

A STUDY ON THE COMPLEMENTARITY OF AGRICULTURAL TRADE BETWEEN CHINA AND VIETNAM

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Abstract: This paper aims to analyze the complementarity of agricultural trade between China and Vietnam and explore its impact on bilateral economic cooperation. The study employs theories of comparative advantage, complementarity, and intra-industry trade, combining trade data and policy contexts to examine the complementarity and cooperation potential of agricultural products such as rice, coffee, and tropical fruits between the two countries. The results indicate that Vietnam holds significant comparative advantages in the production of tropical agricultural products, while China dominates in agricultural production materials and technology, establishing a strong complementary relationship in agricultural trade. Policy support, particularly the implementation of the Regional Comprehensive Economic Partnership (RCEP), has accelerated the growth of agricultural product trade between the two nations. The study concludes that the complementarity of China-Vietnam agricultural trade is significant but requires further optimization of supply chain management and enhancement of product value-added to address future competition and challenges.

Keywords: China-Vietnam trade; Agricultural trade; Comparative advantage; Intra-industry trade; RCEP

1 INTRODUCTION

China and Vietnam are two significant agricultural producers in the Asian region, and their agricultural trade relationship has developed remarkably over the past decades. Due to clear complementarities in climate conditions, geographical locations, and agricultural resources, agricultural trade cooperation between China and Vietnam has a natural foundation. Particularly in areas such as rice, tropical fruits, rubber, and coffee, Vietnam has become an important supplier of agricultural products to China, leveraging its unique natural conditions, while China provides Vietnam with a vast consumer market [1]. Agricultural trade has not only promoted economic cooperation between the two countries but also contributed to maintaining regional food security. Since the establishment of the China-ASEAN Free Trade Area (CAFTA) in 2010, the volume of agricultural trade between the two nations has significantly increased. Vietnam's tropical fruits, rice, and aquatic products have rapidly entered the Chinese market by reducing tariffs and trade barriers. For example, Vietnamese durian, bananas, and passion fruits have captured substantial market shares in China. With the implementation of the Regional Comprehensive Economic Partnership (RCEP) in 2020, the depth of China-Vietnam agricultural trade cooperation has been further strengthened. China and Vietnam have mutually reduced tariffs on agricultural products by over 90%, laying a solid foundation for further cooperation in the field of agricultural trade in the future [2].

From specific trade data, in 2020, China imported nearly \$4 billion worth of agricultural products from Vietnam, compared to less than \$800 million a decade earlier [3]. Among the agricultural products exported by Vietnam to China, rice and coffee constitute a significant proportion. These products not only meet China's growing market demand but also promote the modernization of Vietnam's agricultural industry. Conversely, China's exports of agricultural machinery, fertilizers, and other agricultural production materials to Vietnam provide technical support and material guarantees for the modernization of Vietnam's agriculture.

The deepening of China-Vietnam agricultural trade relations is driven not only by the market demands of both sides but also benefits from policy-level support. For example, Guangxi, as a frontier province for China-Vietnam agricultural trade, has further facilitated bilateral trade by strengthening infrastructure construction and optimizing border clearance efficiency [4]. Additionally, both governments actively engage in agricultural technology exchanges, especially in areas such as cultivation techniques, pest and disease control, and supply chain management. These collaborations have not only improved agricultural production efficiency but also created larger market spaces for both parties.

However, the development of China-Vietnam agricultural trade also faces several challenges. Firstly, there exists competition between the two countries in certain agricultural product sectors, such as market share competition in rice and fruits, which could impact trade balance. Secondly, in terms of supply chain management and product standardization, both sides still need to overcome certain technical barriers to ensure uniformity in agricultural product quality and market entry standards. The rational use of pesticides and fertilizers plays a crucial role in agricultural production, directly affecting the quality of agricultural products and environmental sustainability. In agricultural technology cooperation, the two countries can collaborate on the application of green pesticides and environmentally friendly fertilizers to reduce their negative impacts on the environment and human health [5]. In the future, enhancing the value-added of agricultural products, deepening technological cooperation, and optimizing the trade structure remain key to the further development of China-Vietnam agricultural trade.

