

The Research on the Influencing Factors of Agricultural Product Sales: A Case Study of Xinzheng City

Xiaoli Song*

Zhengzhou University of Industrial Technology, School of Software, Zhengzhou, 450064, China

*Corresponding author: 13164393060@163.com

Abstract: The sale of agricultural products is closely related to people's livelihoods and is also critical to agricultural development and rural construction. To identify the factors influencing the sales of agricultural products, a study was conducted on agricultural practitioners, consumers, and supermarket operators within Xinzheng City. Through literature research, a model of influencing factors for agricultural product sales was developed. Based on this model, regression analysis was employed to process and analyze the data obtained from the questionnaires. The study found that all 14 hypotheses under the three dimensions of product, infrastructure, and policy were valid. Subsequently, recommendations and strategies to promote agricultural product sales were proposed.

Keywords: Agricultural product sales; regression analysis; questionnaire survey

1. Introduction

Regional agricultural development helps accelerate the process of building beautiful rural areas, promotes regional economic growth, and effectively improves the living standards of local people. Agricultural development is closely tied to the sale of agricultural products, and the sales status of agricultural products directly affects the survival and development of farmers and agricultural enterprises, as well as the quality of life for ordinary people. Therefore, exploring the factors influencing agricultural product sales is of significant practical importance.

The sales of agricultural products are influenced by a variety of factors. Based on existing literature, the current factors affecting regional agricultural product sales are mainly concentrated in the following areas: Firstly, from the product perspective, with the increase in income and changes in consumer concepts, the idea of green agricultural products has become more prominent. As a result, there is a growing emphasis on healthy eating concepts during agricultural product sales to meet market trends^[1]. Additionally, given the long production cycles and numerous stages involved in agricultural products, the perception of product quality and safety is often difficult to ascertain during actual sales. Issues such as pesticide, veterinary drug residues, and hormone contamination may further exacerbate the crisis of quality perception^[2]. Agricultural product pricing plays an important role in guiding sales, and price guidance services can help e-commerce platforms and agricultural products establish a long-term competitive relationship, thereby promoting market sales^[3]. For agricultural products with distinctive geographical indications, brand building helps ensure product quality and safety, promotes green agricultural production, and fosters the sustainable and healthy development of the regional industry^[4]. Secondly, from the policy perspective, agricultural policies implemented by the government at the national and local levels serve as a solid foundation for regional agricultural development and are a strong support for the safe and orderly sale of agricultural products. These policies effectively promote the sales of agricultural products^[5]. Furthermore, the implementation and enforcement of policies contribute to the favorable development of national macro-agriculture^[6]. Finally, from the infrastructure perspective, the level of development in agricultural logistics systems and standardized production significantly influences agricultural product quality, promotes sales, and enhances consumers' shopping experience^[7-9]. At the same time, various e-commerce platforms have increasingly entered the agricultural product market, injecting new vitality into agricultural product sales^[10]. Moreover, a convenient and efficient payment system helps promote the deep development of agricultural e-commerce and further enhances consumers' sense of security^[11]. In addition, the credit rating of agricultural industry practitioners helps enhance consumers' shopping confidence and promotes agricultural product sales^[12].

In conclusion, agricultural production and sales cover a wide range of factors. To promote the sale of agricultural products, effectively raise the income levels of agricultural practitioners, and advance the sustainable development of regional agriculture, exploring the influencing factors of agricultural product sales is of significant practical importance.

2. Theoretical Foundation and Model Construction

2.1 Theoretical Foundation

The Expectancy Confirmation Theory (ECT) analyzes the changes in satisfaction based on factors such as expectations, performance, and confirmation. The Theory of Planned Behavior (TPB) studies consumer behavior from five key aspects: attitude, subjective norms, perceived behavioral control, behavioral intention, and behavior^[13]. This paper, based on these two major theories, explores the influencing factors of agricultural product sales among a wide range of consumers and relevant agricultural producers within Xinzheng City.

