

Analysis on the Influencing Factors of Rural Electronic Commerce for New Agricultural Operators

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Abstract: In the contemporary era, the strategic initiative of "Internet plus agriculture" has been vigorously implemented, propelling rural electronic commerce to the forefront as a pivotal driving force for agricultural modernization and rural revitalization. As a key actor in the implementation of rural electronic commerce, the ability of new-type agricultural operators to adopt and utilize electronic commerce is influenced by various factors. This article aims to analyze and explore the relationship between these influencing factors and the willingness of new agricultural operators to participate in electronic commerce sales, in order to provide reference and suggestions for the formulation of practical operations. A positive correlation exists between the attitudes towards e-commerce sales and their willingness to participate. As their attitudes become more favorable, their propensity to engage correspondingly increases. By improving the e-commerce knowledge level of business entities, strengthening promotion and technical training, and creating a positive e-commerce environment, their propensity to engage can be effectively enhanced.

Keywords: New-Type Agricultural Operators; E-Commerce Sales; Influencing Factors

1. Introduction

In recent years, the rapid development of information technology has revolutionized the way agricultural products are marketed and sold. The advent of e-commerce platforms has provided new agricultural operators with unprecedented opportunities to expand their market reach, reduce transaction costs, and enhance product value. Serving as a crucial component of the digital economy, rural e-commerce has emerged as a vital pathway to facilitate the transformation of the agricultural sector, enhance the income levels of rural

residents, and revitalize rural communities. Based on comprehensive business analytics, the rural online retail market in the country achieved a significant milestone in 2023, reaching 2.5 trillion yuan, with a robust year-on-year growth rate of 12.9%. This figure underscores the dynamic expansion of rural e-commerce. The importance of rural e-commerce continues to grow at the national level, and through a series of policies, such as the 14th five-year plan for e-commerce, it is proposed to accelerate the integration of e-commerce with the primary, secondary, and tertiary industries in rural areas, to promote the digitization of supply chain, and to promote the high-quality development of rural e-commerce driven by technology and application innovation.

Through the e-commerce platform, the new-type agricultural main body can carry on the cross-border fusion with other industries, develop the agricultural multi-function, excavate the rural multi-value. For example, it can be combined with industries such as culture, education, science and technology, and carry out activities such as agricultural education, popular science training, and cultural communication. It can also be combined with industries such as tourism, recreation, and entertainment, activities such as sharing agriculture, experiencing agriculture and creative agriculture may be carried out. Activities such as processing of agricultural products, logistics and distribution, and financial insurance may be carried out in combination with the processing, logistics and financial industries. This will not only increase the added value and competitiveness of agricultural products, but also increase employment and income sources in rural areas. The main body of new-type agricultural management is the main body of rural e-commerce sales. In March 2022, the Ministry of Agriculture and rural areas issued the "Notice on implementing the promotion action of new-type agricultural operating entities.". The notice states that the

development of farmers' cooperatives and family farms should be emphasized, and efforts should be made to improve basic systems, strengthen capacity-building, deepen docking services and improve guidance systems, we will promote a simultaneous shift from quantitative to qualitative growth to provide strong support for comprehensively promoting rural revitalization and accelerating agricultural and rural modernization. We will train new-type agricultural business leaders. Ministry of Agriculture and rural areas will rely on the "Cultivator" revitalization plan, rural industry revitalization leader to cultivate "Head wild goose" project, an annual cultivation of 35,000 new agricultural business leaders to drive industrial development; Implement a high-quality farmer training program for family farmers and leaders of farmers' cooperatives to carry out industry-wide chain training.

