

Analysis of the development of China's fresh agricultural products e-commerce platform based on Marx's production and circulation theory

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Abstract. The key problem of agricultural production is to realize the value of agricultural products. At present, the actual circulation of agricultural products in China is restricted by various problems. In response to the question of how to better smooth the circulation system of agricultural products in the context of the normalized management of the epidemic and the digital economy, Chinese academics are currently more inclined to use economic principles to study and answer it. This paper uses an indirect research method, combined with the theory of production and circulation in Marxist political economy, to try to analyze the development direction of China's agricultural products circulation system under digital inclusion. The critical factor for advancing the transformation and upgrading of China's agricultural goods circulation system is in the reduction of circulation time and costs, hence enhancing the efficiency of agricultural product circulation. Hence, it is imperative to proactively cultivate novel rural e-commerce models alongside enhancing the conventional agricultural product circulation system. This entails encouraging diverse stakeholders to actively engage in the establishment of a contemporary agricultural product circulation system under government guidance, while also enhancing the organization and digitization of agricultural product distribution.

Keywords: Circulation of agricultural products, Theory of production and circulation, Circulation time and circulation costs.

1. Introduction

The primary challenge in agricultural production is in the effective realization of the value associated with agricultural products. Nevertheless, the circulation of agricultural products in China has faced certain limitations due to the unique nature of these items and the drawbacks of the existing distribution system, such as information asymmetry. The research focus has shifted towards investigating the potential of utilizing online e-commerce platforms to expedite the movement of agricultural products, owing to the swift advancement of Internet information technology. Currently, the focus of research on the dredging of circulation channels for agricultural products in China primarily lies at the intermediate and micro levels. This study primarily examines ways to address issues within specific components of the agricultural product circulation system. This study focuses on Hema Xiansheng, which is China's pioneering new retail platform that utilizes data and technology. By employing Marx's theory of production and circulation, this paper aims to analyze the existing issues within Chinese agricultural commodities circulation system. The research will adopt a micro-to-macro approach to investigate the specific case and subsequently explore the potential development trajectory of Chinese agri-products system within the context of digital inclusion. The ultimate goal is to offer guidance for enhancing the efficiency and effectiveness of China's agricultural products circulation system.

2. Analysis of Specific Cases

The term "circulation of agricultural products" encompasses the comprehensive process by which agricultural products are transported from the producing field to the consuming field [1]. The process of distributing agricultural products connects the two major links of production and consumption,

which not only involves the satisfaction of consumers' needs, but also affects farmers' income. At present, China has a low level of development in this field. The loss of agricultural products in the circulation process is large, and the production of circulation costs will increase the cost of agricultural products, which will cause changes in the price of agricultural products, thus affecting the realization of the value of agricultural products and resulting in problems such as "high yield and poor harvest." Hence, the facilitation of unobstructed routes for the circulation of agricultural products can significantly contribute to the farmers' ability to fully realize the value of their agricultural products. This has significant relevance in enhancing the overall efficiency of agricultural production.

Since its inception in 2015, Hema has restructured the retail industry "people, goods and farms". It has created new business formats such as "Hema Fresh Produce" and "Hema X Member Store," and has objectively accelerated the distribution of newly harvested agricultural commodities in China's economically underdeveloped regions by proposing a "new supply" relationship and providing assistance to production areas. Marx posits that the realization of the value of things is contingent upon the conduct of consumers within the market. By employing big data analysis, Hema comprehends the purchasing patterns and requirements of consumers, thereby facilitating the provision of tailored services to consumers. Consequently, this approach enhances the sales and value actualization of items. Hema Xiansheng's innovative integration of online and offline strategies in the realm of "new retail" not only restructures the industrial chain, but also presents novel insights for overcoming the challenges in the context of the movement of agricultural products.

3. An examination of the present state of China's agricultural product circulation system

This paper chooses Marx's theory of production circulation as the theoretical support for the analysis of the current situation. In Marx's view, selling (W-G) is the change of the first form of product, which is vividly called "the breathtaking leap of product". For product producers, to realize the value of commodities, it is necessary to complete this "breathtaking leap". Under the condition of product economy, the labor of product producers is manifested as the unity of opposites between private labor and social labor [2], which makes the realization process of product value embodied in his / her private labor can be fully recognized by society. Applying the theory to the circulation of agricultural products, the labor of product producers is first manifested as private labor, and the value of the commodities produced by them can be confirmed only through market exchange. At the same time, whether private labor is transformed into social labor, also affects the realization of product value or not [2]. If it is not fully recognized by society, the inherent contradictions of commodities will still exist, and their value will be difficult to be fully realized, and the producers themselves will not be able to fully compensate for the consumption generated by their labor, and the reproduction process will not be able to continue. Therefore, the completion of the process of selling is more important to the producer of the product than buying. Especially for farmers, there are certain risks in the agricultural supply chain, once this jump cannot be achieved, farmers' income will not be guaranteed.