2.2 Model Construction

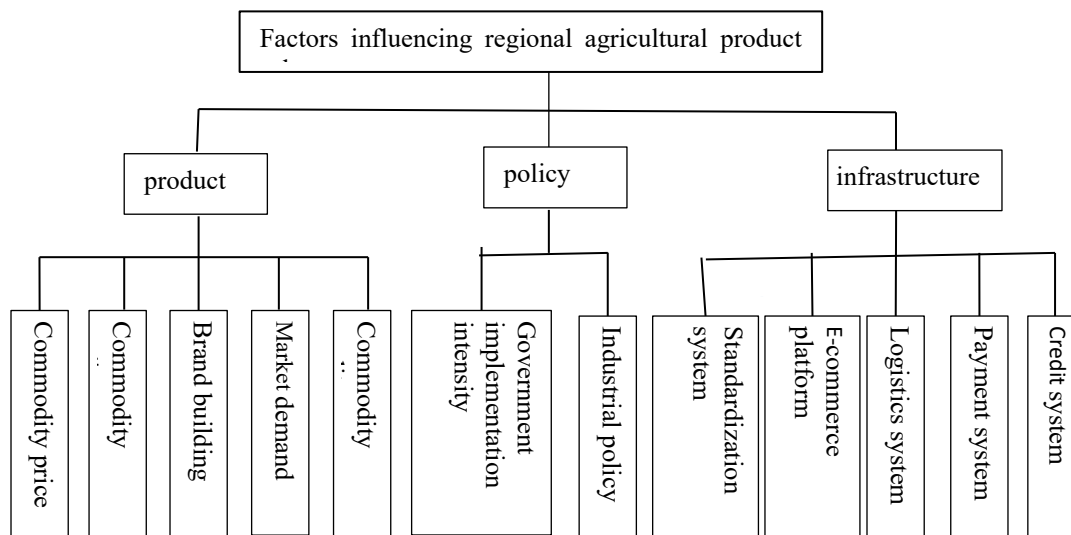


Figure 1: Model of influencing factors of agricultural product sales

By reviewing relevant literature and considering the current industry situation, it was found that the influencing factors of agricultural product sales in Xinzheng City are primarily concentrated in three dimensions: product, policy, and infrastructure. Further analysis revealed that the product dimension includes five indicators: product price, product attributes, product quality, brand development, and market demand. The policy dimension includes two indicators: industrial policy and policy implementation strength. The infrastructure dimension consists of five indicators: standardization system, e-commerce platforms, logistics system, payment system, and credit system. Based on this, a model of influencing factors for regional agricultural product sales was constructed, as shown in Figure

3. Analysis of the Influencing Factors on Agricultural Product Sales

In the process of economic activities, products play a crucial role in a company's revenue. Agricultural products often have characteristics such as heavy weight and perishable nature, which to some extent affect their sales. Agricultural products are diverse and widespread in daily life, providing essential nutrients to people. Therefore, the quality of agricultural products largely determines whether consumers will engage in purchasing behavior. Market demand research can help businesses or merchants sell agricultural products and improve economic benefits. With the development and upgrading of agriculture, an increasing number of companies have begun to build their brands, creating distinctive agricultural product brands, which further enhance the added value of agricultural products and promote the sales

scale of various agricultural products. Overall, agricultural products themselves play a positive role in promoting sales. Therefore, Hypothesis H1 is proposed: Products have a positive effect on the sales of agricultural products.

A detailed analysis reveals that product price, product attributes, and agricultural product sales all show a negative correlation. The higher the product quality, the greater the market demand, and the more established the brand, the better the sales of agricultural products. Based on this, the following hypotheses are proposed:

- H1a: Product price negatively affects agricultural product sales;
- H1b: Product attributes negatively affect agricultural product sales;
- H1c: Product quality positively affects agricultural product sales;
- H1d: Market demand positively affects agricultural product sales;
- H1e: Brand development positively affects agricultural product sales.

National and regional policies are important supports for agricultural development. With the update and improvement of industrial policies, agricultural product sales have encountered new opportunities, significantly enhancing the enthusiasm and confidence of relevant practitioners, and strongly promoting the development of agricultural product sales. At the same time, the implementation and enforcement of policies effectively safeguard agricultural development and the sale of agricultural products. Therefore, Hypothesis H2 is proposed: Policies have a positive impact on agricultural product sales.

A detailed analysis shows that the more comprehensive the industrial policy, the more it contributes to agricultural product sales. The greater the strength of policy implementation and the more thoroughly it is enforced, the more it benefits agricultural product sales. Based on this, the following hypotheses are proposed:

- H2a: Industrial policies positively affect agricultural product sales;
- H2b: The strength of policy implementation positively affects agricultural product sales.

