

Full Length Research Paper

Farmers' information acceptance behavior in China

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This study attempts to provide insights into farmers' information acceptance behavior in China. The paper proposes an integrated model based on the technology acceptance model (TAM). Correlation and regression analyses are used to investigate the determinants. The results show that income, attitude, risk preference, perceived usefulness, searching motivation and experience affect farmers' agricultural information acceptance directly.

Key words: Acceptance, technology acceptance model, perceived usefulness, perceived ease of use, perceived risk.

INTRODUCTION

Information has played a significant role in agricultural development recent years. Farmers are supplied with a considerable variety of agricultural information in China. However, the proportion of the information that farmers make full use of is small. How to shorten the distance between agricultural information supply and acceptance is a main concern. It is significant to explain and predict farmers' acceptance of agricultural information.

Prior researches are mainly focused on the variety of information that farmers cared about most and the efficient ways of information transferring by the qualitative analysis. Few are carried out from the point of view of the cognitive approach to investigate the acceptance. This article aims to enhance our current understanding about farmers' agricultural information acceptance with the entry point of consumer mentality.

Technology acceptance model (TAM) (Davis et al., 1989) is selected as the main theoretical method. TAM, which was originally developed by Davis, has the advantage of being well grounded established social psychology theory (McKechnie et al., 2006). The model frame is made up of two main aspects, which are perceived usefulness and perceived ease of use. The former refers to the users' perception of the degree to which using a system will enhance their performance, and the latter means the degree to which users consider the system to be free of effort (Davis et al., 1989).

Besides, perceived usefulness and perceived ease of use will affect actual system usage through attitude and intention. Attitude, which is the key determinant of behavioral intention has a direct effect on intention. It is determined by both users' perception of usefulness and ease of use, and the actual use is directly determined by behavioral intention. In previous researches, it was found that usefulness may impact actual use irrespective of attitude, provided that the use of the system offers direct benefits to the user (Davis et al., 1989; McKechnie et al., 2006). When a system is considered to be easy to master, the perception of the usefulness will be reinforced. Therefore, perceived ease of use may have a direct influence on perceived usefulness.

MATERIALS AND METHODS

Survey and sampling areas

A skeleton questionnaire is designed to guide the structured interviews with agricultural information acceptance of farmers. The items in the questionnaires are measured on a 5-point Likert-type scale (1 = strongly disagree to 5 = strongly agree). Data in the study are collected with a sample of two hundred and thirty-one farmers from thirteen different areas in China.

Conceptual framework

Modifications are made to the original technology acceptance model and several hypotheses are put forward. The model of farmers' agricultural information acceptance is shown as Figure 1.

According to the TAM, perceived usefulness and perceived ease

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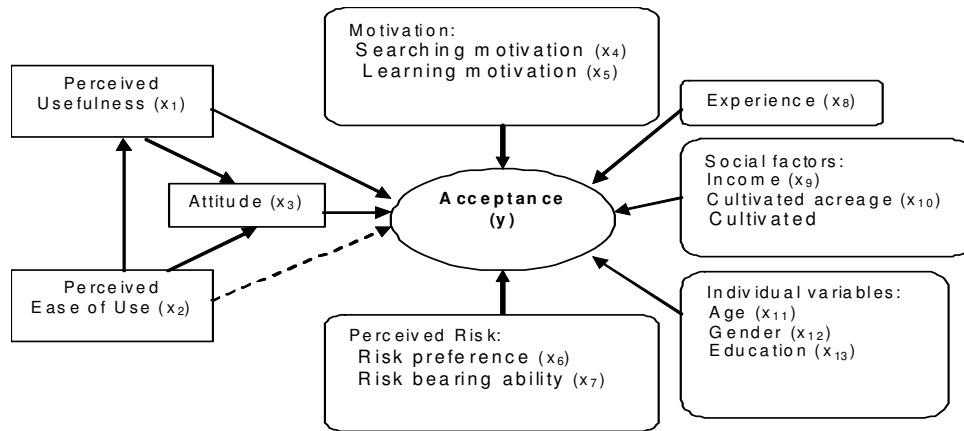