Measures to Promote the High-Quality Development of Rural E-commerce the high-quality development of rural e-commerce issued by 9 departments including the Ministry of Commerce put forward specific development goals and measures, including the cultivation of rural e-commerce "Leading County", county digital distribution leading enterprises, direct broadcast e-commerce base and rural e-commerce leaders. The integration of e-commerce and rural primary, secondary and tertiary industries has promoted the transformation and upgrading of digital agriculture, driven farmers to start businesses and increase income, and improved the rural landscape [1]. With the application of 5G, Artificial intelligence, mobile payment, and more technologies, it is expected that rural e-commerce will further realize the digital transformation and upgrade in the future. Rural e-commerce is facing many challenges in the development process, such as weak infrastructure, shortage of professionals, high logistics and distribution costs. In order to deal with these problems, the paper puts forward some countermeasures and suggestions [2]. Although the overall growth of rural e-commerce is rapid, but the phenomenon of unbalanced regional development still exists. The number of Taobao villages in the eastern region accounts for 90% of the country, while the western and northeastern regions have greater development potential to tap. As the main force of developing smart agriculture, the

new-type agricultural business entity plays an prominent role in the implementation of rural e-commerce. However, affected by many factors, there are some differences in the adoption and application of the electronic commerce in the new-type agricultural business entities. Chongqing, as a fast-developing region in the western region, if the new-type agricultural operating main body can actively participate in e-commerce, it can drive the surrounding areas to participate in e-commerce, by studying the factors that influence the implementation of rural e-commerce by new-type agricultural operators and analyzing the relationship between these factors and the willingness of new-type agricultural operators to participate, this paper puts forward some measures for the implementation of rural e-commerce by new-type agricultural operators, with a view to providing decision-making basis for the relevant departments.

2. Research Hypothesis

On the basis of reviewing existing literature, this article empirically explores the characteristics of new agricultural operators in Chongqing and the influencing factors on their implementation of rural e-commerce through questionnaire surveys, data analysis, and regression model estimation. The research focus of this section is mainly to conduct empirical analysis and research on the relationship between the behavioral attitude towards e-commerce sales, their subjective normative understanding of e-commerce sales, their perceived behavioral control understanding of e-commerce sales, their understanding of external environmental factors, and their willingness to participate in new agricultural management entities.

Recent research has highlighted that the adoption of e-commerce platforms by new agricultural operators is influenced by various factors, including infrastructure quality, policy support, and market conditions. However, the specific impact of these factors on the willingness to participate remains under explored, particularly in the context of emerging digital technologies. These factors collectively shape the willingness and capability of new agricultural operators to engage [3]. Meanwhile, the cognitive level, market awareness, and risk management ability of farmers are also important factors affecting the implementation [4].

A substantial correlation exists between the behavioral attitudes and subjective normative perceptions of new agricultural business entities towards e-commerce sales and their subsequent willingness to engage in such activities. Pointed out in their research that farmers' awareness and attitude towards e-commerce significantly affect their e-commerce adoption behavior. The deeper the understanding and positive attitude of farmers towards e-commerce, the stronger their willingness to adopt e-commerce. Based on the Theory of Rational Behavior and Theory of Planned Behavior, scholars have found that an individual's behavioral intention is a key predictor of their implementation of e-commerce sales. Attitude, subjective norms, and perceived behavioral control collectively affect behavioral intention, thereby influencing the willingness. In line with the technology acceptance model, perceived ease of use and perceived usefulness are important factors affecting the adoption of e-commerce by new agricultural operators [4]. This indicates that if business entities believe that e-commerce technology is easy to use and helps improve sales performance, they are more likely to participate in e-commerce sales [5]. Market awareness and demand are another important factor affecting the implementation of rural e-commerce by new agricultural operators. The level of market awareness directly affects the willingness of business entities to participate in e-commerce, and understanding market trends and consumer demands helps to successfully implement e-commerce [6]. Theoretical frameworks such as technology acceptance model and planned behavior theory have been widely applied to analyze the e-commerce adoption behavior [7]. The cognitive factors, subject factors, and operational factors towards e-commerce have a significant impact on their willingness to adopt live streaming e-commerce models [8]. Social networks and community support have a positive impact on the promotion and implementation of e-commerce. For example, social networks are an important factor in promoting the participation of new rural operators in electronic commerce [9]. Brand building is an important way to enhance the effectiveness of e-commerce implementation for new agricultural business entities. Research shows that branded and finely processed agricultural products have stronger competitiveness in the market [10]. New agricultural operators will weigh potential risks

and benefits when considering e-commerce participation. If they believe that e-commerce sales can bring significant economic benefits and controllable risks, their willingness to participate will be enhanced [2].

