INFORMATION ASYMMETRY IN CROSS-BORDER AGRICULTURAL PRODUCT E-COMMERCE: PERSPECTIVE OF POVERTY ALLEVIATION THROUGH E-COMMERCE IN CHINA

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Abstract

This study analyzes the performances, factors, and impact of information asymmetry being confronted by producers, platforms, and consumers engaged in cross-border agricultural product e-commerce based on the theoretical research and practical experience of Chinese poverty alleviation through e-commerce. It lays a theoretical foundation for adopting poverty reduction via cross-border agricultural product e-commerce in rural areas and provides feasible suggestions for less-developed regions. By conducting a literature review and interviewing, we discovered the reality, cause, and adverse outcome of asymmetric information dilemma in cross-border agricultural e-commerce. We argue that the risk of information asymmetry generated can weaken the interests of all involving stakeholders and affect the operational efficiency of market. Therefore, the corresponding solutions are proposed to consolidate the outcome of anti-poverty via e-commerce, improve the well-being of agricultural producers, and realize common prosperity.

Keywords: Information Asymmetry, Cross-Border E-Commerce, Agricultural Product, Poverty Alleviatio

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Introduction

The digital economy has emerged as a new driving force for the high-quality development of the global economy and has had a profound effect on the agricultural sector. According to data from the 2023 Global Multidimensional Poverty Index, 84 percent of the world's impoverished population is concentrated in rural areas, where they engage in single, scattered agricultural production and lack access to abundant information resources and marketing capabilities. They are the key target in poverty alleviation projects. In recent years, e-commerce has progressively penetrated rural regions in China, bringing about significant changes in agricultural production and the income levels of producers and serving as an important means for anti-poverty. In 2015, poverty alleviation through e-commerce was listed as one of the top ten targeted anti-poverty projects in China. Farm produce traded in e-commerce with unique rural region product attribute has brought huge economic benefits to anti-poverty in less-developed rural areas. According to the China

E-commerce Report, the rural online retail sales in 2022 was 3357.26 billion US dollars, with a year-on-year increase of 3.6 percent. The online retail sale of farm produce was 819.55 trillion US dollars, with 9.2 percent annual growth rate. The United Nations Development Programme (UNDP) has highly recognized that China's development-oriented poverty relief model has changed from mainly relying on external support to a more sustained effort from self-motivation. Cross-border agricultural products e-commerce has broken through the constraints of transaction time and space, organically integrating into the global agricultural value chain. According to data from the Ministry of Agriculture and Rural Affairs, the import-export volume of cross-border agricultural product e-commerce in China in 2020 was 6.34 billion US dollars, marking a 19.8 percent increase compared to 2019.

In the theoretical research phase, the cross-border agricultural product e-commerce is the new outcome of digital economy, and it is still in the initial and developed phase. In practice, the stakeholders face the risk of asymmetric information in varying degrees due to different information acquisition abilities, which restricts the interests of all entities involved and limits marketing efficiency. Therefore, it is crucial to comprehensively understand the internal mechanism of information asymmetry and devise measures to address the issue of rural poverty reduction.

Literature Review

Extensive literature research conducted both domestically and internationally has yielded fruitful results in the study of the economic impacts of e-commerce. Recent years have witnessed a surge in research interest pertaining to poverty alleviation through e-commerce, poverty relief through information, and exploring its applications in the gaming area. Additionally, there has been a growing emphasis on understanding how

information asymmetry in microeconomics influences e-commerce. Consequently, this study aims to systematically review relevant literature published in these years at Table 1.

Researchers have proposed the viability of extensively expanding agricultural commerce in rural areas as a means to alleviate poverty. In an empirical study, Li and Zhao conclude that the informationization and income level of residents are the tangible outcomes of poverty alleviation through e-commerce. China's Internet penetration reached 73 percent in 2022, representing a 25 percent increase compared to the figure recorded in 2014. The overall development level of county-level digital agriculture and rural is 36 percent, up 3 percent from the previous year. Moreover, according to data released by China's National Bureau of Statistics, agricultural producers' disposable income has risen by 4.2 percent to reach 2758 US dollars. Notably, e-commerce is emerging as a pivotal catalyst for economic growth and an essential tool for combating poverty. However, there is a significant research gap in understanding the information asymmetry among key stakeholders in the context of poverty alleviation through e-commerce. Specifically, there is a lack of studies that examine the impact of information asymmetry on CBEC, strategies to mitigate market disorder caused by information asymmetry in CBEC, and approaches to empower agricultural producers in reducing poverty intensity. These areas represent crucial research priorities in the current academic landscape. This study investigates the mechanism of information asymmetry in the context of e-commerce-driven poverty alleviation. It concentrates primarily on the difficulties of information asymmetry among agricultural producers and proposes measures to lift them out of poverty.

