transformation and upgrading is the industrial restructuring. The theoretical paradigm of neo-structural economics, represented by Lin Yifu, emphasizes the leading role of comparative advantages based on factor endowments in industrial upgrading. He holds that the upgrading of industrial structure shall follow the change of factor endowments structure of a country (or region), stress the capital accumulation, and advocate a capital-driven industrial upgrading model (Lin, 2012). In the manufacturing sector, basically, it will upgrade the resource- and labor-intensive manufacturing to technology- and capital-intensive manufacturing, and the old low-end manufacturing to modern, advanced and emerging manufacturing. China's manufacturing has a large scale and complete systems, but the overall development level is still relatively low. There is still a big gap between China and developed countries in the advanced manufacturing field where high-tech achievements are comprehensively applied to the production of products, because many pivotal equipment and core components need to be imported. Striving to develop the advanced manufacturing system including high-tech manufacturing and high-end equipment manufacturing will be the way to go for upgrading industrial structure of the manufacturing, and will result in great potential and space for development.

The upgrading path of industrial transfer. Since this round of international financial crisis, labor-intensive industries in eastern China have started to move to foreign

countries and the central and western regions. Local governments in the eastern region have soon launched a “vacating cages to change birds” policy to support the development of capital- and technology-intensive industries. For the central and western regions, compared with the original level of manufacturing development, undertaking industrial transfer from the eastern region will improve their industrial structure. Industrial transfer creates conditions for industrial restructuring and optimization in the central and western regions, as it opens up space for the industrial upgrading in the eastern region. Some scholars discussed the new paths of transformation and upgrading of regional manufacturing from the perspective of establishing national demonstration zones for undertaking industrial transfer. The establishment of demonstration zones will help the industrial agglomeration and innovation and upgrading to push forward the manufacturing upgrading. In regions with low initial technical level and high factor endowments and in western regions with strong government capacity, the promotion of demonstration zones on manufacturing upgrading is significant (Wang *et al.*, 2020). This kind of research analyzes the connection between regional industrial transfer and national policy promotion, discusses a pilot model and phased results of government efforts to promote inter-regional industrial transfer, and reveals a feasible path of manufacturing transformation and upgrading. This issue could be further analyzed from the perspective of the interaction between government and market as a way of exploring the possibilities for China to coordinate regional relations and guide the role of market in the manufacturing transformation and upgrading.

The upgrading path of value chains. With global value chains as the analysis framework, the design, R&D and brand marketing with high added value at both ends of the smile curve determine the direction of manufacturing upgrading. Some scholars suggested four methods of upgrading: process upgrading, product upgrading, function upgrading and chain upgrading (Gereffi, 1999). Some pointed out that the manufacturing could improve the profit margins and upgrade from the low end to the high end through a service-oriented transformation that increases the concentration of knowledge-based service factors in products and reduces the costs for coordinating all parts of the value chains (Zhou, 2013). Some scholars have categorized paths of the manufacturing’s service-oriented upgrading: 1) The core step includes the collection, transmission, processing and use of consumer big data, supported by the big data technology, information and communication technology and intelligent technology. 2) Innovation-oriented industries take the lead in realizing servitization and drive that of other manufacturing industries; 3) The transformation from product-based manufacturing to service-based manufacturing: product-based manufacturing, mainly embedded in the product value chain through the low value-added chain, is in a disadvantageous position to be governed in value chains, while service-based manufacturing, mainly

embedded in the product value chain through the integration of high added value, is in a favorable governance position in the value chain (Xu *et al.*, 2016). The above views expound the ways and paths of upgrading the manufacturing value chains from different perspectives, indicating that a major trend of upgrading the value chains is the service-oriented transformation, which is the digitalization, networking and intelligent transformation of the manufacturing, and reveals the integration and application of high-tech services as well, with the ways and paths diversified and ever-enriched.