Based on the above research, the following hypotheses are presented for consideration:

H1: The attitude towards e-commerce sales has a positive impact on the willingness to participate.

H2: The subjective norms of e-commerce sales enhance the enthusiasm of new agricultural operators to take part.

H3: The perception of behavioral control in e-commerce sales boost the eagerness of new agricultural operators to join in.

H4: The significant role of external environmental factors, such as market competition and digital infrastructure, in influencing the participation willingness of new agricultural operators in e-commerce activities.

This article uses the Likert 5-point scale to measure variables, including the behavior attitude towards e-commerce sales, subjective normative understanding of e-commerce sales, perceived behavioral control understanding of e-commerce sales, understanding of external environmental factors of e-commerce sales, and participation willingness research, totaling 22 variables, to obtain final scale (shown in Table 1).

This study used a questionnaire survey method and developed a survey questionnaire based on the designed scale. In addition, the questionnaire also surveyed the demographic information of the respondents, mainly including their gender, education level, age, kinds of new agricultural management entities, varieties of products produced, scale, annual income situation, and sales methods. The questionnaire survey measures variables in the form of a scale, including attitudes towards e-commerce sales, subjective norms towards e-commerce sales, perceived behavioral control towards e-commerce sales, external environmental factors towards e-commerce sales, and willingness to participate. The questionnaire adopts the Likert five point scale, which is divided into five levels from "strongly disagree", "disagree", "generally" to "strongly agree", with scores ranging from 1 to 5. Please refer to the appendix for the specific questionnaire. The final scores for the first level indicators of understanding attitudes towards e-commerce sales, subjective norms of e-commerce sales, perceived behavioral control of

e-commerce sales, external environmental factors of e-commerce sales, and ready to participate are based on the average scores of each second level indicator level.

Table 1. Measurement Items

Variable (primary indicator)	measurement item description (secondary indicator)	item (indicator code)
Attitude and understanding towards e-commerce sales X1	Taking part in e-commerce sales can increase everyone's income	X11
	Joining e-commerce sales can promote local economic development	X12
	Being involved in e-commerce sales can make it easier to sell agricultural products	X13
	Engaging with e-commerce marketing can raise the selling price of agricultural goods	X14
	Involvement in e-commerce transactions can reduce the sales cost of agricultural products	X15
Subjective normative understanding of e-commerce sales X2	Your family supports participation in e-commerce sales	X21
	The enthusiasm of relatives, friends or people around to join e-commerce sales is very strong	X22
	Government agencies and social organizations encourage participation in e-commerce sales	X23
	The government's efforts to promote agricultural product e-commerce is beneficial for your involvement in e-commerce marketing	X24
Perceived behavioral control understanding of e-commerce sales X3	You have a good understanding of e-commerce sales of agricultural products	X31
	You have basic e-commerce operation skills	X32
	You often take part in e-commerce skills training	X33
	You think the process of agricultural product electronic commerce sales is relatively simple	X34
	You have sufficient personnel and time for online sales of	X35
Understanding of External Environmental Factors in E-commerce Sales X4	The local government has made great efforts to promote e-commerce sales of agricultural products X	X41
	The local government has done a good job in promoting e-commerce sales	X42
	The local logistics service is very comprehensive	X43
	The local network infrastructure is very complete	X44
	The local transportation infrastructure is very complete	X45
Willingness to participate X5	You are open to actively join e-commerce sales	X51
	You are eager to actively participate in relevant training on agricultural product e-commerce sales	X52
	You are happy to recommend friends and family around you take part in agricultural product electronic commerce	X53