Table 1 Poverty Alleviation through E-Commerce-Related Literature Point of View

Research Subject	Author/Year	Point of View
Poverty alleviation through e-commerce	Wang (2011)	The Internet can transcend the geographical boundaries between rural and urban areas. Promoting e-commerce in rural regions can help alleviate the long-standing informational disadvantages faced by the agricultural producers community.
	Shi (2021)	Rural e-commerce facilitates the bi-directional flow of resources between rural and urban areas. However, the presence of insufficient information in interest-driven transactions poses a threat to the interests of certain stakeholders. In the long run, this can lead to a loss of motivation among rural e-commerce participants.

Table 1 Poverty Alleviation through E-Commerce-Related Literature Point of View (Con.)

Research Subject	Author/Year	Point of View
Poverty alleviation through e-commerce	Zhang (2022)	The rapid expansion of Cross-Border E-Commerce (CBEC) plays a crucial role in achieving common prosperity. However, the pace of CBEC development has outstripped the progress made in oversight measures, resulting in a digital divide that hampers the realization of common prosperity.
	Qiu and Zhou (2021)	The Internet and e-commerce improve the information environment, particularly for low-income rural populations, thereby reducing the economic disparity between rural and urban areas.
	Yan et al. (2018)	Underprivileged regions expand the practical implementation of e-commerce by aligning it with their specific circumstances. Government policies play a crucial role in stimulating the motivation of individuals and industries to participate in e-commerce, ultimately leading to poverty reduction.
	Gong (2016)	The market mechanism aligns more closely with anti-poverty efforts, and the combination of market-oriented and government-dominated approaches can expand the scope of poverty reduction measures.
	Zhang et al. (2021)	Rural e-commerce boosts personal income, boosting rural income and development.
	Carmen et al. (2016)	E-commerce encourages social innovation, which helps peasants sell products to customers at home and abroad, thereby reducing poverty.

Table 1 Poverty Alleviation through E-Commerce-Related Literature Point of View (Con.)

Research Subject	Author/Year	Point of View
Information asymmetry	Huang (2021)	The proliferation of new media has inundated us with vast amounts of information. Within this landscape, social media platforms significantly impact our ability to filter and identify Cross-Border E-Commerce (CBEC) trading entities, leading to the emergence of information asymmetry.
	Zhang (2017)	Information asymmetries in transaction, logistics, and payment hinder the transformation of potential online consumer demand into actual transactions and impede the progress of e-commerce development.
	Xu et al. (2014)	The exponential growth of data volume facilitates data mining and analysis, but simultaneously increases search costs, leading to minimal gains in legitimate information and heightened transaction risk due to information noise.
	Li and Wang (2021)	Compares search friction and information asymmetry. The former refers to businesses that use private information to increase profits. The latter depicts a circumstance where entities cannot get information.
	Xiong (2021)	Agricultural product live commerce leverages live streaming as a medium for information connection, effectively mitigating asymmetric information and bolstering trader confidence.
	Xu (2016)	Divergent target customer groups between CBEC and domestic e-commerce can give rise to a “lemon market” scenario, where the Mathew effect comes into play and eliminates inferior products from the market.
	Fan (2023)	Farmers face comprehension barriers regarding changes in the international market, often unable to access timely supply and demand information from overseas markets, making it challenging to assess market preferences.
	Ye and Gao (2023)	Information is one of the driving forces in cross-border supply chains, permeating all activities and operations within such chains. The diverse stakeholders and cultural and linguistic differences can lead to significant information asymmetry dilemma.

Table 1 Poverty Alleviation through E-Commerce-Related Literature Point of View (Con.)