2 LITERATURE REVIEW

Research on the complementarity of agricultural trade between China and Vietnam has established a relatively extensive literature base, covering areas such as competitiveness analysis, complementarity theory, and policy impacts. Many scholars have revealed the characteristics and potential development directions of agricultural trade between the two countries through theoretical frameworks and empirical analyses.

Firstly, the theory of comparative advantage is an important foundation for explaining China-Vietnam agricultural trade. According to this theory, countries should focus on producing products in which they have a relative advantage and exchange for other countries' advantageous products through international trade to maximize economic benefits. Vietnam possesses significant comparative advantages in agricultural products such as rice, coffee, rubber, and tropical fruits, particularly rice and coffee, which have long been its main export products [6]. Meanwhile, China has clear comparative advantages in agricultural machinery, fertilizers, and other agricultural production materials, providing necessary support for the modernization of Vietnam's agricultural production [7]. Existing research indicates that as China's demand for Vietnamese agricultural products continues to increase, Vietnam's export volume of these advantageous products has grown year by year, making the agricultural trade between the two countries highly complementary. In this context, the quality and sanitary inspection standards of agricultural products have become key elements in ensuring smooth trade between both parties. Especially in the protection and rational use of crop genetic resources, effectively enhancing agricultural product quality and reducing the spread of pests and diseases further strengthens the stability of bilateral trade [8].

Secondly, the theory of trade complementarity offers another perspective for analyzing China-Vietnam agricultural trade. This theory examines whether there exists a complementary relationship between the production and demand of different product sectors in two countries, thereby driving the growth of bilateral trade. Many studies have analyzed the current state of China-Vietnam agricultural trade using the Trade Complementarity Index (TCI), with results indicating strong complementarity in certain agricultural products between the two countries, especially in tropical fruits, aquatic products, and coffee [9]. For instance, China has a higher demand for tropical fruits during specific seasons, and Vietnam, as a major producer of tropical fruits, can effectively fill the supply gap in the Chinese market for such products [10]. This complementarity not only enhances the stability of agricultural trade between the two countries but also lays the foundation for future deepened cooperation. Moreover, research suggests that there is potential to further explore complementarity in other areas, such as the production and consumption of aquatic products, tea, and rubber between China and Vietnam [11].

In addition to complementarity, the theory of intra-industry trade also holds significant importance in the study of China-Vietnam agricultural trade. Intra-industry trade refers to the production and trade activities of the same category of products between two countries. This trade pattern involves not just the exchange of completely different products between countries but also the bidirectional flow of similar products. A typical example of intra-industry trade in China-Vietnam agricultural trade is fruit trade. While Vietnam exports large quantities of tropical fruits to China, China also exports certain northern fruits and processed foods to Vietnam [12]. This intra-industry trade helps to enhance the efficiency of cooperation between the two countries and avoids the risks of market fluctuations associated with single-industry trade.

In analyzing the competitiveness of agricultural trade, indicators such as Revealed Comparative Advantage (RCA) and Export Similarity Index (ESI) have been widely applied in empirical studies of China-Vietnam agricultural trade. Through the calculation of RCA and ESI, scholars have found that the two countries exhibit similarities and competitiveness in the export of certain agricultural products [13-14]. For example, both Vietnam and China hold certain shares in the rice market, leading to a degree of competition in the global market [15]. However, overall, the coexistence of competition and complementarity provides a more complex foundation for China-Vietnam agricultural trade cooperation. Particularly in the rice sector, although there is competition in export markets, there remains room for cooperation in processing technology and supply chain management [16].

Policy-level support is another crucial factor driving the rapid development of China-Vietnam agricultural trade. In recent years, with the implementation of regional trade agreements such as the China-ASEAN Free Trade Area (CAFTA) and the Regional Comprehensive Economic Partnership (RCEP), the tariff barriers on agricultural products between China and Vietnam have gradually decreased, and market access conditions have significantly improved. The implementation of these trade policies has greatly facilitated the circulation of agricultural products between the two countries, especially in high-demand sectors such as tropical fruits and aquatic products. Furthermore, the potential for cooperation in the field of food safety between the two nations should not be overlooked. Through policy coordination in areas like food quality inspection and pesticide residue testing, both parties can jointly elevate the safety standards of agricultural products, thereby enhancing their competitiveness in the international market [17]. For example, after Vietnamese durian was approved for entry into the Chinese market in 2022, its export volume rapidly increased, becoming a "new favorite" in the Chinese market [18]. Additionally, border regions such as Guangxi have accelerated the clearance speed of perishable agricultural products by constructing more efficient customs facilities, further enhancing the efficiency of cross-border agricultural trade.