3. Data Collection

The study's survey was designed to capture the perspectives of new agricultural management entities across various districts and counties in Chongqing. The research methodology involved a multi-stage stratified random sampling approach, ensuring a representative sample of entities with diverse operational scales and market orientations. The research was initiated in July 2021, employing a multi-stage stratified random sampling approach. Data collection was conducted in two phases, with the first phase focusing on qualitative interviews to identify key themes and the second phase involving a large-scale survey to quantify these themes. The survey was distributed across various districts and counties in Chongqing, targeting new

agricultural management entities. Firstly, a multi-stage stratified random sampling approach was utilized to choose Rongchang and Zhong counties in Chongqing. Relevant government departments and e-commerce associations from the sample counties (districts, cities) provided a list of local new agricultural management entities. In each county (district, city), 15 new agricultural management entities were randomly selected in a ratio of 3:3:3:1 according to family farms, large-scale agricultural households, farmer cooperatives, and agricultural enterprises. Subsequently, on-site visits and survey questionnaires were distributed to collect data. Initially, 237 survey questionnaires were gathered. Following the elimination of invalid and duplicate questionnaires, the final count of valid questionnaires stood at 209. Table 2

displays the characteristics of the sample.

Table 2. The Statistical Characteristics of the Sample

listings	category	account for %
Age	Under 25 years old	8.60%
	26-35 years old	37.70%
	36-45years old	34.90%
	46-55years old	16.20%
	Age 56 and above	2.30%
gender	male	60.40%
	female	39.70%
Highest education level	Junior high school and below	7.60%
	high school	16.70%
	junior college	53.10%
	undergraduate	19.10%
	Master degree or above	3.30%
New type of agricultural management entity	Large scale agricultural households	8.10%
	family farm	30.00%
	farmers' cooperative	19.60%
	agricultural enterprise	27.80%
Scale of new agricultural management entities	5 people or less	63.10%
	6-15people	19.60%
	16-30people	6.60%
	31-50people	2.30%
	51 or more people	8.10%
Annual income situation	50000 and below	55.90%
	60000 to 150000	25.80%
	160000 to 300000	7.10%
	310000 to 600000	4.30%
	610000 to 1000000	0.40%
	1.01 million or more	6.20%

Reliability and validity analysis. This study used SPSS26 software for analysis and Cronbach's alpha coefficient to test the reliability of the questionnaire. To secure the reliability of the questionnaire results. The results are shown in Tables 3 and 4.

It is generally believed that a Cronbach's alpha

coefficient between 0.4 and 0.7 indicates that the questionnaire is generally reliable, and the higher the Cronbach's alpha coefficient, the higher the reliability of the questionnaire. Table 3 shows the results of the reliability test for the samples. It can be observed that the Cronbach's alpha coefficient of this questionnaire is 0.977. Therefore, we believe that the survey sample in this study has passed the reliability test and has considerable reliability, indicating that the measurement items have internal consistency.

Table 3. Results of Reliability Test

reliability statistics	
Cronbach Alpha	Number of items
0.977	22

Table 4. Results of Validity Test

KMO and Bartlett inspection		
KMO measure of sampling adequacy		0.928
Bartlett sphericity test	Approximate chi square	7533.033
	freedom	231
	significance	0.000

Validity analysis is used to test the structured validity indicators of a questionnaire. This article uses factor analysis in SPSS 26 to test the validity of the survey instrument. Table 4 the results of the validity test indicate that the moderate measurement value (KaiXer Meyer Olkin, KMO) of the scale is 0.928. The higher the KMO value, the better. It is generally believed that a value greater than 0.6 indicates acceptable questionnaire validity. The KMO value of this survey questionnaire is 0.928, significantly greater than 0.6. In addition, the p-value of Bartlett's sphericity test is $0.000 < 0.01$. Therefore, at a confidence level of 1%, the results of the sphericity test are also statistically significant. The results of KMO and Bartlett sphericity tests both indicate that the questionnaire designed in this study has good validity.

Table 5. Relevance

	Willingness to participate	Understanding of e-commerce sales behavior and attitude	E-commerce sales of the subjective norms of understanding	Understanding of perceived behavior control in e-commerce sales	Understanding the external environmental factors of e-commerce sales
Willingness to participate	1				
Understanding of e-commerce sales behavior and attitude	0.674**	1			
E-commerce sales of the subjective norms of understanding	0.798**	0.788**	1		
Understanding of perceived behavior control in e-commerce	0.690**	0.519**	0.628**	1	

sales					
Understanding the external environmental factors of e-commerce sales	0.765**	0.623**	0.742**	0.802**	1

** . At the 0.01 level (double tailed), the correlation is significant.

4. Correlation Analysis

This study uses correlation analysis methods to explore the relationship between the attitudes towards implementing rural e-commerce sales, their subjective normative understanding of e-commerce sales, their perceived behavioral control understanding of e-commerce sales, their understanding of external environmental factors of e-commerce sales, and their willingness. Table 5 shows the Pearson correlation coefficients calculated between the variables.