Research Subject	Author/Year	Point of View
Poverty-alleviation through information	Si (2019)	The poverty-stricken regions face a deficiency in digital access and limited abilities for information reception and utilization. Conducting poverty alleviation through digital technology would improve the poor's right to information technology dividends.
Game among e-commerce stakeholders	Lu and Li (2019)	The steady growth of e-commerce relies on the integrity exhibited by both merchants and consumers.
	Hu and Peng (2021)	E-commerce platforms' decision to participate is influenced by whether the additional revenue outweighs the associated costs, and governments may provide incentives accordingly. Insufficient subsidies might discourage agricultural producers from utilizing e-commerce platforms for sales.

Strategy of Poverty Alleviation through E-Commerce in the Rural Region

1. Connotation of Poverty Alleviation through E-Commerce

From the traditional view of the vicious circle of poverty, regional poverty results from low income and savings. Whereas the new theory today emphasizes low productivity due to a deteriorating environment as the source of poverty. How to solve fundamental regional poverty through society is the main content to discuss.

The anti-poverty experiences in emerging nations reveal that enhancing knowledge is the top priority in poverty alleviation. Only with a shift of mentality and awareness would it be possible to help the agricultural producers out of poverty. Thus, developing their consciousness and inspiring self-development ability, while also assisting them in enjoying the digital interests generated by information technology by eliminating information asymmetry through internet technology is one way to help them emerge from impoverishment.

However, the majority of developing countries have weak infrastructure and imbalanced regional growth, leading to a large digital divide between rural and urban regions. Rural areas with high poverty cannot achieve sustainable development by implementing traditional anti-poverty strategies, which rely largely on external assistance (Zhang, 2018). It is a lack of endogenous power of the poverty group's self-development, which is more focused on short-term outcomes and incapable of achieving long-term sustainable growth. E-commerce is the result of the

digital economy, which removes temporal and spatial constraints of trading entities, increasing transaction efficiency, and to some extent, reducing costs. This has brought a new idea to current anti-poverty projects.

In conclusion, anti-poverty through e-commerce is generalized as the key means of internal support, which refers to eliminating poverty through e-commerce, improving the e-commerce environment, promoting the development of e-commerce and industries in less-developed region, driving internet business and consumption, enhancing the self-development ability of poor communities, and ultimately increasing income directly or indirectly (Yan et al., 2018).

