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Research on the Impact of the Development of Platform Economy on the Transformation and Upgrading of China's Manufacturing Industry

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Abstract

Since the 21st century, with the popularization of Internet technology, platform economy has risen rapidly as an emerging industrial form. Relying on the cross-temporal convenience of Internet technology, the development of platform economy has had a qualitative impact on social division of labor, industrial structure and economic growth mode. China is currently the world's largest manufacturing country, but is not yet a manufacturing power. Transformation and upgrading is the only way for China's manufacturing industry in the process of transforming from a big country to a strong one.How to accelerate the transformation and upgrading of manufacturing industry? The rapidly emerging platform economy seems to offer the answer.How does the development of platform economy affect the manufacturing industry? Does the development of platform economy have the same influence on manufacturing in different industries? In view of this, from the perspective of industrial upgrading, this paper explores the transformation and upgrading of manufacturing industry under the background of platform economy development. Based on the influence mechanism of platform economy on the transformation and upgrading of manufacturing industry and the status quo of the transformation and upgrading of manufacturing industry, problems encountered in the transformation and upgrading of manufacturing industry are found out, and relevant policy suggestions are put forward. This paper tries to provide new ideas for accelerating the transformation and upgrading of China's manufacturing industry and the new development pattern of supply chain optimization and upgrading.

Keywords

Platform Economy; Manufacturing; Transformation and Upgrading.

1. Research Background

Driven by the national strategy of "Internet Plus", platform economy has risen rapidly.Before 2009, Microsoft was the only platform company among the world's top 10 companies by market capitalization.As of April 2019, there are 7 platform enterprises among the world's top 10 enterprises by market capitalization.In January 2008, 8.8% of the world's top 10 enterprises by market value were platform enterprises;In April 2019, the market value of platform enterprises reached $4.88 trillion, accounting for 80.2 percent of the total, a 22.5 times increase from 2008.In the era of digital economy, platform is the infrastructure of economic development, platform enterprises have become the new driving force of economic growth, and platform economy has become the basic economic model of economic growth and new job opportunities.

At present, China's economy has moved from high-speed growth to high-quality development. After the 14th Five-Year Plan and the 2035 vision, all sectors of society are focusing on high-quality development.With the gradual disappearance of "demographic dividend" and "resource dividend", China's manufacturing industry is facing the pressure of transformation and upgrading.Lack of independent innovation ability and low technological level;Unbalanced

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industrial development and low added value of products;The limited capacity of supply chain logistics system, the lack of anti-risk ability and the lack of domestic demand have become the main bottleneck hindering the development of China's manufacturing industry.

The world is undergoing profound changes unseen in a century. The outbreak of COVID-19 and the new round of industrial and technological revolution have had a profound impact on the world economy.With the "reindustrialization" strategy launched by developed countries to reconstruct the competitive advantage of manufacturing industry and the rapid development of labor-intensive manufacturing industry in some emerging countries, China's manufacturing industry is suffering from "two-way" extrusion.How to accelerate the transformation of manufacturing industry has become an urgent problem to be solved.Platform economy, as the engine of information age growth, has made a significant contribution to social and economic development.Therefore, the power of the platform may promote the transformation and upgrading of China's manufacturing industry and break through the current development bottleneck.

2. Research Significance

2.1. Theoretical Significance

The optimization of industrial structure is an important force in the transformation and upgrading of manufacturing industry, but the platform economy, as an important factor in the integration of industrial chain, has seldom been paid attention to by scholars.It is only 30 years since the theory of platform economy was put forward. From the formation of the concept of platform to the maturity of relevant theories, it has been extended to the fields of management and economics.This project integrates platform theories in the two fields, focuses on the characteristics of platform economy and manufacturing production system, and studies the mechanism of platform economy to promote manufacturing transformation and upgrading as well as the empirical analysis of the impact of platform economy on manufacturing transformation and upgrading, so as to provide some reference for subsequent research.