The upgrading path of technological innovation. The theoretical paradigm of evolutionary development economics represented by Jia (2018) emphasizes the decisive role of technology catch-up based on independent innovation in the industrial upgrading, and advocates technology-driven upgrading with independent innovation investment as the primary path. Some scholars have verified that the direct effect coefficient of technological innovation on the manufacturing transformation and upgrading is significantly positive. Not only as a core driver directly promoting the manufacturing transformation and upgrading, technological innovation advances the manufacturing transformation and upgrading by industrial integration. At the same time, based on the mediating effect model, the paper empirically analyzes and identifies two indirect paths of technological innovation to promote the manufacturing transformation and upgrading: technological innovation → industrial integration → manufacturing transformation and upgrading; technological innovation → industrial integration → technological innovation → manufacturing transformation and upgrading (Zhao and Pei, 2019). Many scholars believe that China has deeply engaged in the international division of labor and open innovation will effectively reduce the risks of technological innovation and shorten the time of technological application (Jin *et al.*, 2016). Under the old development pattern, enterprises developed open innovation of every form, which could be used as a primary path to enhance the manufacturing technical strength in China. Some scholars also studied the impact of open innovation in M&A on corporate independent innovation, arguing that the acquirer has the ability to integrate the innovation consciousness from the acquired party, and turn external creativity into endogenous innovation power characterized by the development of new products (Yu and Wang, 2008). Obviously, the scope of technological innovation driving the manufacturing transformation and upgrading is quite broad. With the channels and paths constantly expanded by theoretical research and practice, technological innovation brings about a strong driving effect, spillover effect and sustainability and is having an increasingly far-reaching impact on the manufacturing transformation and upgrading in China. However, there should note that constraints of many kinds at home and abroad are facing the open innovation. Under major changes

in the international economic and technological environment, the innovation paths need more discussion, especially in the context of constructing the new development pattern. The open innovation-driven model for manufacturing transformation and upgrading needs to be adjusted and transformed and more paths are waiting to be discovered.

The upgrading path of deepening the division of labor. It means to pursue the upgrading marked by the progress in labor productivity or capital productivity, which removes the auxiliary production department and focuses on developing the manufacturing. Each region finds their own orientation, selects leading industries and focuses, deepens regional division of labor and cooperation, and integrates into domestic and international division of labor systems, based on such ideas as “focusing on certain tasks while putting others aside”, “giving full play to comparative advantages and latecomer advantages” and “developing their own unique competitive advantages”. A number of world-class manufacturing clusters have risen. Some scholars found that no matter what type of manufacturing enterprises, there has been a deepening division of labor marked by a decline in the share of non-manufacturing business income after the VAT reform in the service sector (Li and Yan, 2018). It is noted that this deepening division of labor also constitutes an alternative path for the manufacturing transformation and upgrading. It may be related to the indirect impact of the fiscal and tax reforms, and may be a short-term temporary phenomenon, but it is still an issue of concern in the research of the manufacturing transformation and upgrading.

4.1.2. Characteristics of Government Promotion

The formulation and implementation of industrial policies is an important part of high-quality manufacturing development and a crucial measure for the manufacturing transformation and upgrading in China. A series of policy documents were announced basically every year by the State Council and relevant ministries and commissions in 2015–2020 as guidelines for the manufacturing transformation and upgrading. These documents, formulated and implemented by the central government departments, are guiding the behavior orientations of local governments, relevant departments and manufacturing enterprises, revealing the basic directions and paths of government leading the market and the manufacturing transformation and upgrading.