The realization of the transformation process from private labor to social labor must go through the process of circulation and consumption. Marx explained the realization time of this transformation process by discussing the circulation time.

After dividing the residence time of capital into production time and circulation time, Marx further demonstrated the negative correlation between circulation time and capital appreciation from the dialectical relationship between the two: when the production time is determined, the longer the circulation time, the longer the cycle of social reproduction, the slower the speed of social reproduction [3], and the capital circulation will enter a state of involuntary stagnation. In particular, commodities with prominent natural attributes have natural attributes that affect the length of their circulation. The easier it is for a product to go bad, the more quickly it must be consumed, that is, the

more quickly it must be sold. And the less distance it can have from its place of origin, the narrower its sphere of circulation, and the more local the market becomes [4]. In agriculture, the natural attributes of fresh agricultural products are prominent. Because of its high-water content, short shelf life and other characteristics, once the circulation is blocked and circulation time is too long, the use value of agricultural products will be lost, and the value of its realization may be greatly reduced, which will affect the social reproduction of agricultural products.

In addition to the circulation time, the circulation cost also plays a vital role in completing the "breathtaking jump of commodities". Marx further discussed the impact of circulation costs on the value of commodities, and divided the circulation costs into two types: pure circulation costs and productive circulation costs. Productive circulation costs specifically include storage costs and transportation costs.

First of all, Marx starts with product reserves to discuss the storage costs. Marx highlighted that during the transitional phase between the production process, from which it originates, and the consumption process, into which it is incorporated, the product assumes the role of a commodity reserve [5]. Product producers in the process of keeping such reserves always inevitably need certain storage costs. In this process, abnormal reserves generated by the cost cannot be compensated by value, which will cause value loss. Secondly, Marx pointed out two tendencies of transportation cost: with the development and improvement of communication and transportation means, transportation cost per product will decrease. However, due to the improvement of transportation capacity, product circulation has broken through the original geographical restrictions, and the product sales market has been expanded, which lets transportation costs show the overall growth trend. Hence, in order to ensure a consistent output and market availability of agricultural commodities, it becomes imperative to implement systematic planning and administration of the agricultural goods distribution system.

China's agricultural product circulation system has made significant advancements since the implementation of reform and opening up policies. These advancements can be attributed to increased investments from various government agencies, the emergence of new agricultural organizations, and the enhancement of infrastructure. The aforementioned variables have collectively contributed to the project's success. The agricultural goods wholesale network has been successfully established, leading to a progressive increase in the number of participants. As a result, the sector focused on the distribution of agricultural products has achieved significant progress in its efforts to achieve further development. China has implemented a multi-tiered and multi-channel market structure to enhance the distribution of agricultural goods [6]. In recent times, China has made significant efforts to facilitate the development of rural e-commerce and improve the existing agricultural product distribution system, in light of the advent of new internet technologies and the widespread integration of information technology. This endeavor is a component of China's Belt and Road Initiative, which seeks to establish a more integrated global community through the utilization of information and communication technology. Large-scale e-commerce platforms have the potential to overcome the initial sales limitations by effectively leveraging their information technology capabilities and formulating a novel agricultural product distribution plan. There is a notable surge in the growth of contemporary logistics distribution facilities dedicated to agricultural products. However, there continue to be some challenges pertaining to the main body, technology, and distribution channels of agricultural products in China.

Firstly, in terms of circulation channels, the traditional circulation channels are too single. At present, China's agricultural products are still mainly traded and circulated through the wholesale market. However, the traditional circulation system dominated by this is not only loose in each link, but the overall system is too large, resulting in a low degree of organization of the system, and the phenomenon of layer-by-layer price increase in the circulation process is more frequent, which compresses farmers' own profit space. The circulation efficiency of agricultural products in China is somewhat constrained by the significant transaction costs associated with them. Simultaneously, the intricate nature of this circulation process also gives rise to a dispersion of market circulation information, so impeding the efficient circulation of agricultural products. Once the circulation of

agricultural products enters a state of involuntary stagnation, it will not only increase the transportation cost of farmers but also cause agricultural products to rot and affect the realization of the agricultural products' value.