Infrastructure is an important component of agricultural production and trade. Its level of development affects all aspects of agricultural product production and transactions, and it has a significant impact on agricultural product sales. Among these, the logistics system provides essential support for agricultural product sales, ensuring that products can reach various sales terminals quickly and safely. E-commerce platforms leverage internet channels to effectively coordinate and integrate information flow, goods flow, and capital flow, thus promoting agricultural product sales. The payment system offers consumers diversified and convenient payment options, which enhances the shopping experience and user satisfaction, actively boosting agricultural product sales. The credit system provides an effective credit barrier for agricultural e-commerce transactions, thereby reducing the uncertainty and risks associated with agricultural product sales to some extent. Therefore, Hypothesis H3 is proposed: Infrastructure has a positive impact on agricultural product sales.

Specifically, the more developed the logistics system, the more mature the e-commerce platform, the more convenient the payment system, the more authoritative the credit system, and the more standardized the system, the greater the positive impact on agricultural product sales. Based on this, the following hypotheses are proposed:

- H3a: The logistics system positively affects agricultural product sales;
- H3b: E-commerce platforms positively affect agricultural product sales;
- H3c: The payment system positively affects agricultural product sales;
- H3d: The credit system positively affects agricultural product sales;
- H3e: The standardization system positively affects agricultural product sales.

4. Data Collection and Analysis

4.1 Data Collection

The research data was collected through a survey questionnaire, with the study area covering Xinzheng City in Henan Province (mainly including model villages such as Taishan Village and Heli Village). The survey respondents were primarily agricultural practitioners, consumers, and business operators engaged in agriculture, sales, and related industries. The questionnaire consisted of 20 items, which were appropriately numbered and logically organized. The survey was conducted from June to September 2023, with a total of 135 completed questionnaires collected. After excluding invalid responses, 121 valid questionnaires were retained, yielding an effective response rate of 89.63%.

4.2 Data Analysis

The analysis was based on the 121 valid questionnaires, with statistical analysis conducted on the respondents' basic information, including gender, age, education level, and occupation. According to the statistics, the gender ratio of respondents was relatively balanced. The majority of respondents were aged between 18 and 29. Most respondents had a higher education level, and the largest group by occupation was students, followed by agricultural practitioners. Among all respondents, 72.73% had purchased agricultural products from Xinzheng City. This indicates that agricultural product sales are targeted at a gender-neutral, young demographic with a relatively high education level. Additionally, since a large number of respondents had made purchases and the occupation distribution primarily consisted of students and agricultural practitioners, the opinions and suggestions of both consumers and agricultural practitioners on the factors affecting agricultural product sales could be effectively analyzed, ensuring the validity and relevance of the study.

The research then explored the factors affecting agricultural product sales from three dimensions: product, policy, and infrastructure. The data analysis revealed that there were relatively small differences in the average scores across the measurement items. However, overall, product quality, e-commerce platforms, and market demand had the most significant impact on agricultural product sales, with average scores of 8.21, 8.17, and 8.16, respectively. To further clarify the factors influencing agricultural product sales, the study conducted reliability and validity analysis, as well as regression analysis, to verify the hypotheses and results, and identify the specific factors affecting agricultural product sales.

Reliability analysis revealed that the Cronbach's alpha coefficients for the three dimensions—product, infrastructure, and policy—were 0.89, 0.95, and 0.93, respectively, all exceeding 0.80, indicating good reliability for the data in these dimensions, which met the research requirements. The overall Cronbach's alpha coefficient for the entire questionnaire was 0.960, indicating a high level of reliability, which demonstrates that the questionnaire was well-designed, with scientifically structured items, and good consistency and reliability. The Kaiser-Meyer-Olkin (KMO) value was 0.94, and the Bartlett's test of sphericity yielded a significance level of 0.00, indicating that the questionnaire had good structural validity, that there were correlations between the hypotheses, and that the data was suitable for factor analysis. The factor analysis results showed a cumulative variance contribution rate of 83.47%, suggesting that the questionnaire items retained significant information, that the measurements were reasonable for the study, and that the variables were well explained. The overall results indicated that the questionnaire had good validity and could meet the research requirements.