Figure 1. The model of farmers' information acceptance.

of use are two important determinants. It is supposed that perceived usefulness and perceived ease of use both affect farmers' farmers' attitude directly. Furthermore, it is proposed that perceived ease of use not only predicts attitude, but is also an antecedent of perceived usefulness (Davis et al., 1989). Therefore, farmers' confidence in information might be increased if it is easy to obtain and master the information. The hypotheses are proposed as follows:

H1: Farmers' perceived usefulness influences the attitude towards using information positively.

H2: Farmers' perceived ease of use influences the attitude towards using information positively.

H3: Farmers perceived ease of use influences perceived usefulness positively.

Farmers' attitude towards agricultural information might impact the acceptance directly. Similarly, it is assumed that perceived usefulness would affect decision of accepting information without the medium of attitude (Davis et al., 1989).

H4: Farmers' perceived usefulness affects the information acceptance positively.

H5: Farmers' attitude affects the information acceptance positively.

Experience: Previous studies suggested that experience with the technology was a paramount factor and would result in the higher degree of the adoption (McKechnie et al., 2006). It is argued that farmers who have the experience in using information might have a possibility of acceptance.

H6: Experience may impact farmers' agricultural information acceptance positively.

Motivation: Earlier researches found that intensive motivation would act on the acceptance (Lee et al., 2005). We argue that farmers who exhibit the higher level of information searching and learning motivation would be more interested in agricultural information than those who exhibit the lower level. **H7:** Farmers' information searching motivation is related to the acceptance positively.

H8: Farmers' information learning motivation is related to the acceptance positively.

Perceived risk: According to consumer behavior theory, perceived risk plays an important part in consumers' decisions. The risk that people consider subjectively may not be the real one. When deciding whether to accept information or not, farmers' perceived risk is crucial. Farmers' making decisions is also a course of mitigating the perceived risk to the acceptable level. Therefore, perceived risk of agricultural information acceptance is added to the original model in this study and it is defined as risk preference and the risk bearing ability. It is supposed that perceived risk and risk bearing ability would have influences on the acceptance.

H9: Farmers' risk preference is related to the acceptance directly.

H10: Farmers' risk bearing ability is related to the acceptance directly.

Individual and social variables: The impact of information is recessive and indirect, both of which determine the discrepant outcomes when accepted by kinds of profiles of users. For example, it may be easier for farmers with the higher education to catch on the deeply signification of information. Similarly, those who are taking on the larger plough land may be more willing to accept information, because the bigger the acreage is, the more obvious the effect of the agricultural information may be. In this model, age, gender, education, income and plough land acreage are included as individual and social variables.

Statistic methods

The analyses are divided into two parts. Firstly, relevance between the components of the original model is tested by the correlation analysis. Secondly, the regression analysis is used to investigate the determinants of farmers' agricultural information acceptance.

There are only two results of farmers' information acceptance, which are yes or not. Because of the binary dependent variable, binary logistic regression is conducted in this study. In the binary logistic regression analysis, $Y = 1$ means farmers will accept the information and p is substituted for y as the dependent variable. P is the probability when the dependent is 1.

(b1...bk) are the coefficients of the independent variables.

$$P(Y) = \begin{cases} 1 & P \\ 0 & 1 - p \end{cases} \tag{1}$$

$$p = \frac{e^{b_0 + b_1x_1 + \dots + b_kx_k}}{1 + e^{b_0 + b_1x_1 + \dots + b_kx_k}} \quad (2)$$

In the binary logistic regression function of farmers' agricultural information acceptance, perceived usefulness (x1), perceived ease of use (x2), attitude (x3), motivation (x4-x5), perceived risk (x6-x7), experience (x8), socio factors (x9-x10), individual characteristics (x11-x13) are defined as independent variables. The logistic function is presented as (3).

$$\text{Logit}(p) = \ln\left(\frac{p}{1-p}\right) = b_0 + b_1x_1 + \dots + b_{13}x_{13}$$

RESULTS AND DISCUSSION

Characteristics of the sample

A total of 316 questionnaires are returned. After eliminating those questionnaires with incomplete responses and those that are otherwise unusable, 231 questionnaires are remained with an effective response rate of 73%. The questionnaire has past the reliability and validity testing.

