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Factors Influencing Chinese Online Shopping Distributions of Fresh Agricultural Products

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Abstract

Purpose: With the emergence of high technology in China, online shopping distribution of fresh agricultural products have been developing rapidly. This study built a model to investigate how perceived quality of products and logistic services, perceived risk, and perceived cost affect intention to buy fresh agricultural products in an Internet environment. Especially, in the purchasing process, attitude may work as an important mediator. **Research design, data and methodology:** To achieve the objectives of this study, Chinese respondents were asked to fill in a questionnaire through the China online survey website. With 520 available data, regression analysis was used to test the hypotheses. **Results:** Results indicate that perceived quality of fresh agriculture products and perceived logistics service quality have a significant positive impact on attitude and purchase intention. Results also reveal that perceived risk and perceived cost affect attitude and purchase intention negatively. Finally, results imply that attitude has a positive effect on purchase intention, which is the unique mediator in the online shopping process. **Conclusions:** This study suggests that managers in the online shopping distributions of fresh agricultural products should improve the quality of products and logistics services along with the reduction of the perceived risk and cost to compete in the China market.

Keywords : Perceived Quality; Perceived Risk; Perceived Cost; Attitude; Purchase Intention

JEL Classification Code : L81, M31, Q13

1. Introduction

With the development of high technology, Internet has been emerging in China recently. According to the reports presented by the China Internet Network Information Center (CNNIC, 2020), at the end of March 2020, the number of Chinese Internet users is 904 million, which is

75.08 million more than in 2018. The Internet penetration rate is 64.5%, an increase of 4.9 % from 2018. With the emergence of the Internet, online shopping has become one of the most important activities for netizens. According to the data released by CNNIC (2020), the scale of online shoppers in China has reached 710 million at the end of March 2020, an increase of 100 million from 2018, which is 78.6% of the total Internet users. Among different online shopping markets, the industry of fresh agricultural products has been increasing rapidly. In 2019, the transaction size in 2019 was 279.62 billion RMB, which has increased by 36.7% as compared to 2018 (iResearch, 2020). Especially, due to Corona Virus Disease 2019 (COVID-19), fresh agricultural products online shopping has attracted more attention from consumers. It is predicted that the scale of this market will reach 800 billion RMB in

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2023 (iResearch, 2020). Therefore, practitioners and academics make efforts to understand the market and recommend the best strategies to develop the industry of fresh agricultural products.

Fresh agricultural products, including vegetables, fruits, meat, and aquatic products, are regarded as perishable due to their short lifecycle (Yan, Chen, Cai, & Guan, 2020). The perishability of fresh agricultural products increases the difficulty of supply chain management. Therefore, most researchers pay attention to the management of fresh agricultural product supply chains (Ahumada, Villalobos, & Mason, 2012; Rong, Akkerman, & Grunow, 2011; Widodo et al., 2006). Little focus on consumer behavior to investigate the major factors that may influence consumers' shopping decisions of fresh agricultural products in an Internet environment (Yan et al., 2020). Although some researchers have carried out empirical studies to estimate that perceived product quality and logistics service quality play an important role in the purchasing process of fresh agricultural products in the E-commerce context (Gao et al., 2020; Gu et al., 2019), it is insufficient to understand online shopping behavior of fresh agricultural products. It is because generally, consumers make a purchase decision that can bring the greatest benefits to themselves with the minimum cost. In other words, perceived risk and perceived cost are also the important determinants of consumers' behavior (Anwar, Thongpapanl, & Ashraf, 2020; Featherman & Pavlou, 2003; Yan et al., 2020). However, there are few related studies to explain the effects of perceived risk and perceived cost on consumer's online shopping behavior of fresh agricultural products. Therefore, this study builds a research model to explore the major factors which have important roles in the online shopping process of fresh agricultural products. The purpose of this research is to estimate that perceived fresh agricultural product quality, perceived logistics service quality, perceived risk, and perceived cost affect consumers' attitude and purchase intention. The other objective of this study is to investigate the mediation effect of attitude in the purchasing process. With the interesting results of this study, implications for developing the online shopping industry of fresh agricultural products in China are discussed.

2. Literature Review

2.1. Perceived Quality

Quality refers to the conformance to requirements (Crosby, 1979). Perceived quality stresses overall unidimensional evaluative judgments depending on consumers' perceptions, demands, and goals (Steenkamp, 1990). Especially in products and services, the attainment

of perceived quality is arguably the most important concern for consumers to make a purchase decision (Parasuraman, Zeithaml, & Berry, 1985, 1988). In the E-commerce market, perceived product quality is related to consumers' purchase decisions of their online shopping experience directly and the logistics service quality determinants if consumers can get fresh agricultural products in time. Therefore, in this study, we understand perceived quality through perceived product quality and perceived logistics service quality.

2.1.1. Perceived Product Quality

Perceived product quality is the idiosyncratic value judgement of a product to provide fitness for consumption based on the relevant quality attributes (Steenkamp, 1990; Kim & Lee, 2016). Accordingly, perceived quality of fresh agricultural products can be defined as consumers' subjective evaluation with consumption experiences according to the relative characteristics.

Steenkamp (1990) studied attributes that may affect perceived product quality and found that product characteristics would be concluded as intrinsic and extrinsic cues. Extrinsic cues are product-related attributes but not part of the physical product, including price, brand name, and packaging. Intrinsic cues represent indigenous product-related attributes such as ingredients, freshness, and nutrition. With these arguments, Chung et al. (2006) did an empirical test and found that price, brand, packaging, taste, nutrition, and freshness are the critical factors of perceived product quality in the Indian market. They also suggest that the perceived product quality may be the driver for consumers to make a decision. In the online market of fresh agricultural products, even though Gao et al. (2020) have found the effect of perceived product quality on consumers' intention toward purchasing fresh agricultural products, the evidence is not enough for us to understand the consumption behavior wholly. Therefore, in this study, we focus on extrinsic and intrinsic attributes to investigate the perceived quality of fresh agricultural products and propose that it may be an important determinant in the online shopping process.