The paths of manufacturing transformation and upgrading promoted by the government are quite different from those in academic research and discussion in nature. The characteristics are as follows. 1) The policy documents are published directly by the State Council or its subordinate ministries. Most documents provide policy information to the entire society, which are distributed to the corresponding

departments of local governments as the main policy guidelines or references for implementation in work. 2) It is of holistic significance for guidance. Documents supporting the manufacturing transformation and upgrading, whether published by the State Council, by multiple ministries and commissions together, or by the Ministry of Industry and Information Technology in charge of professional management and coordination, or being industry-targeted or content-specific, are of policy implications for all regions across China and affect the overall work. 3) It has the basic nature of medium- and long-term policies. The documents released by the State Council and relevant ministries and commissions to promote the manufacturing transformation and upgrading are, under normal circumstances, not only relatively realistic and targeted, but also of strategic height, and will guide and coordinate the relevant work for a relatively long period of time. 4) It has policy binding effect. Under the background of developing the socialist market economy and deepening reform and opening up, the documents released by the State Council and relevant ministries and commissions are mainly for the purpose of providing relevant policy information and guiding the market behavior. They are generally guidance or guidance-oriented. Even with some supporting guiding measures, there is no mandatory means of implementation. That being said, the documents have certain policy binding effect on the subjects involved, especially local government departments, state-owned enterprises (SOEs), etc., and no direct violation of policy provisions is allowed.

4.2. Adjusting and Expanding Paths of Manufacturing Transformation and Upgrading under the New Development Pattern

The construction of the new development pattern requires adjustments and changes in the manufacturing transformation and upgrading. Facing the new situation and challenges at the new stage of development, the manufacturing must look for paths to improve its independent innovation, enhance its domestic circulation capacity and enhance its status in international circulation.

4.2.1. Restructuring the Manufacturing Industry Chain with Domestic Market as the Mainstay

Starting with the domestic economic circulation, the manufacturing industry chains need a re-integration to smooth the internal relationship between regional industries and markets, drive the transformation and upgrading of the industrial structure, and realize the benign interaction between supply and demand. Some scholars believe China's domestic value chains have become the primary force pushing up the value, and the internal inter-regional connection is a main reason affecting the integration

of domestic value chains. Coastal-inland interactions must be accelerated and the regional market segmentation must be broken to ensure the smooth circulation among regions for higher-level engagement of high-end factors, if the continuous rise of the manufacturing value chains is to realize. (Yuan *et al.*, 2019). This view is reasonable and adapts to the background of constructing the new development pattern. New paths of the manufacturing transformation and upgrading must be in line with the new trends and requirements of unblocking the domestic circulation. The sound, sustainable operation of industrial upgrading chains relies on deepening reform and opening up and the modernization of industrial chains relies on technological progress. In this way, the stability and competitiveness of the supply chain on the industrial chains will be promoted constantly.

Enhancing competitive advantages in the new round of global manufacturing industrial layout, based on the demand of large domestic markets and the advantages of regional factor endowments, is an important way of transforming and upgrading China's manufacturing. As the development of western China, the revitalization of old industrial bases in Northeast China, the rise and development of central China, the leading development of eastern China, the coordinated development of Beijing, Tianjin and Hebei, the development of the Yangtze River Economic Belt, the development of Guangdong-Hong Kong-Macao Greater Bay Area, regional development strategies and urban-rural development strategies for rural revitalization continue to deepen, the manufacturing has gradually transformed and upgraded amid industrial chains' restructuring, and created favorable conditions for engaging in domestic circulation. In adapting to the new development stage and constructing the new development pattern, the manufacturing transformation and upgrading needs to be connected with the adjustment and transformation of national development strategies, and the industrial chains' restructuring and upgrading should be more oriented by developing the huge demand of domestic markets and utilizing regional comparative advantages. Manufacturing enterprises should focus more on the above when developing and upgrading their technology R&D, product design and marketing.