2. Mechanism of Poverty Alleviation through E-Commerce in the Rural Region

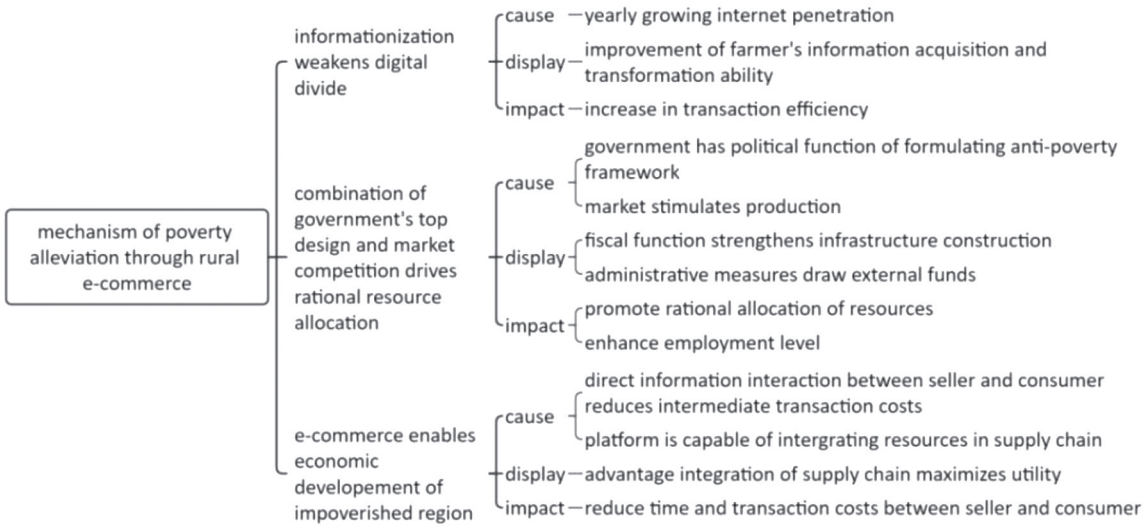

Figure 1 Mechanism of poverty alleviation through rural e-commerce

2.1 Information Weakens the Digital Divide

Social members receive information in a variety of ways. Urban areas, with advanced infrastructure and stronger economic growth, have a higher capacity to access information compared to less-developed rural areas. The ability to capture and transform information is currently increasingly significant in the era of digital economy prominent at the moment, with the Internet and traditional economy in-depth, that is, how to obtain valid information and data and penetrate its value into the industry is the optimal path to relief impoverishment. Internet penetration in less-development region is steadily increasing, making it the primary source of information and enhancing social members' capacity to capture data. It is attached and transferable in the sight of the feature of information. On one hand, the construction of digital infrastructure theoretically improves the flow of information. This shift moves beyond relying on word-of-mouth in acquaintance society and reduces search costs through internet search engines. Timing is a vital component in agricultural

product transactions, and significantly impacts trade profitability. On the other hand, rural areas, given constant information volume, struggle to access an equal amount of information and make optimal decisions within a specific timeframe. This intensifies the information asymmetry among entities involved in agricultural product trading. Consequently, sellers face higher information search costs, making them less willing to engage in e-commerce transactions.

2.2 E-Commerce Enables Economic Growth of Less-developed Region

E-commerce is a new economic model that integrates traditional trade with the Internet, using e-commerce platforms and the support of Internet to reduce transaction costs for both buyers and sellers, with the platform serving as the vehicle and transactions taking place through first-hand online information exchanges between trading entities. The primary trading entities that generate agricultural items in less-developed regions are roughly divided into agricultural producers, e-commerce platforms, and consumers. Farm produce, characterized by seasonal availability, low prices, and perishable nature, are typically purchased in bulk by consumers. However, agricultural producers generally lack knowledge about supply and demand dynamics and consumer preferences, and they face challenges in accessing timely information. Consequently, the price of farm produce is typically determined by consumers. E-commerce platforms play a crucial role in supporting the seamless operation of all entities within the supply chain, mitigating barriers, and promoting integration (Liu, 2002). By integrating resources, these platforms directly reduce trading costs associated with intermediaries and offline processes, while also saving time. Currently, the Chinese government has implemented rural e-commerce demonstration projects as part of their poverty alleviation efforts, yielding significant economic improvements in less-developed regions. For example, in Sichuan province, the retail volume of agricultural products increased from 645 million US dollars in 2015 to 4.4 billion US dollars in 2020, with an average growth rate exceeding 50 percent. The emergence of TaoBao Village in China, an e-commerce cluster, serves as a successful case study on how e-commerce drives rural digital economy. According to AliResearch statistics, the annual transaction volume of Taobao village and county exceeded 1.45 US dollars in 2020, creating over 8.28 billion job opportunities (AliResearch, 2021).

Despite the challenges posed by the COVID-19 outbreak, e-commerce has demonstrated resilience and continued growth, showcasing its pivotal role in poverty reduction. It has become a notable example in navigating volatile markets and addressing poverty-related challenges. Therefore, e-commerce plays an unprecedented and vital role in anti-poverty initiatives.

2.3 Combination of Government's Top-Design and Market Competition Drives the Rational Allocation of Resources

Poverty alleviation through e-commerce is a top-down approach, where the government takes charge of designing and implementing anti-poverty strategies, while market mechanisms play a dominant role. In China, the governments play a crucial political function in formulating comprehensive anti-poverty plans that address widespread and intensified impoverishment. In contrast, the market possesses significant competence and efficiency advantages over the government (Gong, 2016). It operates through a decentralized decision-making process and free-market exchanges, which encourage agricultural producers to explore new production components, stimulate customer demand, and create new tradable goods, thus enhancing overall economic efficiency (Zhang, 2018).

However, it is important to note that the market is not a panacea. Market failures are inevitable, characterized by information asymmetry and rational decision-making errors. Moreover, the market's survival of the fittest principle exacerbates resource outflows from deprived regions to more developed areas. Therefore, relying solely on the invisible hand of market to allocate resources efficiently is impractical. In other words, using a complete market system to reduce poverty is irrational. This highlights the essential role of the government in creating a sound and orderly environment. The government can improve digital infrastructure in impoverished areas through fiscal measures, promote poverty alleviation across regions and stakeholders, and attract external funds from urban to rural areas through administrative measures to facilitate rational resource allocation and expand employment opportunities.