2.1.2. Perceived Logistics Service Quality

Parasuraman et al. (1985, 1988) put forward the concept of perceived product quality to understand service quality, believing that it is a subjective category depending on the actual perception as compared to the expectation. Thus, perceived logistics service quality can be defined as the quality standard or the assurance degree of logistics services to satisfy consumers' needs (Dai & Lee, 2018; Liu & Ke, 2012; Zeithaml, 1988).

The quality of logistics services is important in the online market of fresh agricultural products, because it has

a great effect on consumers' behavior (Chen & Tan, 2004; Gao et al., 2020). Most of the consumers who do online shopping want to receive fresh agricultural products in a timely and convenient manner. Those who can meet the consumers' needs would take advantage of this market. Therefore, online shopping distributors or retailers of fresh agricultural products should improve the quality of logistics services to provide more benefits (Gu et al., 2019).

2.2. Perceived Risk

Perceived risk was first introduced as a hypothetical and psychological construct when Bauer (1960) made efforts to explain information seeking and its effects on the purchase decision. Based on this study, Cox and Rich (1964) defined perceived risk as the nature and amount of risk perceived by a consumer in contemplating a particular purchase decision. In this study, perceived risk in the online market of fresh agricultural products is constructed as the perception of the loss by an Internet consumer attempting to achieve a specific set of buying goals.

Since the introduction in the marketing of perceived risk by Bauer (1960), much research has been carried out to utilize the ideas of risk and risk reduction processes in consumer decision-making (Bettman, 1973). Bettman (1973) built a model to estimate perceived risk and its components with an empirical test and found that inherent risk, handled risk, and percentage acceptable are the important factors to determine perceived risk. In the online environment, Featherman and Pavlou (2003) found that perceived risk is an important predictor of online service adoption intention. Lee (2009) made a hypothesis to study the influence of perceived risk on behavior intention in Internet banking. He found that perceived risk plays a negative role in the behavior intention of the banking adoption process. Kesharwani and Bisht (2012) supported the results by Lee (2009) and confirmed the negative effect of perceived risk in the Indian banking market. Little research explains the effects of perceived risk on the purchase behavior in the online market of fresh agricultural products. Thus, it is interesting to propose that perceived risk may play a major role in the online shopping process of fresh agricultural products.

2.3. Perceived Cost

Online shopping is generally perceived as risky and uncertain. It leads to an increase in consumers' perceived cost. Perceived cost in the E-commerce context refers to an individual's perception of the results while experiencing shopping fresh agricultural products online, which comprises evaluative effort required to pay more and to search information before purchasing along with specific

time investment for delivery (Anwar et al., 2020; Wu et al., 2014). Ahumada et al. (2012) suggest that perceived cost is an important determinant in the food supply chains. Thus, Yan et al. (2020) argue that perceived cost plays a critical role in the online shopping process of purchasing fresh agricultural products. However, no evidence can be found in the academic area. Therefore, this study focuses on the perceived cost to understand consumers' behavior of purchasing fresh agricultural products in an Internet environment.

2.4. Attitude

The term attitude has been long acknowledged as the most important construct in online shopping behavior (Al-Rafee & Cronan, 2006; Ajzen & Fishbein, 1980). It is defined as general favorable or unfavorable feelings to an object, stimulus, or issue (Fishbein & Ajzen, 1975; Hasan, 2010). In line with this definition, in this study, attitude toward online shopping is viewed as a consumer's positive or negative effect level toward the idea of buying fresh agricultural products. Such an attitude stimulates actions toward the object and would influence consumers' behavior. The positive relationship between attitude and consumer behavior have been well documented theoretically and empirically since the attitude-behavior study of Fishbein and Ajzen (1975). For example, Chen and Tan (2004) explain consumers' attitude toward the acceptance of the visual stores. Basha et al. (2015) have used the attitude model to investigate the positive effect of attitude on consumers' behavior in the organic food market. Thus, attitude is a critical predictor of consumers' behavior.

2.5. Purchase Intention

Purchase intention is a personal action tendency, which is very important because it has a decisive effect on the actual purchase behavior of consumers (Fishbein & Ajzen, 2010; Lee et al., 2014; Zeithaml et al., 1996). It is the conscious plan for consumers to meet a certain demand (Dodds et al., 1991), which is generally constructed by behavior intention, recommendation, and behavior continuousness (Zeithaml et al., 1996).

3. Methodology

3.1. Research Model

According to the existing research (e.g., Al-Rafee & Cronan, 2006; Anwar et al., 2020; Bettman, 1973; Gao et al., 2020; Steenkamp, 1990), this study constructs a research model about the factors influencing consumers'

online shopping intention of fresh agricultural products, which is shown in Figure 1. This study proposes that the perceived quality of fresh agricultural products, perceived logistics service quality, perceived risk, and perceived cost may affect consumers' attitude and purchase intention toward fresh agricultural products in an Internet environment. Moreover, it is proposed that attitude may be an important mediator in the online shopping process.