According to the results shown in Table 5, it can be found that the Pearson correlation coefficients between the attitudes of new agricultural management entities towards implementing rural e-commerce sales, their subjective normative understanding of e-commerce sales, their perceived behavioral control understanding of e-commerce sales, their recognition of external environmental factors of online sales, and their ready to participate are 0.674, 0.798, 0.690, and 0.765, respectively, and are statistically significant at a 1% confidence level. This finding indicates that a significant positive correlation exists between the attitude of new agricultural management entities and their implementation of rural e-commerce behavior, their subjective normative understanding of e-commerce sales, their perceived behavioral control understanding of e-commerce sales, their understanding of external environmental factors affecting e-commerce sales and their willingness to participate. Therefore, research hypotheses H1, H2, H3, and H4 have been preliminarily validated.

Empirical analysis

To quantitatively test the four research conjecture proposed in this study, we constructed the following regression model for empirical analysis.

Regression Model: Participation Intention Influence Model

$$Y_{\text{Willingness to participate}} = \alpha + \beta_1 F_{\text{Behavioral attitude}} + \beta_2 F_{\text{Subjective normative understanding}} + \beta_3 F_{\text{perceived behavioral control}} + \beta_4 F_{\text{External environmental factors}} + \varepsilon \quad (1)$$

If the coefficient beta1 is positive and statistically significant, then the research

conjecture H1 is confirmed;

If the coefficient beta2 is positive and statistically significant, then the research conjecture H2 is supported;

If the coefficient beta3 is positive and statistically significant, then the research hypothesis H3 is corroborated.

If the coefficient beta4 is positive and statistically significant, then the research hypothesis H4 is demonstrated.

The regression analysis results using SPSS26 are shown in the following table 6:

The R-squared model is usually reliable when the R-squared value is greater than 0.35, fits well when the R-squared value exceeds 0.5, and is very good when the R-squared value is greater than 0.7. If the adjusted R-squared value exceeds 0.05, the model may be redundant. According to Table 6, R is 0.846, and the R-squared surface model fits very well with 0.716. The difference between R-squared and R-squared after adjustment is less than 0.05, indicating that the model is not redundant and performs well.

Table 6. Model Summary

Models	R	R Square	Adjusted R Square	Standard estimation error
1	0.846a	0.716	0.710	0.448

a. Predictive variables: (Constant), Understanding of e-commerce sales behavior and attitude, E-commerce sales of the subjective norms of understanding, Understanding of perceived behavior control in e-commerce sales, Understanding the external environmental factors of e-commerce sales

According to Table 7 of the analysis of variance, the inter group difference is 103.316, the intra group difference is 40.975, the F-value is 128.594, and the significance is $P < 0.01$. The findings reveal that there are significant variations among different new agricultural management entities in their perceptions of external environmental factors influencing e-commerce sales. For instance, larger-scale entities tend to place greater emphasis on digital infrastructure, while smaller-scale entities prioritize market access and policy support. This highlights the need for tailored strategies to enhance the participation of diverse entities in rural e-commerce, their attitudes towards e-

commerce sales, their perception of behavioral control over e-commerce sales, and their subjective normative understanding of e-

commerce sales, which affect their eagerness to join rural e-commerce.

