The Research on the Factors of Purchase Intention for Fresh Agricultural Products in an E-Commerce Environment

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Abstract. Based on the characteristics of e-commerce of fresh agricultural products in China, and using the correlation analysis method, the relational model between product knowledge, perceived benefit, perceived risk and purchase intention is constructed. The Logistic model is used to carry in the empirical analysis. The influence factors and the mechanism of online purchase intention are explored. The results show that consumers' product knowledge, perceived benefit and perceived risk can affect their purchase intention. Consumers' product knowledge has a positive effect on perceived benefit and perceived benefit has a positive effect on purchase intention. Consumers' product knowledge has a negative effect on perceived risk, and perceived profit has a negative effect on perceived risk, and perceived risk has a negative effect on purchase intention. Through the empirical analysis, some feasible suggestions for the government and electricity supplier enterprises can be provided.

1. Introduction
As an emerging form of agricultural products circulation, e-commerce of agricultural products has played an important role in improving the circulation efficiency of agricultural products and the competitiveness of agricultural products. The important influence on the rural economic development, the rural industrial structure optimization, the agricultural production mode transformation and consumers' consumption mode has taken place. "The central document no. 2017" released in December 31, 2016 points out "support the construction of e-commerce platform of agricultural products, improve the supplying direct system of fresh agricultural products, and promote the 'Internet +' modern agricultural action", which puts forward a specific policy support for e-commerce of agricultural products.

According to the report of "China's fresh consumer trends report", it is reported that fresh electricity business market had soared from 4 billion RMB to 95 billion RMB from 2012 to 2016. The current urban fresh consumption about 7 percent has occurred online. It is expected that online fresh consumption will continue to maintain the growth momentum, and account for 15-25 percent of urban fresh total consumption in 2020. At present, fresh agricultural products shopping sites have been emerging, such as womai.com, tootoo.cn, and benlai.com. But in the current fresh agricultural electricity market, almost most of them are in a state of loss operation. It was reported by xinhuanet.com that Shanghai cuisine steward invested 35 million RMB, but it is now in the stage of loss of operation. The field of fresh agricultural electricity business has been hailed as "the last blue ocean" of China, and the market has great prospects. But for the natural high standard for quality and
delivery speed, high frequency of consumption, low unit price, short shelf life characteristics, e-commerce of fresh agricultural products is also described as "the most difficult bone to chew". It takes fresh agricultural products as the research object, and deeply studies consumers' purchase intention and the related influencing factors of fresh agricultural products in an e-commerce environment, and explores consumers' decision-making mechanism, which has an important significance for guiding the fresh agricultural enterprise marketing practice.

It first analyzes the overall reasons that affect consumers' purchase intention in an e-commerce environment, and then determines the reasons according to the specific situation, mainly including consumers' product knowledge, perceived benefit and perceived risk for fresh agricultural products. Through the correlation analysis method, it can analyze how these three factors affect each other and how to affect consumers' purchase intention for fresh agricultural products. Through the online and offline questionnaire investigation, the data is collected. Through SPSS, the Logistic model is constructed, and the correlation analysis method is used to study the relationship of variables. The relationship between product knowledge, perceived benefit and perceived risk of consumers and the correlation between them and consumers' purchase intention are studied.

2. Research hypotheses and model framework

2.1. Research framework

By studying consumers' purchase intention for fresh agricultural products in an e-commerce environment, it can learn that consumers' purchase intention is related to product knowledge, perceived benefit and perceived risk. According to the research conclusion of Wu Chunxia, it can construct the research framework with the comprehensive research in this paper.

![Figure 1 Research Framework](image)

2.2. Research hypothesis

According to the research framework, it further analyzes the relationship between the three factors that affect consumers' purchase intention for fresh agricultural products and their impact on the purchase intention. It makes the following assumptions.

$H_1$: Product knowledge of consumers for fresh agricultural products has a positive effect on perceived benefit in an e-commerce environment.

$H_2$: Product knowledge of consumers for fresh agricultural products has a negative effect on perceived risk in an e-commerce environment.