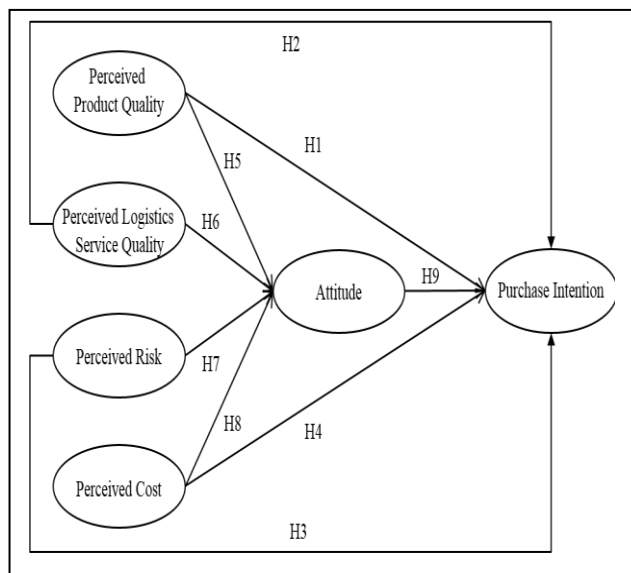


Figure 1: Research Model

3.2. Hypothesis Development

3.2.1. Perceived Product Quality and Purchase Intention

Scholars have paid more attention to estimate that perceived product quality can enhance consumers' intention of shopping. For example, Dodds et al. (1991) and Tsiotsou (2006) found that the higher the perceived product quality is, the greater the intention for consumers to buy the products. Later, some scholars confirmed the positive relationship between perceived product quality and consumption behavior in the food market (Truong & Nguyen, 2020; Wang, 2013). Additionally, Kim et al. (2014) found that perceived product quality has a positive impact on consumers' purchase intention of fresh agricultural products. In the late 1990s, online shopping becomes a particular method within the development of the Internet, which is in terms of the consumption experience and product performance. Therefore, perceived product quality is the most important determinant of consumers' willingness to shop online (Rosillo-Diaz et al, 2019; Wells

et al., 2011). Especially, Gao et al. (2020) believed the perceived quality of fresh agricultural products has a significant effect on purchase intention in the web-mediated environment. According to the literature, the hypothesis is proposed as follows:

H1: Perceived product quality has a positive effect on purchase intention.

3.2.2. Perceived Logistics Service Quality and Purchase Intention

On the other hand, as the subjective evaluation of E-commerce logistics services, it is a critical factor influencing consumers' online shopping behavior (Kuo et al., 2009; Zeithaml, 1988). When the quality of logistic services meets online shopping consumers' needs, their purchase intention would become greater. Chen and Tan (2004) believed that consumers' perceived quality of logistics services can significantly affect consumers' purchase intention. Gu et al. (2019) and Gao et al. (2002) confirmed that logistics service quality is the unique driver of consumers' intention toward purchasing fresh agricultural products. Thus, in terms of the existing research, the hypothesis is proposed as follows:

H2: Perceived logistics service quality has a positive effect on purchase intention.

3.2.3. Perceived Risk and Purchase Intention

Perceived risk has been used to verify consumers' behavior for a long time (Dowling, 1986; Forsythe & Shi, 2003; Tham et al., 2019; Tran, 2020). Cox and Rich (1964) suggested that perceived risk plays a critical role in consumers' telephone shopping decision-making process. In the online context, Forsythe and Shi (2003) verified that perceived risk affects Internet shopping behavior. Park, Lennon, and Stoel (2005) supported their suggestion and test the hypothesis of the negative relationship between perceived risk and purchase intention through an experiment. Kim and Lennon (2013) did an empirical test and found that the lower the perceived risk of shopping at the online retailer is, the greater the consumers' purchase intention toward the online retailer. Ariffin et al. (2018) supported their opinions and did a study to test the negative relationship between perceived risk and purchase intention. In the online market of fresh agricultural products, Yan et al. (2020) emphasized risk perceived by consumers is the important factor for them to make a decision. Therefore, it is reasonable to hypothesize that perceived risk affects the consumer's purchase intention negatively.

H3: Perceived risk has a negative effect on purchase intention.

3.2.4. Perceived Cost and Purchase Intention

Perceived cost is an important factor for consumers to make a purchase decision. Wu et al. (2014) proposed a framework to estimate that consumers' perceived cost such as time cost and monetary cost may have a negative effect on purchase intention in an online shopping context. Anwar et al. (2020) supported this argument that perceived cost plays a negative role in the shopping process. In the context of fresh agricultural products, Ahumada et al. (2012) and Yan et al. (2020) also believe that perceived cost plays a negative role in the buying process of fresh agricultural products. Thus, the hypothesis is proposed as follows:

H4: Perceived cost has a negative effect on purchase intention.

3.2.5. Perceived Product Quality and Attitude

Liska (1984) argued that attitude may be influenced by many factors. Perceived product quality is one of the important factors (Steenkamp, 1990). In organic food consumption research, Basha et al. (2015) suggest that the product quality perceived by consumers can enhance their attitude toward the product. Chung and Hwang (2016) also emphasized that perceived product quality is a relevant factor in consumers' attitudes toward fresh agricultural products. Therefore, it is proposed that there is a positive link between perceived product quality and attitude toward fresh agricultural products.

H5: Perceived product quality has a positive effect on attitude.

3.2.6. Perceived Logistics Service Quality and Attitude

The perceived logistics service quality is believed to influence consumers' attitude toward the online store (Amchang & Song, 2018; Chen & Tan, 2004). The greater the logistics service quality is perceived by the consumer, the greater the attitude toward the store online. Similar to the study of Chen and Tan (2004), Wu (2003) found that one of the beneficial factors which influence consumers' attitude toward online shopping is logistics service quality. Thus, it is proposed that consumers' perception of logistics service quality plays a significant role in determining attitude positively.

H6: Perceived logistics service quality has a positive effect on attitude.

3.2.7. Perceived Risk and Attitude

Perceived risk is the construct of uncertainty about potential outcomes of behavior and the possible unpleasantness of these outcomes (Forsythe & Shi, 2003;

Kim & Lennon, 2013; Nguyen, 2020). Generally, consumers cannot be sure the results of their purchase behavior are correct or not. Some of these results may make consumers unhappy. Thus, Eiser, Miles, and Frewer. (2002) suggested that perceived risk is the negative driver of attitude. Crespo et al. (2009) provided evidence to support their suggestion and found that perceived risk affects attitude negatively when consumers shop online. According to the existing research, it is reasonable to propose that perceived risk influences attitude negatively.

H7: Perceived risk has a negative effect on attitude.

3.2.8. Perceived Cost and Attitude

Perceived cost is determined by time cost, money cost, and energy cost, which is another important predictor of consumers' attitude (Verhallen & Pieters, 1984). Abdul-Muhmin (2010) focused on online shopping to estimate the relationship between perceived cost and attitude and found that perceived cost influences attitude negatively. Che et al. (2015) also argued that perceived cost affects consumers' attitude toward online group-buying negatively. Accordingly, the hypothesis is proposed as follows:

H8: Perceived cost has a negative effect on attitude.