2.2. Practical Significance

After more than 30 years of reform and opening-up, China has gradually become the world's largest manufacturer.The development of manufacturing industry is an important driving force of China's rapid economic development.However, China's manufacturing industry is still facing problems such as weak innovation ability and rough development mode.Most of China's manufacturing industry is at the low end of the industrial chain, low technology content, insufficient domestic demand, coupled with rising labor costs, many enterprises are in a difficult situation.In the context of the rapid development of information technology, the manufacturing industry began to seek the economic benefits provided by the platform to facilitate the transformation and upgrading.In this context, it is of great significance for the manufacturing industry in the exploratory stage to study how to realize transformation and upgrading through platform economy.

3. Research Status at Home and Abroad

3.1. Research Status of Platform Economy

At present, the academic circle has not formed a unified concept of platform economy, and the research on platform economy is still in its infancy. Many scholars discuss platform economy from the perspectives of competitive strategy, business model, platform pricing, network externalities and so on.These results are still in a state of fragmentation, without forming a concrete framework and system and obviously lag behind the practice of platform economy.

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3.1.1. Theoretical Basis of Platform Economy

After reviewing the literature, we found that the theoretical basis of platform economy started from two-sided market research (Evans, 2003;Armstrong and Wright, 2007), platform market refers to that both parties need to trade through the platform. The benefits of users joining the platform depend on the number of other parties joining the platform. Network externality is an important theoretical basis of platform market.In 2006, Xu Jin and Zhang Xiangjian proposed to adjust the cost bearing structure of both parties through market mechanism design to benefit both parties.Tirole research summarizes three elements of platform economy: two or more customers, network effect between different customers, and intermediary participation (Rochet and Tirole, 2003).

3.1.2. Research on Operation Strategy of Platform Economy

Rochet and Tirole (2003) took the sales link as the perspective and found that the platform could get more revenue through bundling.Choi (2010) found in his research that tie-in makes more consumers turn into multi-buyers, which makes profits for both sides of the platform and platform enterprises themselves.Bakos and Katsamakas (2008) considered that Internet intermediary enterprises generally have platform characteristics based on the research of platform customer recruitment strategy. This network usually has two participants, and one party will gain value due to the other party's joining.Resource heterogeneity creates competitive advantages of bilateral platforms and plays an important role in the long-term competitive development of platforms.

3.1.3. Research on Anti-Monopoly Strategies in the Field of Platform Economy:

With the rapid development of platform economy, some problems such as industry monopoly have gradually emerged.In view of the monopoly problem in the field of platform economy, optimized regulatory measures are proposed to promote the stable development of platform economy with a positive attitude (Zhou Yi, 2019).Zhang Yunping et al. (2021) suggest making full use of digital technology advantages, optimizing digital anti-monopoly tools, realizing effective governance of digital monopoly, and maintaining consumer welfare and market order.Zhou Xiao (2021) made an in-depth analysis of platform hegemony from the four dimensions of interconnection, data, computing power and algorithm, and proposed that legal innovation is the most effective means of anti-hegemony at present.

3.2. Research Status of Enterprise Transformation and Upgrading

3.2.1. Research on Concepts and Theories Related to Manufacturing Transformation and Upgrading:

Foreign theoretical research focuses on the transformation and upgrading mode of manufacturing industry.Gereffi (1999) first proposed the concept of manufacturing transformation and upgrading and divided it into four levels from the perspective of resource allocation, namely, international industrial transformation and upgrading, industrial transformation and upgrading within a country, industrial transformation and upgrading between different regions and industrial transformation and upgrading within the industry.On this basis, Humphrey (2002) divided industrial upgrading into four modes based on the analysis of global value chain: Product Upgrading, Process Upgrading, Inter-sectoral Upgrading, functional upgrading

By referring to the theory of industrial transformation and upgrading of foreign scholars, domestic scholars have done further research on the transformation and upgrading of manufacturing industry on the basis of global value chain analysis, and put forward relevant countermeasures and suggestions.For example, Zhang Hui (2004) systematically summarized the formation and research ideas of the global value chain theory, put forward suggestions on how to apply the value chain theory, and made theoretical innovations on the dynamic

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mechanism of the manufacturing global value chain theory.When analyzing Taiwan's computer industry, Mei Lixia, Nie Ming and CAI You (2005) proposed that the upgrading path of China's original equipment manufacturing value chain is manufacturing-design-brand, which is accompanied by the transformation from low cost to innovation and capital accumulation to technological innovation, thus achieving the upgrading of the value chain.