4.2.2. Actively Creating a Favorable Environment for Independent Innovation

Some scholars suggested developing independent innovation from the national, market and enterprise levels. At the national level, we should strengthen scientific strategic planning, increase investment in basic scientific research, optimize the layout of scientific research, stress original and cutting-edge innovation, improve the basic technology supply system, and prepare theoretical bases for corporate development and application. At the market level, it emphasizes the coordination and complementarity of innovations and the reverse innovation in which enterprises

trade innovations via the market mechanism, improving the utilization efficiency of resources and avoiding waste of resources caused by repeated development. At the enterprise level, innovation should orient towards completing the supply chain, solving “bottleneck” problems and developing core technologies. Through technological innovation, the added value of the manufacturing will be grown, the smile curve reversed, the industrial model reshaped, and then the bottleneck holding back the corporate development broken (Ge and Yin, 2021). Some scholars believed that to make up the manufacturing supply chain with innovation, we should move to develop core technologies. With China’s institutional advantages featuring concentrated efforts on major issues, we should step up investment in scientific research and take the initiative of development in our own hands. On the “long board”, the dependence of global industrial chains on China should be consolidated, forming a strong countermeasures and deterrent capability against the artificial interruption of foreign supply, while on the “short board”, countermeasures under different situations should be made and pivotal core technologies should be captured in a planned and targeted manner (Ma and Zhao, 2020).

It is noted that the roles of the country, the market and enterprises in independent innovation differ objectively. Reasonable distinction and positioning of roles of the three levels in promoting innovation, the use of China’s institutional advantages to deal with the containment and suppression of external forces, and the pool of national strengths to overcome core technological difficulties are conducive to effectively allocating innovation resources in China. Another issue of equal concern is how to coordinate the relations among the three levels and to foster a good industrial environment that guides, supports and protects independent innovation. In the initial stage of accelerating the construction of the new development pattern, it is of great strategic significance to moderately strengthen the national promotion of independent innovation. However, attention must be paid to giving full play to the principal role of enterprises in independent innovation, to making the market play a decisive role in allocating innovation resources, and to set up an effective market regulation and correction mechanism. Besides, technological and institutional innovations should be developed together for the sustainability of manufacturing transformation and upgrading.

4.2.3. Coordinating Regional Layout for High-Quality Manufacturing Development

Currently, the imbalance of scientific and technological development among regions in China is prominent. From the perspective of urban agglomeration, in 2020 the scientific and technological innovation development index of the Yangtze River Delta urban agglomeration reached 0.8583, significantly stronger than that of other urban agglomerations, and that of the central urban agglomerations around Shanxi

was the lowest (0.1487), with a difference of as much as 0.7096 (Guan and Zhao, 2021). This regional gap in the development of science and technology innovation has caused disparities in manufacturing development quality among regions, providing space for the flow of innovation resources and the improvement in development quality. Efforts should be made to eliminate the hindrance of local protectionism on the manufacturing development nationwide, break down market segmentation among regions, smooth the circulation of production factors and strengthen the role of market mechanism in guiding the flow of resources among regions and effectively allocating the resources through the regional development strategic planning and regional coordinated development policies. These will enable regions with different advantages such as high-tech R&D bases, advanced manufacturing bases, raw material production bases and energy resource development bases, to enjoy the space for open development, while making the eastern, central and western regions and urban agglomerations in the north and south to exert their comparative advantages and development potentials in an effective circulation of factors and markets, so as to shape a regional environment conducive to the manufacturing transformation and upgrading and an endogenous mechanism for the high-quality manufacturing development.

Some scholars advised to build new high-quality industrial cities to support the manufacturing transformation and upgrading. Zhejiang Province is the first precedent case. It plans to integrate its existing 1010 development zones (parks) into less than 150, highlight the development philosophy of “developing a city through industries, boosting industries with city support, and attracting talents to the city”, reform the management system of parks, and build a high-end industrial ecology that integrates the technology chain, entrepreneurship chain, talent chain, capital chain, service chain and industrial chain to support the transformation and upgrading and high-end growth of the manufacturing (Lin, 2020). This reveals the active exploration of local governments which should continue to draw upon past experience, deepen the pilot of reform and opening up and improve relevant policies and measures to combine the transformation and upgrading with high-quality development, so that an effective path that is sustainable and popularized will come into being.