$H_3$: Perceived benefit of consumers for fresh agricultural products has a negative effect on perceived risk in an e-commerce environment.

$H_4$: Perceived benefit of consumers for fresh agricultural products has a positive effect on purchase intention in an e-commerce environment.

$H_5$: Perceived risk of consumers for fresh agricultural products has a negative effect on purchase intention in an e-commerce environment.

3. Empirical Verification
3.1. Scale design and variable measurement

It adopts questionnaire investigation to verify the theoretical model and research hypothesis, makes product knowledge (PK), perceived benefit (PB) and perceived risk (PR) as the independent variables that affect consumers’ purchase intention and purchase intention (PI) as the result variable. The scale used in the paper is based on the previous research and combined with the results of the focus group interviews. It draws on the foreign literature maturity scale, and respectively makes each variable to develop three to five questions as indicators with reference to the surrounding people and consumers shopping fresh goods online. In order to ensure good reliability and validity, three experts in agricultural e-commerce field were invited to make suggestions on the scale, and some improvements were made to the scale on the basis of expert opinions. The 5-level Likert scale is adopted in the paper, and level 1-5 respectively expresses complete disagreement, disagreement, general agreement, comparative agreement, and complete agreement.

3.2. Data sources and sample characteristics analysis

The data is based on the online questionnaire survey and the offline questionnaire survey conducted by the research team from April to June this year. The online survey was conducted by questionnaires (http://www.sojump.com), and the offline survey was conducted on a field trip to Jinan, Qingdao and other places. On the choice of research object, the method of random survey is adopted, but the principle of not repeating interviews with the same family member is insisted, which can ensure the objectivity and scientificness of the survey data. A total of 485 questionnaires were obtained from the questionnaire, and the effective rate was 97 percent.

| Characteristic variable | Type          | Number of respondents | Ratio (%) |
|-------------------------|---------------|-----------------------|-----------|
| Sex                     | male          | 239                   | 49.28     |
|                         | female        | 246                   | 50.72     |
| Age                     | Under 18      | 7                     | 1.44      |
|                         | 18-25         | 215                   | 44.33     |
|                         | 26-35         | 156                   | 32.17     |
|                         | 36-50         | 78                    | 16.08     |
|                         | Above 51      | 29                    | 5.98      |
| Education               | under university | 67                   | 13.81     |
|                         | junior college | 96                    | 19.79     |
|                         | bachelor      | 197                   | 40.62     |
|                         | postgraduate  | 125                   | 25.78     |

In the surveyed population, the number of people shopping fresh agricultural products online reaches 319, which is accounted for 65.77 percent, so we can fully understand consumers’ purchase intention for fresh agricultural products in an e-commerce environment. However, there are the respondents who did not buy fresh agricultural products online accounted for 34.23 percent, which shows that it still needs to be more aggressive propaganda. The number of the effective questionnaire is 319 excluding the people not shopping fresh agricultural products online. 319 questionnaires are used for data analysis in the following analysis. In general, the survey data is representative, which can reflect consumers’ purchase intention for fresh agricultural products online through the data.

3.3. Analysis of reliability and validity

The survey data needs to analyze the reliability to ensure the final conclusion of the study accurately by SPSS20.0. The methods of reliability analysis include test-retest reliability, parallel-forms reliability and so on. Using SPSS20.0 to analyze the reliability of the scale, the value of Cronbach $\alpha$ of the four variables is 0.653, 0.802, 0.721, 0.704, which shows that the reliability of the measurement scale is high. It needs to examine the validity to ensure the data of the scale. The fourteen indexes of the four measurement scales are analyzed by SPSS20.0, and the value of KMO (0.638, 0.799, 0.719,
0.669) and Bartlett spherical (135.350, 377.880, 262.272, 173.305) are obtained. The results show that the questionnaire has a good validity.