Existing literature also highlights some challenges present in China-Vietnam agricultural trade. Although the two countries have complementarity in many agricultural products, competitive relationships in certain sectors still warrant attention. For example, in the rice market, while both nations hold significant positions globally, fluctuations in supply and demand may affect the trade balance between them. Additionally, in terms of product standardization and supply chain management, China and Vietnam need to further coordinate to ensure consistency in the quality and safety standards of exported agricultural products [19]. Scholars recommend that in the future, China and Vietnam should

strengthen cooperation in agricultural technology, supply chain optimization, and product processing, enhancing the value-added of agricultural products to boost their competitiveness in the international market [20].

Overall, existing studies indicate that China-Vietnam agricultural trade exhibits strong complementarity but also faces certain challenges. The literature review provides robust theoretical support for understanding the cooperative potential of the two countries in the agricultural sector and points out that the optimization of the policy environment and the diversification of trade structures will be key to the further development of China-Vietnam agricultural cooperation in the future.

3 THEORETICAL ANALYSIS

The complementarity of China-Vietnam agricultural trade can be analyzed from multiple theoretical frameworks, including the theories of comparative advantage, complementarity, and intra-industry trade.

Firstly, the theory of comparative advantage provides the foundation for explaining China-Vietnam agricultural trade. According to this theory, countries should focus on producing and exporting products in which they have a comparative advantage, thereby enhancing economic benefits through international trade. Vietnam holds significant comparative advantages in certain agricultural product sectors, such as rice, coffee, and rubber. As one of the world's major rice producers, Vietnam's rice not only meets domestic demand but is also heavily exported to the Chinese market, filling the food demand in some regions of China. At the same time, Vietnam's coffee industry occupies a position in the global market, becoming one of Vietnam's important export commodities. These products have provided Vietnam with strong export competitiveness, especially in the highly demanding Chinese market. Moreover, Vietnam's tropical fruits (such as durian and bananas), due to their high quality and market demand, have quickly captured a portion of the Chinese market share. Meanwhile, China has significant advantages in exporting agricultural machinery, fertilizers, and other agricultural production materials, supporting Vietnam's agricultural modernization. This trade relationship, based on comparative advantage, helps both China and Vietnam maximize benefits in their respective advantageous sectors. In modern agricultural production, innovation and application of agricultural machinery technology are also important drivers of agricultural development. By introducing precise agricultural equipment and technology, both China and Vietnam can further enhance agricultural production efficiency and reduce labor costs, thereby promoting stable growth in trade [21].

Secondly, the theory of complementarity further explains why China-Vietnam agricultural trade can continue to grow. The theory of complementarity emphasizes that two countries have a complementary relationship in the production and demand of different product sectors, which drives the growth of bilateral trade. In China-Vietnam agricultural trade, Vietnam's agricultural products can effectively compensate for shortages in certain seasons or specific agricultural products in the Chinese market. For example, China's demand for tropical fruits and rice is increasing, and Vietnam is one of the main suppliers of these products. Vietnam's tropical fruits, such as durian, mangoes, and bananas, are gradually entering the Chinese market, meeting the needs of Chinese consumers. Meanwhile, China's exports of agricultural machinery and modern production tools provide Vietnam with essential material support, further enhancing Vietnam's agricultural production capacity. The complementarity in agricultural products between the two countries not only increases trade volume but also enhances the potential for bilateral agricultural cooperation.

Thirdly, the theory of intra-industry trade reveals another important characteristic of China-Vietnam agricultural trade, which is that bilateral trade is not limited to traditional inter-industry trade but also includes substantial intra-industry trade. Intra-industry trade refers to the two-way trade of the same category of products between two countries. For example, in the fruit sector, China and Vietnam exhibit intra-industry trade phenomena. Vietnam exports tropical fruits such as durian, longan, and passion fruits to China, while China exports northern fruits and some processed agricultural products to Vietnam [12]. This intra-industry trade helps to enhance the efficiency of cooperation between the two countries and avoids the risks of market fluctuations associated with single-industry trade.