To further verify the aforementioned hypotheses, the study performed regression analysis on the questionnaire data using SPSS, based on the three dimensions and a total of 12 measurement items. Agricultural product sales were taken as the dependent variable Y, with product, infrastructure, and policy as the independent variables X₁, X₂, and X₃, respectively. Based on this, a multiple linear regression model was established:

$$Y = \alpha_0 + \alpha_1 X_1 + \alpha_2 X_2 + \alpha_3 X_3 + \varepsilon$$

In the equation, α_i (i=0, 1, 2, 3) represents the overall regression parameters, and ε is the random error term, indicating other random influencing factors. The results of the regression analysis show that the D-W value is 1.861, which is less than 2, indicating that there is no autocorrelation between the variables, and the model is well-constructed. The F-value of 14.775 corresponds to a significance level of P = 0.000, which is less than 0.050, indicating that the regression model is meaningful. Additionally, the results show that the maximum VIF value is 6.119, which is well below 10, suggesting that there are no multicollinearity issues in the study, making the data suitable for research. The study also finds that

product quality positively impacts agricultural product sales ($\alpha_1 = 0.721$, $P = 0.000$), thus supporting hypothesis H1; infrastructure positively impacts agricultural product sales ($\alpha_2 = 0.635$, $P = 0.000$), thus supporting hypothesis H2; and policy positively impacts agricultural product sales ($\alpha_3 = 0.732$, $P = 0.000$), thus supporting hypothesis H3.

To clarify the relationship between each measurement item and agricultural product sales, a further regression analysis was conducted, with the results shown in Table 1-1. Based on the above data, it can be concluded that all 14 hypotheses are valid.

table1-1: Regression analysis of each measurement item

	hypothesis	coefficient	p-value	Established
H1a	Commodity price → Sales of agricultural products (-)	0.586	0.000	Yes
H1b	Commodity attribute → Sales of agricultural products (-)	0.533	0.000	Yes
H1c	Commodity quality → Sales of agricultural products (+)	0.606	0.000	Yes
H1d	Market demand → Sales of agricultural products (+)	0.604	0.000	Yes
H1e	Brand building → Sales of agricultural products (+)	0.660	0.000	Yes
H2a	Industrial policy → Sales of agricultural products (+)	0.684	0.000	Yes
H2b	Intensity of policy implementation → Sales of agricultural products (+)	0.732	0.000	Yes
H3a	Logistics system → Sales of agricultural products (+)	0.600	0.000	Yes
H3b	E-commerce platform → Sales of agricultural products (+)	0.603	0.000	Yes
H3c	Payment system → Sales of agricultural products (+)	0.563	0.000	Yes
H3d	Credit system → Sales of agricultural products (+)	0.585	0.000	Yes
H3e	Standardization system → Sales of agricultural products (+)	0.573	0.000	Yes

5. Conclusion

Based on the above research findings, to better promote agricultural product sales in the Xinzheng region, the following aspects should be prioritized.

5.1 Emphasize Industry Policies and Leverage Policy Advantages

Agricultural product transactions need to keep pace with policy developments and should focus on "industry policies" when carrying out sales activities. By using policies as guidance, resources should be concentrated on developing agricultural product-related businesses, fully utilizing the advantages and support provided by policies.

5.2 Establish a Sound Product System and Build Regional Brands

Currently, the Xinzheng region has established agricultural industry demonstration villages and model villages, such as those specializing in strawberries, watermelons, and dates, which have gained a certain level of recognition. In the future, the sales process of agricultural products should focus on promoting specialty products, establishing a comprehensive product system, developing derivative products, and further increasing the added value of agricultural products. At the same time, emphasis

should be placed on brand building, creating a brand effect, and moving towards brand-based development.

5.3 Strengthen Infrastructure Construction and Improve Service Levels

Infrastructure is a crucial support for agricultural product transactions, and under the current circumstances, it is essential to actively promote infrastructure development. Standardization systems should be used to regulate agricultural production and sales. Logistics networks should ensure the transportation and storage of agricultural products, while payment systems and e-commerce platforms should provide consumers with a positive shopping experience and improve consumer satisfaction. In addition, strengthening the credit systems for both buyers and sellers is necessary to create a good market order, encouraging widespread consumer participation and satisfaction.

Fund Project

Research on Promoting the Construction of Beautiful Villages Driven by Model Villages and Demonstration Villages (2023YB044)

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