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Research on User Adoption Behavior of Internet Financing Products: Empirical Analysis Based on Structural Equation Model

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ABSTRACT

From the perspective of empirical research, this paper studies the influencing factors of family investors' adoption of Internet financial products. On the basis of Technology Acceptance Model and Planned Behavior Theory, this study introduces family lifecycle as a moderating variable, and proposes a financial product adoption infulence model composed of 7 variables. The reliability and validity of the scale tool is tested by exploratory factor analysis and Cronbach alpha coefficient respectively. Finally, according to the questionnaire data of 373 family investors, the hypothesis of the influence model is tested by using Structural Equation Model. With every unit of increase in group norms or behavioral attitude, the behavioral attitude will increase 0.465 or 0.457 unit respectively, which demonstrates that its behavioral intention is directly under significantly positive effect from group norms and behavioral attitude. Group norms plays a tremendously crucial role in the product's influence factors and is under the influence of the adjustment of family lifecycle. Behavioral attitude's influence factors are under the direct influence of group norms, perceived ease of use and perceived usefulness from the top to the bottom. Perceived ease of use acts on the process of behavioral attitude, and exerts indirect influence on behavioral attitude through the intermediate of perceived usefulness. This study turns the research perspective from personal financing management to family financing management. Also, the study provides a theoretical basis for the design of Internet currency-oriented financing products for family investors.

Keywords: Family lifecycle, Internet financing product, Influence model, Structural Equation Model.

1. INTRODUCTION

Internet currency-oriented financing products represented by Alibaba's Yu E Bao have yielded prosperous development in China. It is suggested by the 41st Statistical Report on Internet Development in China released by China Internet Network Information Center (CNNIC) that the number of Chinese netizens who have purchased Internet financing products in 2017 has reached 129 million, and the pattern of financial management of the whole society has been transferring to the Internet at an increasing speed. Internet currency-oriented financing products are monetary fund products based on the cooperation between Internet enterprises and fund corporations or Internet-based promotion by fund corporations, and monetary fund products that are sold on a commission basis through traditional channels or banking websites are excluded here.

From the perspective of the influence factors of Internet-based financing products, it is believed by Xing et.al. that users' performance expectation, social influence and economic value have apparent effect on investment's behavioral intention, users expect to indirectly act on investment's behavioral intention through the intermediate of performance expectation, while investment's behavioral intention exerts significant influence on its investment behaviour [1]. Through the verification with a structural equation model, Qiu et.al. found that self-efficacy, perceived ease of use and perceived usefulness are the crucial factors influencing investments' selection of Internet-based financial management products [2]. Han and Chen found that the primary factor of users' behavior of use is perceived risk, and meanwhile, network externality and perceived usefulness also exert significantly positive influence on behavior of use, and network externality exerts significantly positive influence on users' perceived usefulness and perceived ease of use [3]. Through the introduction of the variable of multidimensional risk perception and the theory of trust, Zhang and Li found that perceived ease of use doesn't exert significant influence on clients' willingness to use Yu E Bao, and perceived usefulness and trust are the determinants of clients' selection of Yu E Bao that could exert positive influence, while perceived risk demonstrates a significantly negative relation with investors' willingness to purchase [4]. Luo and Zhu also found that expected revenue, perceived usefulness, perceived ease of use, perceived behavioral control and subjective norm play a positive role in the willingness to use Yu E Bao, while such risk factors as security, economy and time exert negative influence on users' willingness to use [5].

From the perspective of the influence of family lifecycle on investment, Li, Chai and Wang found in the study of the influence of lifecycle and demographic structure on residents' investment portfolio through the data released by China Household Finance Survey (CHFS) that family lifecycle exerts inverted U-shaped influence on the

probability and proportion of risk assets, such as household investment stock and fund, but doesn't demonstrate any significant lifecycle effect on the investment in low-risk bond products [6]. Through the establishment of a decision-making model of family lifecycle investment and consumption combination, Liu and Fan found that the coefficient of risk aversion influences family's decision-making in investment, and further influences family's consumption level, and the increase in the cost of birth-giving and child-fostering will raise the level of family education deposit [7].

In general, the study on the influence on Internet currency-oriented financing products under the perspective of family still needs to be further intensified. In this study, an attempt is made to establish the theoretical model and hypotheses of influence factors of household investment in Internet currency-oriented financing products, and a structural equation model is adopted to verify this model.