Secondly, in terms of circulation main body, the proportion of individual small farmers mainly based on traditional planting methods is still relatively high. These farmers have relatively small planting scale, high unit labor costs, and lack of market competitiveness. In addition, the management of individual small farmers is more dispersed, their anti-risk ability is poor, and the output of agricultural products produced by them is easy to fluctuate, so it is difficult to form economies of scale. From the perspective of market circulation, due to the inability to fully grasp the market information, Individual farmers cannot respond to changes in the market situation in time and will be prone to speculative production behavior, which will cause a contradiction between supply and demand of agricultural products, resulting in some types of agricultural products unsalable and "abnormal reserve" situation, and then restrict the circulation of agricultural products.

Finally, in terms of circulation technology, the mode of transportation of agricultural products in China at this stage is still dominated by ordinary normal temperature transportation, which restricts the further development of the circulation system. At present, China's cold chain system is not perfect, the layout of infrastructure is unreasonable, and the development of cold chain technology itself is relatively immature, and cold chain transportation technology is not fully promoted. Research shows that the current circulation rate of China's cold chain is only 5%, and about 90% of fresh fruits, vegetables and their products have not yet entered the cold chain environment [7]. And the normal temperature mode of transport makes it easy to limit the supply of agricultural products. The transport of agricultural products has to go through the intermediate links of layers of circulation. In this process, due to the long transit period and the normal temperature transport, some agricultural products are prone to decay before they enter the consumer market. The circulation of agricultural products will be affected by the high percentage of loss of agricultural products and reduced supply of agricultural products.

4. Corresponding solutions

China's agricultural product circulation system is constantly improving and developing, as can be seen through the analysis above. By contrast, the lack of popularity and low degree of organization of cold chain logistics technology are still a concern. With the post-epidemic era of risky society put forward new requirements for the agricultural products circulation system, and it is urgent to take multiple measures to smooth the agricultural products circulation system. O2O, B2C, and other models are slowly emerging in China's agricultural products circulation system due to the gradual integration of Internet technology and all aspects. Rural e-commerce could be developed first to improve the information level of circulation in the digital economy to achieve smooth agricultural product circulation. Secondly, while building an e-commerce platform, the construction of farmer cooperatives is essential to enhance the traditional circulation system. Finally, the government could introduce relevant policies to consolidate infrastructure construction and support the further development of related industries in the field of agricultural product circulation.

Prioritizing the development of e-commerce platforms tailored to agricultural items and augmenting the level of digitalization in the distribution of agricultural commodities are of utmost importance. The progression of science and technology has the potential to enhance productivity, particularly within the digital economy. E-commerce is significantly contributing to the evolution of China's consumer sector. Based on the 2022 National Economic and Social Development Statistics Bulletin, it is reported that the yearly online retail sales of tangible items in China amounted to 1,196.42 billion yuan, representing a proportion of 27.2% in relation to the overall retail sales of consumer goods. Based on a comparative analysis, there is a recorded growth of 6.2% in relation to the preceding year [8]. The implementation of innovative rural e-commerce models has the potential to enhance farmers' understanding of market demand, predict market development trends, reduce

farmers' reliance on speculative production methods, and improve the efficiency of distributing agricultural products across different locations. The case study of Hema Xiansheng highlights the establishment of the first "Hema Village" in the province of Sichuan, China, in 2019. Furthermore, it has substantially improved the connection between the supply and demand of agricultural products within the local region, while also serving as a platform for direct sales from production areas. In addition, the prevalence of major platforms in the market has played a crucial role in enabling the growth of rural e-commerce beyond the constraints of regional transactions [9]. By expanding the range of agricultural product trading, the platform's brand influence can enhance direct market and supply integration, while reducing losses suffered during several transportation stages of agricultural products. The implementation of rural e-commerce platforms can contribute to the assurance of agricultural product quality to a certain degree. This is achieved through the verification and traceability of agricultural products throughout the whole production and sales process, thereby promoting the standardization of China's agricultural sector. Hence, the establishment of rural e-commerce platforms can effectively leverage Internet technology to eliminate the multi-layer marketing system, thereby reducing the number of intermediaries involved and minimizing circulation costs. Additionally, the utilization of logistics platforms can enhance the efficiency of the logistics process, consequently leading to a reduction in costs associated with product circulation. Therefore, it is crucial to fully leverage the advantageous effects of rural e-commerce platforms in order to optimize the efficiency of agricultural product distribution.