At the new stage of development, in pushing forward the layout adjustment and coordinated development of regional manufacturing, whether it is to give full play to the comparative advantages of different regions, to drive the latecomers with the pioneer regions, or to construct the combined advantages among regions, we must follow the development pattern with domestic circulation as the mainstay and domestic and international circulations reinforcing each other and focus on smoothing the flow of factors and economic circulation among regions. Only in this way will each region continue to find more paths and space of manufacturing transformation and upgrading

based on their own realities and drive the high-quality manufacturing development in the long term.

4.2.4. Optimizing Business Environment to Fuel the Vitality and Driving Force of the Manufacturing

Building a business environment with international competitiveness is an essential requirement for the manufacturing transformation and upgrading under the new development pattern. Optimizing the business environment is conducive to stabilizing market expectations, enhancing market confidence and stimulating the vitality of market players. It will help to attract high-tech enterprises and high-quality capital from all over the world, introduce more high-end industries and advanced technologies, and support the manufacturing transformation and upgrading. From the perspective of forming a pattern with the domestic circulation as the mainstay, there needs to comprehensively improve the business environment for manufacturing enterprises—creating the competitive and orderly market environment, establishing the institutional environment to protect independent innovation, and improving the legal environment for business development. In the view of domestic and international circulations reinforcing each other, there needs to build the domestic business environment in line with global trends and characteristics and optimize the reasonable connection between the domestic business environment and the flow of international factors, including opening wider to the outside world, improving conditions for market access and the negative list management system, promoting a free flow of production factors, and guiding domestic enterprises to explore diversified international markets.

4.2.5. Enhancing International Circulation Relying on the Belt and Road Initiative (BRI)

China's manufacturing has engaged in the division of labor on global value chains by opening up. The ability to learn and imitate advanced technologies and its comprehensive utilization of resources in domestic and international markets are continuously improving. BRI is a breakthrough for China to improve its openness. In-depth partnerships with BRI neighboring countries or regions will help to optimize the allocation of resources in different regions of China, promote domestic circulation and international circulation and expand the paths of manufacturing transformation and upgrading. The construction of the new development pattern and BRI needs to be combined. While supporting the economic development of BRI neighboring countries or regions, China should

effectively allocate technology and capital, improve the utilization efficiency of domestic capital and technology, and expand new space for technological innovation and manufacturing progress. By the opportunity of BRI neighboring countries or regions to construct infrastructure, China should strive to open up new overseas markets and raise the level of domestic and international circulation reinforcing each other. Besides, with the help of regional economic integration agreements such as RCEP, China should open wider to the outside world, strengthen bilateral and multilateral industrial economic cooperation more comprehensively and deeply, and accelerate its manufacturing transformation and upgrading through technology transfer and knowledge spillover effects.

4.3. Theoretical Bases for Adjusting and Expanding Manufacturing Transformation and Upgrading Paths

“In the history of mankind, no nation or country will get strong and rejuvenated by relying on external forces and following others,” said General Secretary Xi Jinping.¹ Large economies with huge internal markets are able to mitigate external shocks and impacts by launching domestic demand on a large scale at the time when external markets are hit by crises. Speeding up the construction of the new development pattern with domestic circulation as the mainstay and domestic and international circulations reinforcing each other is inevitable for China’s economic development at a certain stage and is an active strategic adjustment to the changes in the external environment. It means the manufacturing transformation and upgrading must better adapt to the domestic and foreign environment at the new stage of development and under the new development pattern, focus more on people’s growing needs which are new and diversified, and make the supply chain on the industrial chains more resilient and stable.