3.2.2. Motivation of Manufacturing Transformation and Upgrading:

In the process of transformation and upgrading of traditional manufacturing industry, some enterprises are slow in the process of transformation and upgrading due to the lack of transformation motivation and locked development path.Therefore, it is necessary to master the driving forces of the transformation and upgrading of the traditional manufacturing industry. By studying the driving forces of the transformation and upgrading of the manufacturing industry, we can find the driving forces of the transformation and upgrading of the traditional manufacturing industry, and then take better measures to accelerate the pace of the transformation and upgrading of the traditional manufacturing enterprises.Wang Jifa et al. (2006) found that the motivations for enterprise transformation and upgrading can be divided into endogenous and exogenous motivations. The endogenous motivation is that the non-optimization state of enterprise capacity and resources reduces the competitive advantage of enterprises, while the exogenous motivation is that the change of external market environment hinders the pace of enterprise growth.Vergrat & Brown(2006) believed that the government could adopt various policies and measures to promote enterprises to carry out independent technological innovation so as to realize transformation and upgrading, such as formulating incentive policies, increasing subsidies, providing tax incentives, and providing relevant guidance and suggestions to enterprises.Kong Weijie (2012) pointed out in his research that "enterprise size has a significant positive effect on enterprise transformation and upgrading, and government support is conducive to the transformation of enterprise types in non-market fields, while the effect of government administrative actions in market fields is not significant".

3.2.3. Research on Influencing Factors of Manufacturing Transformation and Upgrading:

When studying the factors influencing the transformation and upgrading of manufacturing industry at home and abroad, the research perspective and research methods are different, which are mainly carried out from internal and external aspects.The internal influencing factors of manufacturing transformation and upgrading mainly include enterprise structure, enterprise capacity, enterprise resources, enterprise scale, enterprise system culture, enterprise leader's personality preference, etc., while the external influencing factors mainly include the industrial environment, macroeconomic environment and government policy of the enterprise. Some scholars believe that resources play an important role in enterprises' competitiveness improvement and successful transformation. Enterprises' acquisition of key capabilities and mastery of key resources lay a foundation for enterprises' successful transformation and upgrading.Foreign research on factors affecting manufacturing transformation and upgrading pays more attention to green development and innovation. Fankhauser (2013) obtained the patent data of 110 manufacturing industries from 2005 to 2007 in eight countries, including the United States, Germany, The United Kingdom, France, Italy, South Korea, Japan and China, and concluded that one of the important factors affecting the transformation and upgrading of manufacturing industry is green innovation.Sezen et al. (2013) conducted a regression analysis on the questionnaire data of 53 companies in Turkey's automobile and chemical industries, and concluded that environmental innovation can positively affect the sustainable development of enterprises, and ecological innovation and green creation can promote the sustainable development of enterprises.Domestic studies on the influencing factors of manufacturing transformation and upgrading are diversified, but

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scholars generally focus on the impact of technological innovation and independent innovation on manufacturing transformation and upgrading, indicating the importance of innovation capability for manufacturing transformation and upgrading.Jin Bei (2011) put forward resource constraints in hindering the development of the industry at the same time can also be a pressure to promote the development of industrial transformation, and put forward the industrial transformation and upgrading involves many aspects, such as system, technology, ideas and interests, and form independent innovation is the most critical factors, especially the mechanism will be conducive to the core of technological innovation system.

3.3. Relevant Studies on Platform Economy and Manufacturing Transformation

There are few literatures about platform economy and manufacturing transformation, but the academic opinions are relatively consistent. Peng Shiyan (2017), based on the modular division of labor mechanism, open innovation mechanism, market competition forcing mechanism and trust cooperation mechanism of platform economy, concluded that platform economy can promote personalized and intelligent development of manufacturing industry, reduce cooperation cost, make platform network more malleable, and promote the transformation and upgrading of manufacturing industry as a whole.From the perspective of economic transformation and development, Peng Zhang (2014) proposed that platform economy should be vigorously developed to promote the construction of modern market system and sustainable industrial innovation. While leading the growth of emerging economies, platform economy promoted the integrated development of manufacturing and service industries, and innovated consumption patterns to a certain extent.Jiang Xin (2020) combined the platform theory from the perspective of management and economics and proposed the transformation and upgrading path of manufacturing platform by using profit model and case analysis.Obviously, the academic community is generally optimistic about the relationship between platform economy and manufacturing transformation: the rapid rise of platform economy brings opportunities for manufacturing transformation.