3.2.9. Attitude and Purchase Intention

The research of the positive relationship between attitude and behavior intention has come a long way since the 1930s (Ajzen, 1991; Fishbein & Ajzen, 2010; Lee & Dai, 2015; Liska, 1984; Wom & Kim, 2020). Many scholars have found that attitude was the most significant predictor of intention. Al-Rafee and Cronan (2006) confirmed that attitude toward digital piracy affects intention. Basha et al. (2015) also cited that attitude has a positive influence on purchase intention. Chen and Tan (2004) studied the effects of attitude on purchase intention positively in technology acceptance. Jayawardhena (2004) found a significant impact of attitude on the purchase intention of online shopping. Given the previous discussion, the hypothesis is proposed as follows:

H9: Attitude has a positive effect on purchase intention.

3.3. Measures

The measures of the constructs in this study refer to the established scales, which are developed in terms of the existing research, using a 7-point Likert scale. Following Steenkamp (1990) and Chung et al. (2006), perceived product quality is measured by 6 items, which are a variety of products, overall quality, freshness, expected quality, brand, and political superiority. Perceived logistics service

quality is measured by 6 items, which are courier's professional level, elastic delivery time, manner of courier, delivery timely, clean package, and convenient return process (Zeithaml, Parasureman, & Malhotra, 2002). Perceived risk is measured by 5 items, which are related to the subjective assessment of the risk when shopping online (Bettman, 1973; Dowling, 1986). The items are an inherent risk, different products, non-delivery, percentage acceptable, and handled risk. Perceived cost is measured by 5 items. These items are constructed based on the research of Wu et al. (2014), which are more cost, perceived higher price paid, more effort for shopping, more time for delivery, and more time searching for information. Attitude is measured by 3 items. These items are the evaluation of products, satisfaction, and reliability (Fishbein & Ajzen, 2010). Purchase intention is measured by 4 items, which are intentions to shop online for fresh agricultural products, be more likely to shop online, the recommendation to others, and shopping online continually (Fishbein & Ajzen, 2010; Zeithaml et al., 1996).

3.4. Data Collection

The preliminary survey of 60 Chinese consumers was conducted on April 28, 2020. According to the results of the pre-test, the questionnaire was revised. By the Chinese online survey website of WenJuanXing, from May 1 to May 10, 2020, a total of 550 questionnaires were distributed to the Chinese consumers randomly, of which 30 were not available and the remaining 520 (94.55%) were used to test the relationships of factors in the research model.

4. Results

4.1. Profile of the Respondents

The demographic characteristics of respondents are described in Table 1. There were 198 (38.1%) males and 322(61.9%) females who participated in the survey. The age distribution was as follows. There were 160 (30.8%) in the group of 18-29 years old, 148 (28.5%) in the group of 30-39 years old, 123 (23.7%) in the group of 40-49 years old, and 89 (17.1%) over 50 years old. Among the 520 respondents, most of them, 255 (49.0%) have studied in the graduate school. Some of them, 235 (45.2%) graduated from universities or colleges. The distribution of the monthly average income was following like this, 5,000-8,000 yuan 172 (33.1%), 8,000 to 10,000 yuan 121 (23.3%), 2,000-5,000 yuan 119 (22.9%).

Table 1: Profile of the Respondents

Variable	Item	Frequency	Percentage
Gender	Male	198	38.1
	Female	322	61.9
Age	18~29 years old	160	30.8
	30~39 years old	148	28.5
	40~49 years old	123	23.7
	Over 50 years old (including 50 years old)	89	17.1
Education	High school or below	30	5.8
	University or college	235	45.2
	Graduate school	255	49.0
Monthly Average Income (RMB)	Less than 2,000 yuan (excluding 2,000 yuan)	27	5.2
	2,000 yuan ~ 5,000 yuan (excluding 5,000 yuan)	119	22.9
	5,000 yuan ~ 8,000 yuan (excluding 8,000 yuan)	172	33.1
	8,000 yuan ~ 10,000 yuan (excluding 10,000 yuan)	121	23.3
	More than 10,000 yuan	81	15.6
Total		520	100

4.2. Factor Analysis and Reliability Analysis

Explore factor analysis is used to extract the variables through a varimax rotation. The results are summarized in Table 2. The value of KMO is 0.896 (Bartlett's test of sphericity = 4009.937, $p < 0.001$), which is above 0.5, indicating that the factor analysis is appreciated (Kaiser, 1974). All the eigen values are above 1, and the factor loadings are greater than 0.5 (excluding items of expected quality, political superiority, delivery timely, and convenient return process), indicating higher convergent validity of the scales (Hair et al., 2006). Furthermore, each Cronbach's alpha of the factors is over 0.5, indicating a high reliability (Nunnally, 1967).

4.3. Hypothesis Test

Three steps of regression analysis are used to test the causal relationships of the proposed hypotheses and the mediation effect of attitude in the fresh agricultural product shopping process (Baron & Kenny, 1986). The first step is to test the causal relationship between the independent and dependent variables with the coefficient *c*. The second step is to test the causal relationship between the independent variable and the mediator with the coefficient *a*. The third step is to test the effects of the independent variable and the mediator on the dependent variable with coefficients *c'* and

b. The results of the coefficient *a*, *b*, *c*, and *c'* are all significant, indicating the mediator works well. The analysis results are shown in Table 3.

In each step, the value of the F statistic is significant ($p < 0.001$), indicating the fitness of the regression model is appropriate. Each R^2 is over the suggested guideline of 0.6, which indicates that more than 60% can be explained through the model.