With the countercurrent of globalization and the rise of international trade protectionism, especially the containment on China’s economy and technology by a few developed countries, the over-dependence on international circulation can enlarge the risks of manufacturing transformation and upgrading. Previous experience has shown that the developed countries’ strong control over global value chains and the unequal international division of labor have “locked” most developing countries, including China, in the low and middle ends of the value chains. Many manufacturing industries have long been subject to the control of others and could only obtain low added value in production and trade, which at last hinders the upgrading of industrial structure and sustainable economic development. For this reason, the paths of manufacturing transformation and upgrading in China at the new stage of development

¹ Xi Jinping: *The Governance of China (Volume I)*. Beijing: Foreign Languages Press, 2014, p. 29.

must be adjusted and expanded under the framework of constructing the new development pattern.

Generally speaking, in accelerating the construction of the new development pattern, the theoretical bases for adjusting and expanding the manufacturing transformation and upgrading are as follows.

4.3.1. New Requirements with Domestic Circulation as the Mainstay

The old paths of manufacturing transformation and upgrading are chosen and implemented in the old development strategy framework, which basically utilized the domestic and international markets and resources. The focus of China's development strategy gradually shifted to domestic markets after the global financial crisis in 2008, emphasizing growing domestic demand, especially consumer demand, reducing excessive dependence on external markets. However, the paths of manufacturing transformation and upgrading have not been shifted yet. Moreover, the issues like domestic market saturation and overcapacity remain prominent and manufacturing enterprises are still led more by international markets to seek the paths of transformation and upgrading. As the new development pattern turns to domestic circulation as the mainstay and the dependence on foreign markets, resources and technology is increasingly constrained, the manufacturing transformation and upgrading must change the oriented objectives and mechanisms as soon as possible and turn to the demand and supply of domestic markets, resources and technology as the mainstay. Manufacturing enterprises need to advance the transformation and upgrading by relying more on and expanding the large domestic markets and explore how to adjust the transformation paths and find new paths.

4.3.2. New Characteristics with Domestic and International Circulations Reinforcing Each Other

In the past, the manufacturing transformation and upgrading tended to go in two directions: one was to adjust the domestic production structure according to the developments of external market demand to be more internationally competitive, driving the manufacturing transformation and upgrading by growing exports; another was to adjust the industrial structure according to the upgrading of domestic consumption structure, driving the manufacturing transformation and upgrading with better supply structure and quality. The two basically went separately, adapting to the different needs of international markets and domestic markets respectively. There were few parts of the staggered development between the two and the interaction was not strong. However, the construction of the new development

pattern requires the mutual reinforcement of domestic and international circulations, which must be high-level and based on domestic circulation driving international circulation. The two directions must become one to reinforce each other. Then, under the new conditions, the two paths of manufacturing transformation and upgrading, which used to operate relatively independently, need to be adjusted, and new paths for the integrated development and mutual reinforcement must be found. Facing the uncertainties of the external environment and of the manufacturing development itself, there needs to enhance the exploration and forward-looking layout of cutting-edge technologies, improve the stability and modernization of the supply chain on the industrial chains, expand new paths of manufacturing transformation and upgrading on the basis of adapting to and utilizing the mutual reinforcement of domestic and international circulations, and effectively prevent possible security risks.

4.3.3. Facilitation of High-Quality Manufacturing Development and Medium-to-High Growth

The strategic idea of constructing the new development pattern, based on the new development stage and serving the “two centenary goals” in China, must be applied for the steady growth and high-quality development in the current and future periods. High-quality manufacturing development is the primary driver for the high-quality development of economy and plays an important role in stabilizing the growth. The manufacturing transformation and upgrading should meet what requires of the new development pattern, that is, it will contribute to the stable growth and high-quality development, as well as the high-quality, medium-to-high growth of the manufacturing. The paths of manufacturing transformation and upgrading should be adjusted and expanded for the goal of steady growth and high-quality development, so that the transformation and upgrading will play a greater role in the operation and development of the national economy. We must continue to rely on deepening the reform and opening up to release the driving force and vitality of development and deepen the supply-side structural reform to drive the industrial restructuring and upgrading, so that the adjustment and expansion of paths of the manufacturing transformation and upgrading are consistent and coordinated with the basic goal of developing manufacturing.

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