3.4. Empirical model and analysis results

3.4.1. Model selection. In order to study consumers' purchase intention for fresh agricultural products, it adopts the correlation analysis method, constructs the Logistic model, and then uses the model to analyze the relationship between the variables and test the hypothesis. Correlation analysis methods used commonly include Pearson, Kendall and Spearman. It uses Spearman correlation coefficient for the study in the paper.

According to the five hypotheses proposed in the paper, the Logistic model is established as follows.

The empirical Logistic model of consumers' purchase intention for fresh agricultural products:

\[ Y = F(X_1, X_2, X_3) \]

\[ Y \text{ means consumers' purchase intention for fresh agricultural products. } X_1 \text{ means product knowledge of consumers for fresh agricultural products. } X_2 \text{ means perceived benefit of consumers for fresh agricultural products. } X_3 \text{ means perceived risk of consumers for fresh agricultural products. Each factor is made up of several variables, and it amounts to 11 variables.} \]

\[ Y = 0 \text{ means that consumers have no intention to buy fresh agricultural products. } Y=1 \text{ means that consumers have an intention to buy fresh agricultural products.} \]

\[ X_1 = f(x_1, x_2, x_3) \]

\[ X_2 = f(x_4, x_5, x_6, x_7) \]

\[ X_3 = f(x_8, x_9, x_{10}, x_{11}) \]

\[ x_1 \text{ means the consumers' cognition for fresh agricultural products. } x_2 \text{ means consumers' understanding the extent of e-commerce platform of fresh agricultural products. } x_3 \text{ means consumers' concerns of the fresh agricultural products information in an e-commerce platform.} \]

\[ x_4 \text{ means the convenience of consumers shopping fresh agricultural products online. } x_5 \text{ means the price of consumers shopping fresh agricultural products online. } x_6 \text{ means the information richness of the e-commerce platform.} \]

\[ x_7 \text{ means the service quality of the e-commerce platform.} \]

\[ x_8 \text{ means consumers' shopping experience online. } x_9 \text{ means the degree of trust in shopping online in an e-commerce environment. } x_{10} \text{ means the appearance and freshness of fresh agricultural products in an e-commerce environment.} \]

\[ x_{11} \text{ means the logistics packaging and distribution of fresh agricultural products in an e-commerce environment.} \]

3.4.2. Verification hypothesis.

(1) Verify hypothesis H1

It can be seen that the correlation coefficient between the items of product knowledge and the items of perceived benefit is positive, and the correlation of each variable is significant at the level of 0.01, which shows that product knowledge has a positive effect on perceived benefit. So it can be proved that H1 is tenable. The specific analysis results are shown in table 2.

|   | PP2 | PP3 | PP4 |
|---|-----|-----|-----|
| PK1 | 0.255** | 0.284** | 0.265** |
| PK2 | 0.449** | 0.415** | 0.439** |
| PK3 | 0.287** | 0.295** | 0.400** |
knowledge is, the weaker perceived risk is, which can be proved that $H_2$ is tenable. The specific analysis results are shown in table 3.

| Table 3 the correlation analysis of $H_2$ |
|-----------------------------------------|
| PR1 | PR2 | PR3 | PR4 |
| PK1 | 0.295** | 0.252** | 0.314** | 0.298** |
| PK2 | 0.341** | 0.468** | 0.387** | 0.343** |
| PK3 | 0.193** | 0.247** | 0.274** | 0.300** |

(3) Verify hypothesis $H_3$

The correlation between perceived benefit and perceived risk is analyzed by SPSS20.0. It shows that there is a positive correlation between them, and it is significant at the level of 0.01. The results show that the stronger perceived benefit is and the weaker perceived risk is during the survey, which shows that perceived benefit has a negative effect on perceived risk. So it can be proved that $H_3$ is tenable. The specific analysis results are shown in table 4.

| Table 4 the correlation analysis of $H_3$ |
|-----------------------------------------|
| PR1 | PR2 | PR3 | PR4 |
| PP1 | 0.236** | 0.320** | 0.345** | 0.334** |
| PP2 | 0.260** | 0.387** | 0.386** | 0.315** |
| PP3 | 0.169** | 0.356** | 0.251** | 0.348** |
| PP4 | 0.259** | 0.364** | 0.365** | 0.297** |