To sum up, from the perspective of influencing factors, although there are many factors affecting the transformation and upgrading of manufacturing industry, information technology represented by the Internet has attracted the attention of scholars.Secondly, the optimization of industrial structure is an important force in the transformation of manufacturing industry, while the platform economy, as a key promoter of the comprehensive integration of industrial chains, has rarely been paid attention to by scholars.Finally, the current research on the transformation of manufacturing industry by platform economy mostly stays at the theoretical level, lacking quantitative analysis.This project tries to deepen and improve the existing theoretical results by constructing the index system of platform economy development level and manufacturing industry transformation and choosing the fixed effect regression model for empirical analysis.

4. Theoretical Mechanism

4.1. The Modular Division Mechanism Promotes the Process Upgrading in Manufacturing Industry

With the deepening of economic globalization, the mode of social division of labor in manufacturing industry begins to change to modularization around the different value-added functions of value chain.Different from the traditional profit-oriented social division of labor, modular division of labor is an economic system with consumer value maximization as its core.Under the modular division of labor model, the continuous production process of traditional manufacturing industry is divided into several relatively independent modules, which are designed and produced in the most efficient countries (or regions) in the world, and

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then form the final product through the modular integration of platform integrators.In the whole industrial chain, suppliers of homogeneous modules and heterogeneous modules are interwoven together to form a complex network platform. Through competition between each other, module suppliers are encouraged to improve their technical capabilities and upgrade the manufacturing process.

From the perspective of benefit acquisition, the deepening of social division of labor enables manufacturing enterprises to get rid of complex production processes and devote more resources to the research and development of new technologies and processes.Horizontally, economies of scale can be achieved through specialized production in a market segment, while vertically, economies of scope can be achieved by providing diversified products through modular integration, thus reducing the production cost of modular products.From the perspective of the coordination of modular division of labor between modules independently form the relatively independent division of knowledge, the module supplier to provide basic data on the platform of network, the core technology of module products has the relative property right to independence, so as to accelerate the spread of new technology or new process, and reduce the module manufacturer's specific investment, To decouple enterprise scale from production capacity, reduce entry barriers for enterprises, make more enterprises focus on market segments, improve professional technology level, and promote the upgrading of manufacturing process.

4.2. Open Innovation Mechanism Promotes Product Upgrading in Manufacturing Industry

By introducing, digesting and absorbing external knowledge and technology, Chinese manufacturing enterprises improve their own technical capabilities and complete the original accumulation.At present, the transformation and upgrading of China's manufacturing industry requires enterprises to improve their innovation ability through independent innovation.The platform network provides an open channel for the manufacturing industry to exchange and communicate innovative information resources, thus promoting the improvement of the manufacturing product innovation ability.From the perspective of innovation incentive, the explicit knowledge absorbed by technology diffusion has a certain publicity, which reduces innovation cost.Module suppliers accumulate tacit knowledge through specialized production, so as to increase innovation benefits, stimulate the innovation enthusiasm of module suppliers, and promote module innovation.After module suppliers achieve innovation, they can shorten the whole product research and development cycle and achieve customized production through the combination of different modules, which not only meet the personalized needs of the market, but also promote the product upgrading of the manufacturing industry and better realize the maximization of consumer value.

4.3. Market Competition Mechanism Promotes the Function Upgrade of Manufacturing Industry

In the platform economy network, end users, application service developers and competitive platform enterprises composed of numerous module manufacturers and module integrators form the network market structure.Relatively speaking, competitive platform enterprises and application service developers are facing strong market competition in their own fields, and end users are the direction of guiding market supply.For competitive platform enterprises and application service developers with core technologies, they have obvious competitiveness in their own fields, while enterprises lacking core technologies mainly rely on low cost and rapid delivery to compete.In the competition between platform enterprises, the platform network coordinates the most advantageous enterprises in each module to form the platform value network, so as to maximize the value of enterprises and the whole industrial chain, thus promoting the functional upgrading of manufacturing industry.