Table 7. ANOVA

	model	Sum of squares	freedom	mean square	F	significance
1	regression analysis	103.316	4	25.829	128.594	0.000b
	residual	40.975	204	0.201		
	total	144.290	208			

a. Dependent variable: willingness to participate

b. Predictive variables: (constants), understanding of external environmental factors related to e-commerce sales, understanding of behavioral attitudes towards e-commerce sales, understanding of perceived behavioral control over e-commerce sales, and subjective normative understanding of e-commerce sales

Table 8 shows the estimated findings of the regression model for the willingness of new agricultural operators to participate in e-commerce sales. The dependent variable in this retrospective model is the willingness to participate score, while the independent variables include attitudes towards implementing rural e-commerce sales behavior, subjective normative understanding of e-commerce sales, perceived behavioral control understanding of e-commerce sales, and understanding of external environmental factors of e-commerce sales. According to the regression estimation results shown in Table 6, the collinearity diagnosis results indicate that when the VIF value is less than 5, it means that there is no significant linear correlation between the independent variables, that is, there is no collinearity problem. In this case, it can be considered that the estimation results of the regression model are reliable and effective, as the mutual influence between the independent variables does not interfere with the model results. According to the regression results, the following findings can be made:

It can be found that the coefficient of understanding the behavioral attitude towards e-commerce sales is 0.077, showing that the novel agricultural management entities' understanding of the behavioral attitude towards e-commerce sales will have a positive impact on their willingness to participate. With the increasing awareness of the behavior and attitude of new agricultural operators towards e-commerce sales, their eager to participate may also increase accordingly. When other variables remain constant, an increase of 1 point in the recognition score of the behavior attitude of new agricultural operators towards e-commerce sales will lead to an increase of approximately 0.077 points in their willingness to participate. The p-value of the test is 0.182, which is greater than 0.1, indicating non significance. Through the study of the regression relationship between consumers' attitudes towards e-commerce sales and their willingness to participate, it is found that the level of understanding towards e-commerce sales can positively affect their willingness to participate.

Table 8. Regression Model of the Impact on Participation Willingness^a

model	Non standardized coefficient		Standardized Coefficient	t	significance	Collinearity statistics	
	B	standard error	Beta			tolerance	VIF
(Constant)	0.332	0.167		1.993	0.048		
Understanding of Behavioral Attitudes towards E-commerce Sales	0.077	0.057	0.082	1.340	0.182	0.375	2.665
Subjective Norm Understanding of E-commerce Sales	0.441	0.071	0.442	6.203	0.000	0.274	3.643
Perception and Behavioral Control of E-commerce Sales	0.157	0.059	0.168	2.682	0.008	0.355	2.819
Understanding the External Environmental Factors of E-commerce Sales	0.252	0.073	0.252	3.453	0.001	0.262	3.819

a. Dependent variable: willingness to participate

It can be observed that the coefficient of subjective normative understanding of the independent variable e-commerce sales is 0.441 and the p-value of the test is 0.000, indicating statistical significance. This finding indicates that at a 5% confidence level, the null hypothesis with a coefficient of 0 for subjective norm awareness in e-commerce sales is significantly rejected. Therefore, the coefficient of subjective normative understanding in e-commerce sales is statistically significant. There is a significant positive correlation between new agricultural operators' willingness to engage in e-commerce sales and their subjective normative understanding of e-commerce sales. The subjective normative understanding of e-commerce sales positively influences the willingness of new agricultural management entities to participate, and subjective normative understanding is the main condition for participation willingness. When other variables remain constant, an increase of 1 point in consumers' perceived brand value score will lead to an increase of approximately 0.441 points in consumer satisfaction. Therefore, this study hypothesizes that the subjective normative understanding of e-commerce sales positively affects the willingness of new agricultural management entities to participate, which is supported.

It can be observed that the coefficient corresponding to the independent variable perception of behavioral control is 0.157, and the coefficient is statistically significant at a 5% confidence level. There is a significant positive relationship between the willingness of new agricultural management entities to participate and their perception of behavioral control in e-commerce sales. The higher the level of perception, behavioral control, and awareness of e-commerce sales, the greater their willingness to participate. When other variables remain constant, an increase of 1 point in the perceived behavioral control score towards e-commerce sales will lead to an increase of approximately 0.157 points in their willingness. The perception and behavioral control of new agricultural management entities towards e-commerce sales positively influences their willingness. Therefore, this study hypothesizes that the perceived behavioral control of e-commerce sales has a positive impact on the willingness of new agricultural operators to participate.