However, The market is not everything. In some cases, there may be a significant waste of resources due to a lack of expertise and corruption. For example, during the early period of China's reform and opening-up, there were instances of inefficient resource allocation and corruption in poverty alleviation efforts initiated by the government. These initiatives failed to bring about sustainable self-development among the aid recipients. Therefore, a scientific approach to poverty alleviation requires a deeper integration of market competition and administrative procedures.

Overall, an effective anti-poverty strategy should combine the strengths of both the market and the government, while addressing their respective limitations. By doing so, it is possible to achieve sustainable poverty reduction through a well-balanced approach that leverages market forces and efficient governance.

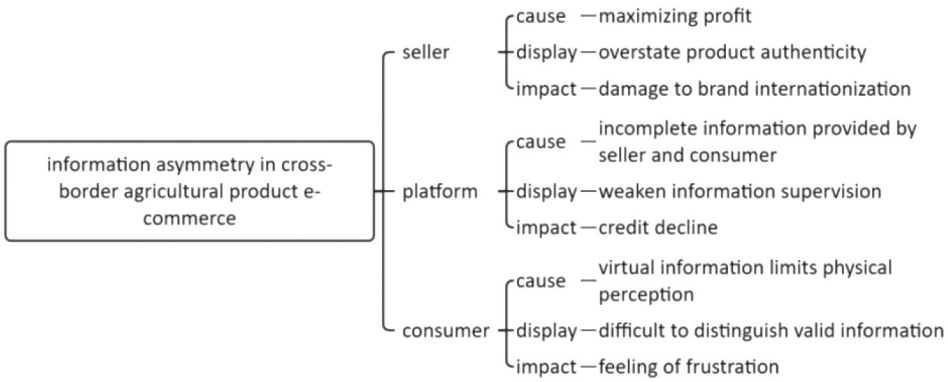

Figure 2 Information asymmetry in cross-border agricultural product e-commerce

Analysis of Information Asymmetry of Cross-Border Agricultural Products E-Commerce

According to the theory of asymmetric information, when the stakeholders involved in a transaction have unequal access to information, the one with more information have an advantage, while the one with less information is at a disadvantage. In various sectors of microeconomics, it has been demonstrated that information asymmetry leads to increased instances of moral hazard and adverse selection, resulting in a decline in market efficiency.

An example of adverse selection can be seen in George A. Akerlof's Lemon Theory. It asserts that in a market for used cars, sellers hide information about the true condition of the vehicles from consumers, preventing them from making informed decisions. As a consequence, lower-quality cars may be sold for more than their actual value, while higher-quality cars are driven out of the market. This phenomenon is commonly referred to as bad money driving out good money.

Moral hazard occurs when customers experience financial losses due to exaggerated or deceptive product information that they lack comprehensive knowledge about. For instance, if consumers do not possess complete information about a product, they may suffer losses as a result of overstated or misleading information. In the securities market, the borrower holds an advantageous position of information superiority as they are aware of their own trustworthiness and intended use of the borrowed money. They harm the lender's interests by breaching the loan agreement, diverting the funds for unintended purposes, and providing false information about investment returns to avoid repayment. This behavior exemplifies moral hazard.

Overall, these examples highlight how information asymmetry can lead to both adverse selection and moral hazard, negatively impacting market efficiency and distorting economic outcomes (Wu, 1997).

This study provides a demonstration of moral hazard through seller dishonesty

and adverse selection through the purchase decisions of cross-border consumers who possess dissimilar amounts of information. The success of CBEC is contingent upon a significant amount of information being transmitted over the internet. Unfortunately, the high-speed flow of virtual information has rendered physical reference infeasible, and verifying the veracity of fraudulent information on the internet can be costly. Consequently, asymmetric information contributes to an increased risk associated with cross-border agricultural products e-commerce.