Another approach is fostering the establishment of farmers' cooperatives alongside the advancement of rural e-commerce platforms. Farmers' cooperative is an economic organization formed by voluntary participation, based on the principle of equality and registered according to law [10]. Its biggest advantage is that it has a certain scale effect, which can effectively integrate farmers' resources, collect market demand, and realize large-scale production and centralized and unified sales. The reduction of "information asymmetry" in agricultural product marketing can be achieved through the establishment of farmer cooperatives. Additionally, the presence of scale effects allows member units to collectively utilize logistics, warehousing, sales, and other services, thereby enhancing the assurance of agricultural product quality and safety. Compared with the small-scale and decentralized management of individual farmers, farmers cooperatives can help farmers break the information barriers, and at the same time, they can also establish regional agricultural product brands with their advantages to increase the attention of local agricultural products. Farmers' cooperatives have sufficient funds to develop organic agriculture, The possibility of green agriculture, not only can save planting costs and improve farmers' income, but also can formulate a unified quality standard in the development process, guide farmers to carry out standardized production, ensure the quality and safety of agricultural products to better accelerate the circulation of agricultural products. In areas where rural e-commerce has not yet been fully covered at this stage, Farmers cooperatives can also play its special advantages, based on their divergent market network, as far as possible to expand the circulation channels, build a bridge between agricultural products circulation and trade, reduce circulation links, provide new opportunities for the circulation of agricultural products.

Finally, there exists the potential for the government to actively facilitate the modernization and improvement of the current system. So as to optimize the distribution of agricultural commodities, it is crucial to collaboratively advocate for a wide array of concerns, with the government playing a central role. The agricultural products logistics system and its associated storage facilities necessitate specific technical requirements due to the susceptibility of agricultural product production to external disruptions, the inherent instability of output, and the time-limited perishability of agricultural products. When creating policy, the government may take into consideration the following issues. To begin with, it is imperative to advocate for the adoption and enhancement of cold chain technologies, while concurrently enhancing the reach and efficacy of cold chain logistics infrastructure. Additionally, it is imperative to enhance the oversight and control over the distribution channels of crucial agricultural commodities. This entails the establishment of a robust information dissemination mechanism that safeguards consumers' entitlement to access relevant information [11]. The third

recommendation is to incentivize firms to allocate additional financial resources towards the distribution of agricultural products and to investigate novel approaches, such as expanding cold chain logistics and boosting the integration of the internet with agricultural practices. Capital is profit-driven, and the investment return cycle in infrastructure construction is long, so the government needs to introduce relevant policies to encourage and guide capital to enter relevant industries. The fourth step involves enhancing infrastructure development, encompassing the expansion of optical fiber networks in rural areas, modernizing agricultural distribution facilities, and promoting the standardization of agricultural products. Through policy guidance, agricultural product circulation system could be promoted, allowing for the unhindered flow of agricultural products from rural to urban areas, meeting the needs of consumers of various levels and needs, and accelerating the circulation speed of agricultural products entering the market.

5. Conclusion

From the foregoing analysis, it can be seen that circulation costs and circulation time affect the realization degree of product value, especially for fresh agricultural products with outstanding natural attributes, once its circulation is blocked and circulation time is too long, the realization degree of its value may be greatly reduced.

Thus, to boost the efficacy of agricultural product distribution, the key to progressing China's agricultural product circulation system lies in minimizing both circulation duration and expenses. Given the contextual framework of digital inclusion, it is imperative to enhance the conventional method of agricultural product circulation as a prerequisite for ensuring the efficient functioning of China's circulation system. In order to enhance the conventional distribution system of agricultural goods, it is imperative to aggressively foster novel models of rural electronic commerce. The active involvement of the government is crucial in facilitating the construction of a modern agricultural commodity recirculation system by providing advice to diverse stakeholders. This involves improving the organizational and informational components of the agricultural product distribution process, while also eliminating any obstacles present within the distribution system. Consequently, the development of agricultural industrialization will be propelled.

This study aims to offer insights into streamlining China's agricultural product circulation and scrutinizes existing challenges concerning distribution costs and time. However, there are certain constraints to this research. The methodology leans more towards indirect analysis, with minimal focus on tangible entity assessment. This work utilizes an indirect research approach, with limited emphasis on entity examination. The next step is to supplement and adjust the research data through specific practical investigation, so as to provide more accurate analysis data for this study.

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