In the first step, perceived product quality is an important driver of purchase intention ($\beta = 0.242$, $p < 0.001$). H1 is supported. Perceived logistics service quality works as a positive predictor of purchase intention ($\beta =$

Table 2: Results of Factor Analysis and Reliability Analysis

Variable	Item	Eigen Value	Cronbach's Alpha	Factor Loading
Perceived Product Quality	Variety of products	1.177	0.706	0.690
	Overall quality of products			0.607
	Freshness			0.752
	Expected quality			Delete
	Brand			0.692
	Political superiority			Delete
Perceived Logistics Service Quality	Professional courier	1.007	0.661	0.695
	Elastic delivery time			0.663
	Polite courier			0.617
	Delivery timely			Delete
	Clean package			0.547
	Convenient return process			Delete
Perceived Risk	Inherent risk of products	6.553	0.872	0.777
	Different products			0.771
	Non-delivery			0.751
	Percentage acceptable			0.692
	Handled risk			0.736
Perceived Cost	More cost	1.419	0.773	0.793
	Perceived higher price paid			0.666
	More effort for shopping			0.714
	Cost more time for delivering			0.675
	More time searching for information			0.695
Attitude	Evaluation of products	1.543	0.600	0.678
	Satisfaction			0.608
	Confidence			0.595
Purchase Intention	Intention to shop online	2.389	0.773	0.745
	Be more likely to shop online			0.780
	Recommendation to others			0.721
	Shopping online continually			0.840
KMO = 0.896, Bartlette's test of sphericity: 4009.937 ($p < 0.001$).				
Extraction method: Principal component analysis.				

Table 3: Results of Hypothesis Test

Step	Dependent Variable	Independent Variable	Coefficient (β)	t	R ²	F
1	Purchase Intention	Perceived Product Quality	0.273*** (0.242)	5.937	0.770	187.440***
		Perceived Logistics Service Quality	0.560*** (0.477)	11.818		
		Perceived Risk	-0.128*** (-0.142)	-4.042		
		Perceived Cost	-0.077** (-0.062)	-2.023		
2	Attitude	Perceived Product Quality	0.322*** (0.322)	6.749	0.665	101.986***
		Perceived Logistics Service Quality	0.219*** (0.210)	4.449		
		Perceived Risk	-0.224*** (-0.280)	-6.785		
		Perceived Cost	-0.079** (-0.071)	-1.992		
3	Purchase Intention	Perceived Product Quality	0.228*** (0.202)	4.790	0.776	155.200***
		Perceived Logistics Service Quality	0.529*** (0.451)	11.067		
		Perceived Risk	-0.097** (-0.107)	-2.949		
		Perceived Cost	-0.088** (-0.071)	-2.329		
		Attitude	0.141*** (0.125)	3.358		

***p<0.001, **p<0.05

0.477, $p < 0.001$). H2 is supported. In contrast, perceived risk has a negative impact on purchase intention ($\beta = -0.142$, $p < 0.001$). H3 is supported. Perceived cost influences purchase intention negatively ($\beta = -0.062$, $p < 0.05$). H4 is supported. As compared with the standardized coefficient β , perceived logistics service quality is the most important predictor for the Chinese consumers to make a purchase decision.

In the next step, perceived product quality has a positive effect on attitude ($\beta = 0.322$, $p < 0.001$). H5 is supported. Perceived logistics service quality also has a positive effect on attitude ($\beta = 0.210$, $p < 0.001$). H6 is supported. Perceived risk affects attitude negatively ($\beta = -0.280$, $p < 0.001$). H7 is supported. Perceived cost influences attitude negatively ($\beta = -0.071$, $p < 0.05$). H8 is supported.

In the last step, comparing with the guidelines of 0.001 and 0.05, the perceived product quality, perceived logistics service quality, perceived risk, and perceived cost affect purchase intention significantly. Attitude has a positive impact on purchase intention ($\beta = 0.125$, $p < 0.001$). H9 is

supported. Overall, attitude works as a significant mediator in the purchasing process of fresh agricultural products.

5. Conclusions

5.1. Review of the Findings

This research was undertaken to explore the major factors that may influence the Chinese consumption behavior of fresh agricultural products in an Internet environment. With the data collected from the Chinese consumers who have the online shopping experiences of fresh agricultural products, an interesting conclusion is drawn as follows.

Perceived quality, including product quality and logistics service quality, is a significant predictor of consumers' purchasing behavior of fresh agricultural products. These findings are consistent with the results cited by researchers such as Chung et al. (2006) and Gu et

al. (2019). The greater the quality is perceived by consumers, the greater is the attitude toward fresh agricultural products is, and then the greater intention to buy the products through the online retailer.

On the other hand, in line with the studies of Bettman (1973) and Wu et al. (2014), the results of this research make it clear that perceived risk and perceived cost are the negative factors that affect consumers' online shopping decisions of fresh agricultural products. Online shopping provides convenience for consumers to buy what they need. Meanwhile, consumers should take the monetary and non-monetary cost to select products along with the effect of transaction risk.

Moreover, the relationship of attitude-behavior suggested by Fishbein and Ajzen (1975) has been confirmed in this study, which is that attitude influences the intention of fresh agricultural products online shopping positively. In other words, attitude is a critical mediator in the online shopping process of fresh agricultural products.

5.2. Implications

With the findings of this study, some relevant marketing strategies are discussed.

First, managers should enhance the quality of online shopping distributions to compete in the Chinese market for fresh agricultural products. It is because the perceived quality is the import driver of consumers' attitude and intention to purchase fresh agricultural products in the Internet environment. One of the effective methods is to provide fresh and variety of products with a great brand related to the perceived product quality. The other method is to improve the perceived level of logistics service quality. Examples of providing elastic delivery time in a polite manner is a good idea to ensure transportation efficiency, which may be positively related to consumers' purchase intention.

Second, the strategies of risk reduction and cost saving are also attractive methods for marketers to consider. The reason is that the perceived risk and perceived cost affect consumers' attitude and willingness to purchase fresh agricultural products negatively. Therefore, it is necessary to establish a safe and effective supply chain system to reduce the perceived risk and cost. Price reduction is another great idea for managers to implicate in the China market.