1. Information Asymmetry of Cross-Border Agricultural Products E-Commerce in Agricultural Producers

Different regions produce farm produce with varying quality standards, leading to the trading of both high-grade and poor-grade produce on CBEC platforms. Some merchants employ marketing strategies that involve exaggerating the content of their goods and inflating the accuracy of information provided. The field of evolutionary game theory suggests that participants in CBEC trades exhibit limited rationality. Producers engage in strategic behavior to maximize their benefits by exploiting information at minimal cost and inflating the authenticity of product quality to increase revenues. Consequently, consumers lack sufficient information to make informed decisions. Typically, consumers tend to make judgments based on user consumption reviews. However, the authenticity of consumer feedback is compromised by click farming. Although the platform can greatly facilitate information interaction, asymmetric information gives rise to moral hazard, resulting in a certain loss for consumer interests. For instance, during the COVID-19 pandemic, numerous consumers purchased a large quantity of agricultural products out of sympathy for the plight of unsold agricultural producers. However, taking advantage of the consumers' compassion, they sold spoiled and rotten products. Such moral hazard risk can significantly undermine consumer trust in the platform and the seller.

Moreover, the credibility of certain producer has a significant impact, raising doubts about the goodwill of origin and hindering brand internationalization. For instance, issues of moral hazard involving a specific corporation and logistics stakeholders have affected the market for Golden Pillow Durian, a Thai product exported to China through CBEC, resulting in losses for multiple parties. In addition to marketing strategies, the perishable nature of agricultural products and transportation speed also affect product quality. Longer transit times are associated with decreased quality assurance. When agricultural products delivered to cross-border consumers spoil, the risk of returns and exchanges increases, leading consumers to doubt the quality of farm produce exported from original region, which in severe cases, affects the reputation of geographical indication agricultural products brand.

2. Information Asymmetry of Cross-Border Agricultural Products E-Commerce in Consumer

The main sources of information for consumers regarding CBEC products are the data provided by the platforms and the reputation of well-known brands. The platform is a critical conduit for product information that significantly influences consumer purchasing decisions. The use of virtual information on the internet impedes the consume's ability to perceive physical products. Driven by profit motives, sellers may conceal product weaknesses and enhance product goodwill by selecting or filtering reference images, placing the buyer at a disadvantage due to a lack of accurate information (Zhang, 2017).

The information of agricultural product published by platforms is often incomplete. Given the seasonal nature of agricultural products, there are variations in quality and appearance between batches. Additionally, consumers and platforms themselves may have cognitive biases regarding such information. However, according to the information disclosure theory, the more complete, authentic, and transparent the information provided regarding agricultural products, the lower the impact of information asymmetry risk on consumers, thereby increasing the credibility of the platform and sellers. In contrast, the consumers are exposed to moral hazard from other stakeholders, resulting in varying levels of interest loss. Akerlof's lemon market hypothesis suggests that if a seller offers low-quality goods at a high-quality price, a buyer with inferior information asymmetry will find it challenging to detect the genuine product, leading to the withdrawal of high-quality goods from the market. In addition to causing emotional harm to consumers, an unstable economy in which bad money pushes out good money undermines efforts to alleviate poverty through CBEC transactions of agricultural goods.

3. Information Asymmetry of Cross-Border Agricultural Products E-Commerce in Platforms

The main cause of information asymmetry in cross-border agricultural product e-commerce platforms is the presence of incomplete or inaccurate information provided by both agricultural producers and consumers. As an intermediary in a two-sided market, the platform acts as a bridge between buyers and sellers. If either party provides incorrect information, it can negatively impact the entire trade chain. The platform's diminishing role in supervising information further exacerbates the moral hazard faced by both agricultural producers and consumers. Specifically, the moral hazard is manifested when producers inflate or misrepresent information. If this information bias is not addressed, consumers may make purchases based on information that significantly deviates from the actual product, leading to harm for both consumers and damage to the long-term reputation of the platform.

On the other hand, the platform itself possesses a wealth of information about consumers and producers. Currently, through data mining techniques, the platform can accurately capture consumer preferences

and enhance the user experience of CBEC transactions. However, this also gives rise to concerns such as privacy breaches and the negative effects of big data-enabled price discrimination, which decreases consumer satisfaction. In recent years, there has been a surge in incidents involving data interception and abuse, including the emergence of telecom fraud. Consequently, the platform's possession of data can further intensify information asymmetry between agricultural producers and consumers, potentially leading to biased product optimization aimed at maximizing transaction commissions, ultimately resulting in the loss of buyer interests.