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From the perspective of competition pattern, the development of information technology enables module suppliers to obtain more latest industry trends at a lower cost through the information sharing of platform network, so as to adjust the enterprise's own business strategy and research and development direction, reduce the cost of information search, improve the ability of information processing, shorten the product research and development cycle; At the same time, the economic development of the platform also provides manufacturers with a broader market, through the modular division of labor to reduce manufacturing enterprise in the enterprise scale and financing barriers to entry, by introducing, digesting and absorbing the integrated innovation to improve their own technical ability, help enterprise at a lower cost into the global industrial chain.This also provides rare development opportunities and space for some relatively small enterprises in China with specialized module technology in a certain market segment, and helps more Chinese manufacturing enterprises to integrate into the competition of the global industrial chain.

4.4. Trust Cooperation Mechanism Promotes Industrial Chain Upgrading of Manufacturing Industry

Platform economy is a new form of business brought by the rapid development of information technology. Affected by institutional innovation, the relatively loose platform economy model lacks institutional constraints for the time being. However, the trust and cooperation mechanism formed by informal institutions plays a very important role in promoting the development of platform economy In the platform network, in the process of modular division of labor and cooperation, platform enterprises establish an informal trust cooperation mechanism to reduce uncertainty and transaction costs, improve the external association ability of platform enterprises, so as to promote the industrial chain upgrading of manufacturing industry From the perspective of platform network structure, the deepening of specialization reduces the input cost of module suppliers' specific assets and makes their cooperation more flexible. Loose platform economic network also provides space for the development of third-party service intermediaries.

5. Conclusion

Based on the above analysis and conclusions, the development of new phase should stand at the height of strengthen entity economic development, stick to the supply side of structural reforms "to consolidate, enhance and improve, open" eight policy, increase investment in economic development platform, consolidate and promote the development of the manufacturing structure and level, attaches great importance to mutual platform for the coordinated development of economy and the transformation of the manufacturing.

(1) Enhance the strength of scientific and technological innovation to lead the coordinated development of the two.The scientific and technological innovations closely related to the platform are transformed into achievements and introduced to the production, supply and consumption ends of the manufacturing industry, so as to guide enterprises to speed up the pace of the development of the platform and guide the transformation from "Made in China" to "Made in China".

(2) Consolidate the achievements of supply-side structural reform.We will deepen the integrated development of next-generation information technology, represented by platforms, big data and artificial intelligence, with manufacturing.Through the integration of technologies such as the platform, the production cost of enterprises can be comprehensively reduced. Meanwhile, the combination of online and offline sales of products can be accelerated through the platform to effectively promote the reduction of capacity, inventory and cost.

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(3) To smooth the integration of the two development environment.Should be about to carry out the party's 19 big spirit and the central economic conference to deploy, new era of socialism with Chinese characteristics in jinping thoughts as the instruction, to deepen economic and manufacturing platform transformation fusion as the main line, in order to improve the supply quality measurement as the main direction, improving manufacturing innovation ability, the allocation of resources efficiency and total factor productivity, to build a good development environment for the fusion development.

(4) Strengthen the supporting force of policy support for the integrated development of the two increase the main construction of enterprises for the integrated development of the platform and advanced manufacturing field, give full play to the leading role of backbone enterprises in the transformation of the Internet through the introduction and cultivation of transformation and development and other ways to cultivate a group of intelligent manufacturing enterprises that stand up and stand up At the same time, strengthen the construction of relevant professional talent team for the integration development of policy support platform and manufacturing industry, and strengthen the support in key fields, such as the construction of industrial platform manufacturing and platform integration technology platform In addition, we should strengthen the construction of integrated development system, promote the integration and innovative application of manufacturing and big data, and establish a new data-driven manufacturing system to build an industrial Internet technology innovation system.

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