Finally, attitude is an important mediator in the online shopping process of fresh agricultural products. Generally, attitude replies on cognitive and affective attitudes. Cognitive attitude refers to what the consumer knows about fresh agricultural products. Affective attitude concerns the extent to which the consumer likes or dislikes the fresh agricultural products. Therefore, managers can design

simple and novel interface layout and interactivity of the online shopping retailer, which may improve consumers' physical and psychological attitude, and then, the consumers' knowledge and preference can enhance their intention toward online shopping of fresh agricultural products.

5.3. Limitations and Future Research

This study contributes to understanding Chinese consumers' behavior toward fresh agricultural products in an Internet environment. However, it has some limitations, which may provide future research directions in this area. First, China is a great country with about 1.4 billion people. Thus, the findings of this study are difficult to be generalized. Future studies should be conducted with data from more Chinese respondents respectively. Second, this research concerns the main attributes of fresh agricultural products to investigate Chinese consumers' online shopping behavior. The online retailer characteristics in response to the store personality may be also critical factors influencing consumers' decisions. Therefore, future studies should consider wider factors to estimate consumers' behavior, which may be meaningful for the development of this industry.

References

- Abdul-Muhmin, A. G. (2010). Repeat purchase intentions in online shopping: The role of satisfaction, attitude, and online retailers' performance. *Journal of International Consumer Marketing*, 23(1), 5-20. <https://doi.org/10.1080/08961530.2011.524571>
- Ahumada, O., Villalobos, J. R., & Mason, A. N. (2012). Tactical planning of the production and distribution of fresh agricultural products under uncertainty. *Agricultural Systems*, 112, 17-26. <https://doi.org/10.1016/j.agsy.2012.06.002>
- Ajzen, I. (1991). The theory of planned behavior. *Organizational Behavior and Human Decision Process*, 50(2), 179-211. [https://doi.org/10.1016/0749-5978\(91\)90020-T](https://doi.org/10.1016/0749-5978(91)90020-T)
- Ajzen, I., & Fishbein, M. (1980). *Understanding attitudes and predicting social behavior*. New Jersey: Prentice-Hall.
- Al-Rafee, S., & Cronan, T. P. (2006). Digital piracy: Factors that influence attitude toward behavior. *Journal of Business Ethics*, 63(3), 237-259. <https://doi.org/10.1007/s10551-005-1902-9>
- Amchang, C., & Song, S-H. (2018). Designing a distribution network for faster delivery of online retailing: A case study in Bangkok, Thailand. *International Journal of Industrial Distribution & Business*, 9(5), 25-35.
- Anwar, A., Thongpapanl, N., & Ashraf, A. R. (2020). Strategic imperatives of mobile commerce in developing countries: the influence of consumer innovativeness, ubiquity, perceived value, risk, and cost on usage. *Journal of Strategic Marketing*, 1-21. <https://doi.org/10.1080/0965254X.2020.1786847>