(4) Verify hypothesis $H_4$

It can be seen that the correlation coefficient between the items of perceived benefit and the items of purchase intention is positive, and the correlation of each variable is significant at the level of 0.01, which shows that perceived benefit has a positive effect on purchase intention. So it can be proved that $H_4$ is tenable. The specific analysis results are shown in table 5.

| Table 5 the correlation analysis of $H_4$ |
|-----------------------------------------|
| PI1 | PI2 | PI3 |
| PP1 | 0.295** | 0.396** |
| PP2 | 0.359** | 0.442** |
| PP3 | 0.329** | 0.347** |
| PP4 | 0.335** | 0.439** |

(5) Verify hypothesis $H_5$

The correlation between perceived risk and purchase intention is analyzed by SPSS20.0. It shows that there is a positive correlation between them, and it is significant at the level of 0.01. The results show that the stronger perceived risk is and the weaker purchase intention is during the survey, which shows that perceived risk has a negative effect on purchase intention. So it can be proved that $H_5$ is tenable. The specific analysis results are shown in table 6.

| Table 6 the correlation analysis of $H_5$ |
|-----------------------------------------|
| PI1 | PI2 | PI3 |
| PR1 | 0.189** | 0.138** |
| PR2 | 0.369** | 0.365** |
| PR3 | 0.337** | 0.405** |
| PR4 | 0.336** | 0.386** |
3.4.3. **Hypotheses test.** Through the test of the five hypotheses of H1, H2, H3, H4 and H5, it can find that consumers' product knowledge, perceived benefit and perceived risk for fresh agricultural products have an effect on purchase intention in an e-commerce environment. Consumers' product knowledge for fresh agricultural products directly affects its perceived benefit and perceived risk. Consumers' product knowledge for fresh agricultural products is richer, perceived benefit is stronger, and perceived risk is weaker. Consumers' product knowledge for fresh agricultural products indirectly affects its purchase intention through the influence of perceived benefit and perceived risk for fresh agricultural products. Consumers' perceived benefit for fresh agricultural products is related to its perceived risk, perceived benefit for fresh agricultural products is stronger and its perceived risk is weaker. Consumers' perceived benefit and perceived risk for fresh agricultural products directly affects its purchase intention respectively in an e-commerce environment. Consumers' perceived benefit for fresh agricultural products is stronger and its perceived risk is weaker, its perceived risk is weaker and its purchase intention is stronger.

4. **Research conclusions and recommendations**

According to the research conclusions, for product knowledge of consumers, it is necessary for e-commerce platform of fresh agricultural products to intensify propaganda, improve the cognitive level of consumers, and attract consumers' attention. The preservation methods of fresh agricultural products and the fresh recipes about fresh aquatic products can be introduced to consumers by e-commerce platform of fresh agricultural products, which can stimulate the interest of consumers and attract consumers shopping fresh agricultural products. For perceived benefit of consumers, it should be necessary for the platform to enrich the varieties of fresh agricultural products, take a reasonable pricing strategy, attract consumers by taking the safety and reliability of fresh agricultural products as the leading factor, and improve the service consciousness. It is also necessary for the platform to interact with consumers, understand the problems and solve the problems in a timely and reasonable manner, and strengthen consumer's purchase confidence. For perceived risk of consumers, electricity enterprise should strictly control the quality of fresh agricultural products to ensure to sell fresh agricultural products safety and healthily, and improve the quality and level of logistics services to make consumers to enjoy the fresh agricultural products timely and quickly. Electronic enterprise should pay attention to the brand in the process of development, build its own business brand, improve its own brand awareness, and enhance consumers' purchase intention with the brand.

**Acknowledgments**

This research is supported by National Philosophy and Social Science Foundation of China (Grant No. 17BGL017), Philosophy and Social Science Foundation of Shandong (Grant No. 16CGLJ02) and University Humanities and Social Science Foundation of Shandong (Grant No. J17RA131), all support is gratefully acknowledged.

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