Additionally, from the perspective of policy and international economic agreements, since the implementation of the China-ASEAN Free Trade Area (CAFTA) in 2010 and the Regional Comprehensive Economic Partnership (RCEP) in 2020, the agricultural trade policy environment between China and Vietnam has significantly improved. Through these free trade agreements, tariff barriers on agricultural products between the two countries have been substantially reduced, especially in high-demand agricultural sectors such as aquatic products and tropical fruits. The removal of tariffs and elimination of trade obstacles have accelerated the circulation of agricultural products. Meanwhile, Guangxi, as a frontier region for China-Vietnam agricultural trade, has upgraded infrastructure and improved customs clearance efficiency, enabling agricultural products, especially perishable items like aquatic products and fruits, to enter the market more quickly and efficiently. These policy factors have greatly promoted agricultural trade between China and Vietnam and laid the foundation for future cooperation.

In summary, the complementarity of China-Vietnam agricultural trade relies not only on the comparative advantages of the two countries in different product sectors but also benefits from the development of intra-industry trade and the support of international trade policies. Through the analysis of the aforementioned theories, it is evident that China-Vietnam agricultural trade holds great potential. The two countries should continue to deepen cooperation, enhance the quality and efficiency of trade, thereby further promoting the development of bilateral economies.

4 CONCLUSION

Through the analysis of agricultural trade between China and Vietnam, the following conclusions can be drawn: the two countries exhibit significant complementarity in the agricultural sector, and this complementarity plays an important role in bilateral trade. As a major agricultural producer in Southeast Asia, Vietnam possesses abundant tropical agricultural resources, such as rice, coffee, and rubber, which closely match the demands of the Chinese market. Meanwhile, China, as a major provider of agricultural production materials and technology, offers essential support for the modernization and yield improvement of Vietnam's agriculture. The two countries form complementarity in agricultural products where each holds a comparative advantage, thereby driving the sustained growth of bilateral trade. In addition to complementarity in types of agricultural products, China and Vietnam also demonstrate strong cooperative potential in intra-industry agricultural trade. The two countries engage not only in simple product exchanges but also in bidirectional product flows, progressively achieving collaborative optimization of the agricultural supply chain. For example, Vietnam's tropical fruits are gradually becoming an important component of the Chinese market, while China's agricultural product processing technologies add new impetus to Vietnam's agricultural production. This intra-industry trade helps improve agricultural production efficiency in both countries, enhance trade resilience, and reduce uncertainties caused by market fluctuations.

Policy factors are also key drivers of the growth in China-Vietnam agricultural trade. Since the implementation of the ASEAN Free Trade Area and the Regional Comprehensive Economic Partnership (RCEP), tariff barriers between the two countries have gradually decreased, and trade circulation has accelerated. The construction of infrastructure and improvements in customs clearance efficiency in border regions such as Guangxi have further facilitated the smooth flow of bilateral agricultural products. The optimization of the policy environment not only promotes an increase in trade volume but also provides a broader space for future agricultural cooperation.

However, despite the promising prospects of China-Vietnam agricultural trade, several challenges remain for the future. Firstly, there is some degree of competitive relationship in certain agricultural products between the two countries, such as competition for market shares in rice and certain fruits. Additionally, in terms of supply chain management and product quality standardization, coordination needs to be strengthened to ensure that the competitiveness of both countries' exported products in the international market is not compromised. To address these challenges, both countries need to further deepen cooperation, enhance the value-added of agricultural products, and continue to optimize the supply chain structure, thereby increasing the sustainability of trade.

In conclusion, the complementarity of China-Vietnam agricultural trade offers immense potential for bilateral economic cooperation. In future cooperation, both countries should fully utilize their respective comparative advantages, further deepen agricultural technology exchanges, and enhance trade standards, thereby achieving mutual development.

COMPETING INTERESTS

The authors have no relevant financial or non-financial interests to disclose.

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