- Ariffin, S. K., Mohan, T., & Goh, Y. N. (2018). Influence of consumers' perceived risk on consumers' online purchase intention. *Journal of Research in Interactive Marketing, 12*(3), 309-327. <https://doi.org/10.1108/JRIM-11-2017-0100/full/html>
- Baron, R. M., & Kenny, D. A. (1986). The moderator-mediator variable distinction in social psychological research: Conceptual, strategic, and statistical considerations. *Journal of Personality and Social Psychology, 51*(6), 1173-1182. <https://doi.org/10.1037//0022-3514.51.6.1173>
- Basha, M. B., Mason, C., Shamsudin, M. F., Hussain, H. I., & Salem M. A. (2015). Consumers' attitudes towards organic food. *Procedia Economics and Finance, 31*, 444-452. [https://doi.org/10.1016/S2212-5671\(15\)01219-8](https://doi.org/10.1016/S2212-5671(15)01219-8)
- Bauer, R. A. (1960). Consumer behavior as risk-taking. In R. S. Hancock (Ed.), *Dynamic Marketing for a Changing World*. Chicago: American Marketing Association.
- Bettman, J. R. (1973). Perceived risk and its components: A model and empirical test. *Journal of Marketing Research, 10*(2), 184-190. <https://www.jstor.org/stable/3149824>
- Che, T., Peng, Z., Lim, K. H., & Hua, Z. (2015). Antecedents of consumers' intention to revisit an online group-buying website: A transaction cost perspective. *Information & Management, 52*(5), 588-598. <https://doi.org/10.1016/j.im.2015.04.004>
- Chen, L. D., & Tan, J. (2004). Technology adaptation in E-commerce: Key determinants of virtual stores acceptance. *European Management Journal, 22*(1), 74-86.
- Chung, J. E., Yu, J. P., & Pysarchik, D. T. (2006). Cue utilization to assess food product quality: A comparison of consumers and retailers in India. *International Review of Retail, Distribution and Consumer Research, 16*(2), 199-214. <https://doi.org/10.1080/09593960600572233>
- Chung, J. H., & Huang, S. H. (2016). A study on the effects of selection attributes for agricultural products on using local food store. *Journal of Distribution Science, 14*(4), 117-125. <https://doi.org/10.15722/jds.14.4.201604.117>
- CNNIC. (2020). *The 45th Statistical Report on Internet Development in China*. Online information, retrieved 16/07/2020, https://tech.sina.com.cn/zt_d/cnnic45/.
- Cox, D. F., & Rich, S. U. (1964). Perceived risk and consumer decision-making: The case of telephone shopping. *Journal of Marketing Research, 1*(4), 32-39. <https://doi.org/10.22495/rgcv4i4c1art4>
- Crespo, A. H., del Bosque, I. R., & Sanchez, M. M. G. de los S. (2009). The influence of perceived risk on Internet shopping behavior: A multidimensional perspective. *Journal of Risk Research, 12*(2), 259-277. <https://doi.org/10.1080/13669870802497744>
- Crosby, P. B. (1979). *Quality is free: The art of making quality certain*. In A. Parasuraman, V. A. Zeithaml, & L. L. Berry (eds), A conceptual model of service quality and its implications for future research. *Journal of Marketing, 49*(4), 41-50. <http://www.jstor.org/stable/1251430>
- Dai, W., & Lee, J-H. (2018). Effects of website characteristics and delivery service quality on repurchase intention. *International Journal of Industrial Distribution & Business, 9*(5), 17-24. <http://dx.doi.org/10.13106/ijidb.2018.vol9.no5.17>
- Dodds, W. B., Monroe, K. B., & Grewal, D. (1991). Effects of price, brand, and store information on buyers' product evaluations. *Journal of Marketing Research, 28*(3), 307-319. <https://www.jstor.org/stable/3172866>
- Dowling, G. R. (1986). Perceived risk: The concept and its measurement. *Psychology & Marketing, 3*(3), 193-210. <https://doi.org/10.1002/mar.4220030307>
- Eiser, J. R., Miles, S., & Frewer, L. J. (2002). Trust, perceived risk, and attitude toward food technologies. *Journal of Applied Social Psychology, 32*(11), 2423-2433. <https://doi.org/10.1111/j.1559-1816.2002.tb01871.x>
- Featherman, M. S., & Pavlou, P. A. (2003). Predicting e-services adoption: A perceived risk facets perspective. *International Journal of Human-Computer Studies, 59*(4), 451-474. [https://doi.org/10.1016/S1071-5819\(03\)00111-3](https://doi.org/10.1016/S1071-5819(03)00111-3)
- Fishbein, M., & Ajzen, I. (1975). *Belief, attitude, intention, and behavior: An introduction to theory and research*. Reading, MA: Addison-Wesley. In B. Hasan (2010). Exploring gender differences in online shopping attitude. *Computers in Human Behavior, 26*(4), 597-601. <https://doi.org/10.1016/j.chb.2009.12.012>
- Fishbein, M., & Ajzen, I. (2010). *Predicting and changing behavior: The reasoned action approach*. New York: Psychology Press.
- Forsythe, S. M., & Shi, B. (2003). Consumer patronage and risk perceptions in Internet shopping. *Journal of Business Research, 56*(11), 867-875. [https://doi.org/10.1016/S0148-2963\(01\)00273-9](https://doi.org/10.1016/S0148-2963(01)00273-9)
- Gao, Z., Kim, H. H., & Sim, J. (2020). Research on influencing factors of consumer behavior of fresh agricultural products E-commerce in China. *Journal of Digital Convergence, 18*(6), 167-175. <https://doi.org/10.14400/JDC.2020.18.6.167>
- Gu, W., Bao, P., & Lee, J. H. (2019). A study on the continuance intention of O2O fresh agricultural products E-commerce. *International Journal of Industrial Distribution & Business, 10*(10), 35-44. <https://doi.org/10.131016/ijidb.2019.vol10.no10.35>
- Hair, J. F., Jr., Black, W. C., Babin, B. J., Anderson, R. E., & Tatham, R. L. (2006). *Multivariate Data Analysis*. Upper Saddle River, New Jersey: Pearson Education.
- Hasan, B. (2010). Exploring gender differences in online shopping attitude. *Computers in Human Behavior, 26*(4), 597-601. <https://doi.org/10.1016/j.chb.2009.12.012>
- iResearch. (2020). *Report on Fresh E-commerce Industry in China*. Online information, retrieved 16/07/2020, http://report.iresearch.cn/report_pdf.aspx?id=3620.
- Jayawardhena, C. (2004). Personal values' influence on e-shopping attitude and behavior. *Internet Research, 14*(2), 127-138.
- Kaiser, H. F. (1974). An index of factorial simplicity. *Psychometrika, 39*(1), 31-36. <https://doi.org/10.1108/10662240410530844>
- Kesharwani, A., & Bisht, S. S. (2011). The impact of trust and perceived risk on internet banking adoption in India: An extension of technology acceptance model. *International Journal of Bank Marketing, 30*(4), 303-322. <https://doi.org/10.1108/02652321211236923>
- Kim, J., & Lennon, S. J. (2013). Effects of reputation and website quality on online consumers' emotion, perceived risk and purchase intention. *Journal of Research in Interactive Marketing, 7*(1), 33-56. <https://doi.org/10.1108/17505931311316734>