Recommendation

1. Establish Cross-Border E-Commerce of Agricultural Products Information System

Develop an information-sharing platform for cross-border agricultural products e-commerce by integrating regional CBEC data, including product traceability, quality inspection, planting standards, supply and demand, and consumer evaluations. The platform aims to establish a reliable and transparent data source for CBEC stakeholders, addressing information disparities and ensuring the legitimacy and authenticity of the information provided. The platform enables sellers to conduct precise marketing analysis, allowing them to understand the demand for their products and gain insights into consumer evaluations and experiences within their target groups. By utilizing data analysis and artificial intelligence technologies, sellers can adjust their production or marketing strategies accordingly. This also encourages agricultural producers with poor quality and reputation to improve their overall capabilities. For consumers, the platform improves the efficiency of purchasing decisions. It analyzes the reputations of both the platform and sellers, allowing consumers to make informed choices when directly purchasing produce. This reduces adverse selection and the costs associated with searching for reliable information due to information asymmetry. Moreover, the platform effectively supervises seller product quality, eliminating sellers with a poor reputation and inferior products. As a result, positive word-of-mouth and export opportunities are enhanced.

2. Nurturing Agricultural Producers with Digital Skills

The government-led cross-border e-commerce training regarded as an important means to reduce the information asymmetry between producers and consumers. To change the development mindset of producers, it is essential to launch long-term professional skills training for the community, fostering a complex and application-oriented group with agricultural knowledge and cross-border e-commerce expertise. Firstly, a talent cultivation system should be established. Based of the gradual improvement of digital infrastructure in rural areas, we should enhance digital skills training for the farmer population, enabling them to master internet communication technology, possess data analysis and marketing capabilities. In cross-border e-commerce transactions of

agricultural products, they should actively obtain information related to cross-border e-commerce trade activities, breaking down information island and achieving efficient utilization of information resources.

Additionally, agricultural products vary in quality due to geographical differences. Internationally recognized brands, such as Thai dried longan and durian, New Zealand cherries, US milk, and Chinese crayfish, enjoy reputations for excellent product localization. Consumers, lacking comprehensive product information, often rely on well-known global brands to save time and make informed purchasing decisions.

Therefore, training project should enhance the awareness of the producers in regional brand development. In practical applications, this should be integrated into all aspects of agricultural product brand cultivation, leveraging the primary role of the farmer community (Guo, 2019).

3. Optimize Platform's Service Content

The CBEC platform serves as a vital link between consumers and agricultural producers, with the agricultural producers' interests being positively correlated to the platform's success. To improve the seller's reputation, customer loyalty, and satisfaction, maximizing the service content provided by the platform is crucial. Firstly, based on the aforementioned analysis, cross-border agricultural consumers are highly concerned about the timeliness and traceability of logistics. Therefore, platforms should select high-quality cold chain logistics partners, ensure real-time data sharing between the platform and logistics companies, to meet consumer demands for tracking logistics information. Furthermore, the platform enhances the consumption experience by expanding service functions, thereby increasing the conversion rate of agricultural product transactions. Under the live streaming model, the host acts as a medium for information dissemination between producers and consumers. Through real-time interactions, they can provide a multi-faceted display of agricultural product information. Sellers can directionally convey richer information to consumers (Xiong, 2021), not only showcasing the physical attributes of the product but also conveying the story and culture behind it, stimulating consumer desires to make a purchase and shortening the decision-making process. This direct information transmission model can reduce the information search costs for both buyers and sellers, leveraging matching algorithms to achieve efficient data integration, essentially addressing the supply-demand relationship.

Conclusion

This study proposes that promoting development-oriented anti-poverty model, namely cross-border agricultural product e-commerce, can aid in lifting farm producers in less-developed rural areas out of poverty. However, through theoretical analyses and interviewing, we found that information asymmetry can damage the interests of all involved parties, sellers (producers), intermediary platforms, and

buyers (consumers). This, in turn, limits the operational efficiency of the cross-border e-commerce market for agricultural products. Consequently, we propose a series of measures to mitigate the risks associated with information asymmetry, including the establishment of an information-sharing platform led by the government to facilitate efficient information transfer. Implementing digital skills training programs to enhance the cross-border e-commerce knowledge and marketing skills of farm producers. Platform optimization services to reduce information searching costs. Furthermore, it is worth discussing that even if the adverse effects of information asymmetry are mitigated, there still exists the risk of information security. Stakeholders face information misuse based on wide disclosure and transparency. Therefore, solving the adverse impact of information asymmetry in cross-border agricultural products e-commerce while taking information security into account would be further research.

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