In the effective samples, almost all of the farmers are culturists and planters. The whole education level of respondents is comparatively low, and nearly half are junior middle school. The results are presented in Table 1.

Correlation analysis

TAM has shown a sound applicability in this research. Farmers' perceived usefulness of information directly affects the information acceptance with a correlation coefficient of .501. Perceived ease of use exhibits a positive relationship on perceived usefulness (.381), which means if farmers consider it is easy to master and get the information, the acceptance willingness is intensive. Besides, there exists a relationship between information acceptance and perceived usefulness via attitude, either is perceived ease of use. Farmers' attitude towards agricultural information influences the acceptance significantly, with a correlation coefficient of .670. Results are shown as Figure 2.

Binary logistic regression analysis

After 6 steps of the backward stepwise procedure, the significant determinants are given in Table 2. Experience is directly associated with the acceptance and the regression coefficient is .661. Usually, if farmers have contacted with information and received some helps, they are willing to accept agricultural information once again. The higher the frequency is, the bigger the possibility is.

Table 1. Characteristics of the sample.

Categories	Number	Percentage %
Gender		
Male	161	69.7
Female	70	30.3
Age group		
From 18-30	44	19.0
From 31-40	77	33.3
From 41-50	69	29.9
From 51-60	34	14.7
Over 60	7	3.03
Education level		
None	22	9.52
Primary education	50	21.6
Secondary education	105	45.5
Higher education	42	18.2
Over	12	5.19

explained that experience reduces the difficulty to master information, which in turn enhances farmers' confidence in information searching motivation and learning motivation are two components of farmers' information usage motivation in this study.

It is shown that searching motivation has a significant impact on the information acceptance (.576). Sometimes, farmers are willing to search information voluntarily, but they do not know how to carry out. The outcome indicates that it is more likely to accept the agricultural information for farmers who have the stronger information searching motivation.

Turning to the perceived risk, the result yields the evidence that risk preference influences farmers' agricultural information acceptance positively. The farmers who tend to avoid doing something adventure might be less interested in agricultural information.

As for the social and individual variables, only income has shown a regression relationship with the acceptance (.259), but not so strongly as we have forecast before.

In terms of the original components of the TAM, perceived usefulness and attitude influences farmers' agricultural information acceptance intensively.

Risk bearing ability, perceived ease of use, learning motivation, cultivated acreage, age, gender and education do not show the evident impact as predicted before. It could be explained that risk bearing ability might act on the information acceptance of farmers via income indirectly. Perceived ease of use affects the acceptance via attitude and perceived usefulness, which might also lead to the weak effect of perceived ease of use and learning motivation. Farmers in this study are almost culturists and planters, and the education level is middle school on the whole. The similarity of the sample