- Kim, P. J., Kim, M. S., Kim, W., Mehyaoui, O., & Youn, M. K. (2014). Effects on the consumer buying behavior of an agricultural brand in South Korea. *International Journal of Industrial Distribution & Business*, 5(2), 21-28.
- Kim, P. J., & Lee, J.Y. (2016). A study on the effects of perceived quality on whitening cosmetics' satisfaction and repurchase: Focused on university students. *East Asian Journal of Business Management*, 6(2), 15-22. <https://doi.org/10.13106/eajbm.2016.vol6.no2.15>.
- Kuo, Y-F., Wu, C-M., & Deng, W-J. (2009). The relationships among service quality, perceived value, customer satisfaction, and post-purchase intention in mobile value-added service. *Computer in Human Behavior*, 25(4), 887-896.
- Lee, K. K., Ahn, S-H., Kim, H. D., & Youn, M. K. (2014). Effects of the flow of an Internet shopping mall upon revisit intention and purchase intention. *East Asian Journal of Business Management*, 4(4), 27-38.
- Lee, M. C. (2009). Factors influencing the adoption of internet banking: An integration of TAM and TPB with perceived risk and perceived benefit. *Electronic Commerce Research and Applications*, 8(3), 130-141. <https://doi.org/10.1016/j.elerap.2008.11.006>
- Lee, S-J., & Dai, J. (2015). Use intentions of mobile tour Apps through expansion of the Technology Acceptance Model. *Journal of Distribution Science*, 13(10), 135-142.
- Liska, A. E. (1984). A critical examination of the causal structure of the Fishbein/Ajzen attitude-behavior model. *Social Psychology Quarterly*, 47(1), 61-74. <https://doi.org/10.2307/3033889>
- Liu, J., & Ke, X. (2012). Improvement in logistics of fresh agricultural products. *Journal of System and Management Sciences*, 2(2), 36-45.
- Nguyen, O. T. (2020). Factors affecting the intention to use digital banking in Vietnam. *Journal of Asian Finance, Economics and Business*, 7(3), 303-310.
- Nunnally, J. C. (1967). *Psychometric theory*. In Gilbert A. Churchill, Jr. (1979). A paradigm for developing better measures of marketing constructs. *Journal of Marketing Research*, 16(1), 64-73. <https://www.jstor.org/stable/3150876>
- Parasuraman, A., Zeithaml, V. A., & Berry, L. L. (1985). A conceptual model of service quality and its implications for future research. *Journal of Marketing*, 49(4), 41-50. <https://doi.org/10.2307/1251430>
- Parasuraman, A., Zeithaml, V. A., & Berry, L. L. (1988). SERVQUAL: A multiple-item scale for measuring consumer perceptions of service quality. *Journal of Retailing*, 64(1), 12-40.
- Park, J., Lennon, S. J., & Stoel, L. (2005). On-line product presentation: Effects on mood, perceived risk, and purchase intention. *Psychology & Marketing*, 22(9), 695-719. <https://doi.org/10.1002/mar.20080>
- Petty, R. E., Wegener, D. T., & Fabrigar, L. R. (1997). Attitudes and attitude change. *Annual Review Psychology*, 48(1), 609-647. <https://doi.org/10.1146/annurev.psych.48.1.609>
- Rong, A., Akkerman, R., & Grunow, M. (2011). An optimization approach for managing fresh food quality throughout the supply chain. *International Journal of Production Economics*, 131(1), 421-429. <https://EconPapers.repec.org/RePEc:eee:proeco:v:131:y:2011:i:1:p:421-429>
- Rosillo-Diaz, E., Blanco-Encomienda, F. J., & Crespo-Almendros, E. (2019). A cross-cultural analysis of perceived product quality, perceived risk and purchase intention in e-commerce platforms. *Journal of Enterprise Information Management*, 33(1), 139-160. <https://doi.org/10.1108/JEIM-06-2019-0150>
- Steenkamp, J. B. E. M. (1990). Conceptual model of the quality perception process. *Journal of Business Research*, 21(4), 309-333. <https://EconPapers.repec.org/RePEc:eee:jbre:v:21:y:1990:i:4:p:309-333>
- Tham, K. W., Dastane, O., Johari, Z., & Ismail, N. B. (2019). Perceived risk factors affecting consumers' online shopping behaviour. *Journal of Asian Finance, Economics and Business*, 6(4), 249-260. <https://doi.org/10.13106/jafeb.2019.vol6.no4.249>
- Tran, V. D. (2020). The relationship among product risk, perceived satisfaction and purchase intentions for online shopping. *Journal of Asian Finance, Economics and Business*, 7(6), 221-231. <https://doi.org/10.13106/jafeb.2020.vol7.no6.221>
- Truong, T. H., & Nguyen, X. T. (2020). Factors affecting organic food purchasing decisions of kindergartens in Ho Chi Minh City. *Journal of Distribution Science*, 18(7), 73-81. <https://doi.org/10.15722/jds.18.7.202007.73>
- Tsiotsou, R. (2006). The role of perceived product quality and overall satisfaction on purchase intention. *International Journal of Consumer Studies*, 30(2), 207-217. <https://doi.org/10.1111/j.1470-6431.2005.00477.x>
- Verhallen, T. M. M., & Pieters, R. G. M. (1984). Attitude theory and behavioral costs. *Journal of Economic Psychology*, 5(3), 223-249. [https://doi.org/10.1016/01674870\(84\)90024-2](https://doi.org/10.1016/01674870(84)90024-2)
- Wang, E. S. T. (2013). The influence of visual packaging design on perceived food product quality, value, and brand preference. *International Journal of Retail & Distribution Management*, 41(10), 805-816. <https://doi.org/10.1108/IJRDM-12-2012-0113>
- Wells, J. D., Valacich, J. S., & Hess, T. J. (2011). What signal are you sending? How website quality influences perceptions of product quality and purchase intentions. *MIS Quarterly*, 35(2), 373-396. <https://doi.org/10.2307/23044048>
- Widodo, K. H., Nagasawa, H., Morizawa, K., & Ota, M. (2006). A periodical flowering-harvesting model for delivering agricultural fresh products. *European Journal of Operational Research*, 170(1), 24-43. <https://doi.org/10.1016/j.ejor.2004.05.024>
- Won, J., & Kim, B-Y. (2020). The effect of consumer motivations on purchase intention of online fashion-sharing platform. *Journal of Asian Finance, Economics and Business*, 7(6), 197-207. <https://doi.org/10.13106/jafeb.2020.vol7.no6.197>
- Wu, L. Y., Chen, K. Y., Chen, P. Y., & Cheng, S. L. (2014). Perceived value, transaction cost, and repurchase-intention in online shopping: A relational exchange perspective. *Journal of Business Research*, 67(1), 2768-2776. <https://doi.org/10.1016/j.jbusres.2012.09.007>
- Wu, S. I. (2003). The relationship between consumer characteristics and attitude toward online shopping. *Marketing Intelligence & Planning*, 21(1), 37-44. <https://doi.org/10.1108/112634500310458135J0>

- Yan, B., Chen, X., Cai, C., & Guan, S. (2020). Supply chain coordination of fresh agricultural products based on consumer behavior. *Computers and Operation Research*, 123, 1-9.
- Zeithaml, V. A. (1988). Consumer perceptions of price, quality, and value: A means-end model and synthesis of evidence. *Journal of marketing*, 52(3), 2-22. <https://doi.org/10.1177/002224298805200302>
- Zeithaml, V. A., Berry, L. L., & Parasuraman, A. (1996). The behavioral consequences of service quality. *Journal of Marketing*, 60(2), 31-46. <https://doi.org/10.1177/002224299606000203>
- Zeithaml, V. A., Parasuraman, A., & Malhotra, A. (2002). Service quality delivery through web sites: A critical review of extant knowledge. *Journal of the Academy of Marketing Science*, 30(4), 362-375. <https://doi.org/10.1177/009207002236911>