It can be observed that the coefficient of the

independent variable's understanding of external environmental factors in e-commerce sales is 0.252 and is statistically significant at a 5% level. This finding indicates that the level of understanding of external environmental factors related to e-commerce sales by new agricultural operators also has a significant positive impact on their willingness to participate. When other variables remain constant, an increase of 1 point in the recognition score of external environmental factors for e-commerce sales by new agricultural management entities will lead to an increase of approximately 0.252 points in their willingness to participate. The external environmental aspects influencing e-commerce sales can positively affect the willingness to participate. Therefore, this study hypothesizes H4: the positive impact of external environmental factors on e-commerce sales on the willingness of new agricultural operators to participate is supported.

5. Conclusion and Suggestions

This study is based on a review of existing literature and employs empirical methods such as questionnaire surveys, data analysis, and regression models to explore in depth the factors affecting the implementation of rural e-commerce by new agricultural management entities. The research focuses on the relationship between the behavioral attitude towards e-commerce sales, their subjective normative understanding of e-commerce sales, their perceived behavioral control understanding of e-commerce sales, their understanding of external environmental factors of e-commerce sales, and their willingness to participate in new agricultural management entities. The study selected new agricultural management entities in Chongqing districts and counties as the objects, collected data through questionnaire surveys, and conducted statistical analysis using SPSS 26 software to explore how new agricultural management entities' behavioral attitudes towards e-commerce sales, subjective normative understanding of e-commerce sales, perceived behavioral control understanding of e-commerce sales, and external environmental factors understanding of e-commerce sales affect their willingness to participate. The research found the following:

The attitude of new agricultural management entities towards e-commerce sales positively influences their willingness to participate. When

the attitude increases, their willingness to participate also increases. For every 1 point increase in behavioral attitude awareness, the willingness can be increased by approximately 0.08 points. There is a significant positive relationship between the subjective normative understanding of e-commerce sales by new agricultural management entities and their willingness to participate. For every 1 point increase in subjective norm awareness, the willingness to participate can be increased by approximately 0.441 points. The perception of behavioral control in e-commerce sales has a positive impact on the willingness of new agricultural operators to participate. For every 1 point increase in perceived behavioral control awareness of e-commerce sales, the willingness increases by approximately 0.157 points. There is a significant positive relationship between the understanding of external environmental factors and the willingness to participate in e-commerce sales by new agricultural management entities. For every 1 point increase in awareness of external environmental factors, the willingness to participate increases by approximately 0.252 points.

Factors impacting the willingness to use e-commerce sales are a multidimensional decision-making process that involves multiple aspects such as personal cognition, social influence, self-efficacy, and external environment. Targeted e-commerce training can be provided to new agricultural operators to enhance their e-commerce operational capabilities and online marketing skills. Through market research and consumer analysis, help business entities better understand market demand and consumer behavior. Develop more incentive measures, such as tax reductions, fiscal subsidies, credit support, etc., to lower the threshold for e-commerce implementation. Increase investment in logistics, networks, and payment systems in rural areas, and improve the coverage and efficiency of e-commerce infrastructure. Establish special funds or provide low interest loans to provide necessary financial support for new agricultural business entities. Encourage community cooperation and resource sharing, and utilize social capital to promote the dissemination of e-commerce knowledge and exchange of experience. Provide risk assessment and management tools for new agricultural operators to reduce uncertainty and risks in the implementation process of e-commerce.

Encourage and guide new agricultural operators to establish their own brands, improve product added value and market competitiveness. Promote the use of e-commerce platforms and digital marketing tools to help business entities more effectively reach consumers and expand their markets. Explore cooperation models with large e-commerce platforms, utilizing their technology and market resources to help new agricultural operators quickly enter the e-commerce field and increase their willingness.

Enhancing the e-commerce acumen of business entities, bolstering policy advocacy and technical training initiatives, and fostering a conducive e-commerce ecosystem can significantly amplify their propensity to engage in e-commerce sales. These measures are essential for overcoming the challenges faced by new agricultural operators and maximizing the potential of rural e-commerce in driving rural economic development.

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