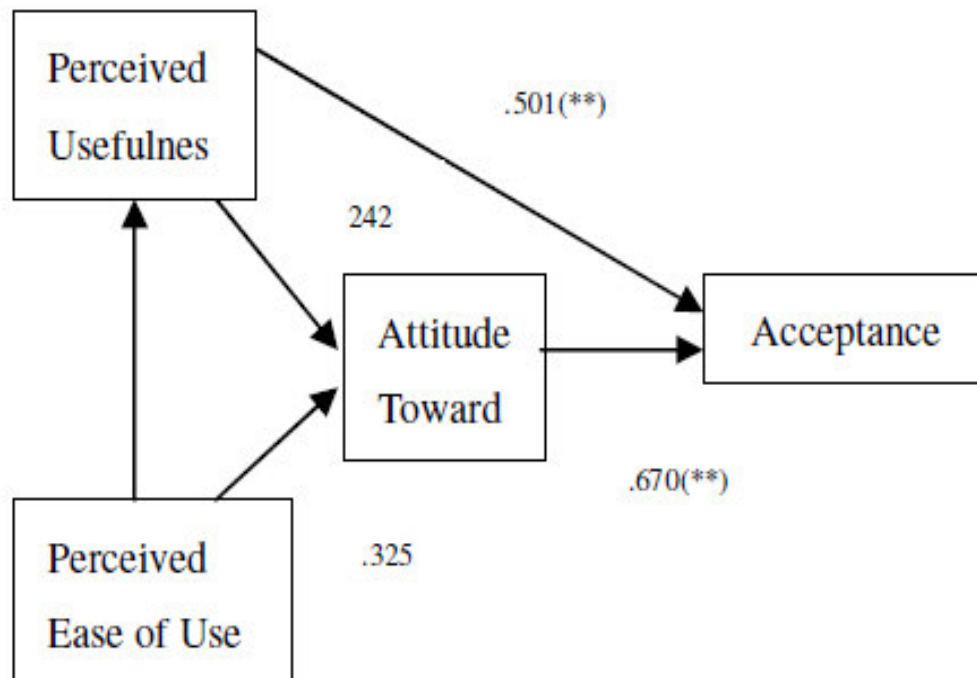


Figure 2. The correlation coefficients of the model.

Table 2. Results of the binary logistic regression.

	B	S.E.	Wald	df	Sig.	Exp(B)
Income	.259	.114	5.193	1	.023	1.296
Risk preference	.309	.290	4.323	1	.018	1.362
Step 6 Attitude	.397	.199	3.993	1	.016	1.487
Perceived Usefulness	.423	.196	4.613	1	.007	1.527
Searching motivation	.576	.099	8.431	1	.004	1.780
Experience	.661	.049	12.546	1	.002	1.937
Constant	-3.102	.813	14.551	1	.000	.045

might be the cause of insignificance of the social and individual variables. So, the regression model is:

$$\begin{aligned}
 \text{Logit}(p) = & -3.102 + 0.259x_9 + 0.309x_6 + 0.397x_3 \\
 & + 0.423x_1 + 0.576x_4 + 0.661x_8
 \end{aligned}
 \tag{4}$$

CONCLUSION AND SUGGESTIONS

Agricultural information has manifested its importance gradually. The objective of the study is to investigate farmers’ acceptance of agricultural information in China.

Farmers’ agricultural information acceptance regression function is gained by the binary logistic regression. The results show that farmers’ attitude and perceived usefulness both have the intensive correlativity with the acceptance directly. The determinants of farmers’ agricul-

tural information acceptance are mainly experience, searching motivation, perceived usefulness, risk preference, attitude and income.

Generally, it is concluded that farmers in China have realized the usefulness of agricultural information. But there are still a lot of problems in the agricultural information diffusing. Based on the study, some suggestions are put forth here:

Varying the categories of information

In order to make the agricultural information more workable, different kinds of farmers could be supplied with the varied information. Taking risk preference for example, on the one hand, farmers who always avoid doing something venturesome may be interested in market information and product information, on the other

hand, the ones who are likely to try something new may also show the interest in the advanced technology information or investment information.

Making the channels of information transmission convenient for farmers

Although having learnt about the importance of agricultural information gradually, most farmers are short of the ability to search for information effectively. To simplify the information transmission methods may lead to information more reachable.

Paying attention to farmers who have the experience in information usage

The research shows that farmers are likely to accept agricultural information if they have the similar experience before, moreover, their confidence and behaviors will influence others with no experience positively.

In a word, many factors have influences on farmers' agricultural information acceptance and may vary as time goes by. Future research could be focused on the dynamic research of the decisions in order to know deeply about farmers' agricultural information acceptance.

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