2. MODEL AND HYPOTHESIS

In accordance with the technology acceptance model, and the theory of planned behavior and family lifecycle, six latent variables, namely, perceived ease of use (PE), perceived usefulness (PU), perceived risk (PR), group norms (GN), behavioral attitude (BA) and behavioral intention (BI), are brought to the study model. Furthermore, family lifecycle (FL) is considered as the regulated variable, through which, a hypothesis model shown in Figure 1 below is established.
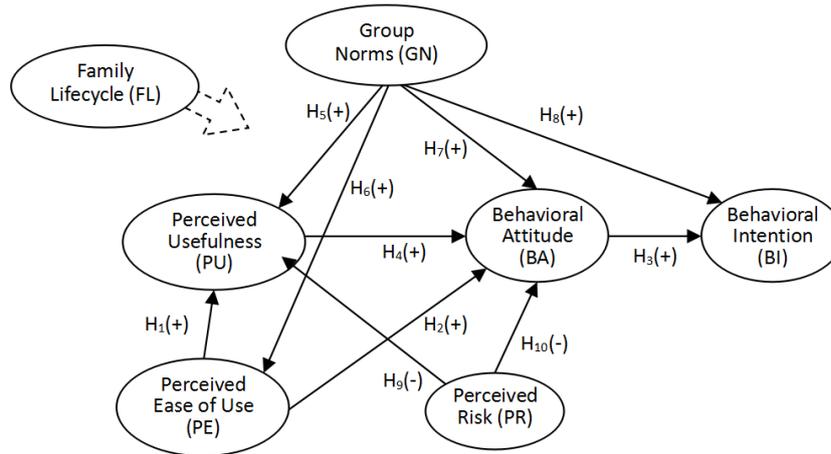

Figure 1 Hypothesis Model of Influence Factors of Internet Currency-oriented Financing Products

Perceived ease of use refers to household investors' ease of utilizing Internet currency-oriented financing products. Please see the hypotheses below:

H_1: perceived ease of use demonstrates positive effect on users' perceived ease of using Internet currency-oriented financing products.

H_2: perceived ease of use demonstrates positive effect on users' behavioral attitude of using Internet currency-oriented financing products.

Behavioral attitude refers to the negative or positive feeling that household investors hold while using Internet currency-oriented financing products. Behavioral intention refers to actions that individuals expect or plan to adopt in the future, and individuals' subjective probability of accepting or engaging in a certain behavior. Please see the hypotheses below:

H_3: behavioral attitude demonstrates positive effect on users' behavioral intention of using Internet currency-oriented financing products.

Perceived usefulness is the degree that reflects an individual's perceived improvement through the application of a specific system. Please see the hypotheses below:

H_4: perceived usefulness demonstrates positive effect on users' behavioral attitude of using Internet currency-oriented financing products.

Group norms refers to the degree of being influenced by other individuals and groups in the selection of Internet currency-oriented financing products. Please see the hypotheses below:

H_5: group norms demonstrates positive effect on users' perceived usefulness of using Internet currency-oriented financing products.

H_6: group norms demonstrates positive effect on users' perceived ease of using Internet currency-oriented financing products.

H_7: group norms demonstrates positive effect on users' behavioral attitude of using Internet currency-oriented financing products.

H_8: group norms demonstrates positive effect on users' behavioral intention of using Internet currency-oriented financing products.

Perceived risk refers to users' psychological feeling and subjective cognizance of the various possible losses while purchasing a commodity. It can be divided into six dimensionalities, namely, financial analysis, performance risk, physical risk, psychological risk, social risk and time risk [8]. Please see the hypotheses below:

H_9: perceived risk demonstrates negative effect on users' perceived usefulness of using Internet currency-oriented financing products.

H_{10}: perceived risk demonstrates negative effect on users' behavioral attitude of using Internet currency-oriented financing products.

In accordance with age and experienced cycle, family lifecycle can be divided into four stages, namely, formation, growth, maturity and senescence. The behavior of investment will be affected in different stages. Therefore, it is hypothesized that family lifecycle plays an adjusting role

in every path of the hypothesis model as a regulated variable.

3. RESEARCH METHODS

3.1 Questionnaire design

The questionnaire in this study is divided into three sections. The first section is respondents' basic information and family status, which includes gender, age group, education background, occupation, marital and parental status, children and family's monthly income; the second section is a measurement scale of influence factors of Internet currency-oriented financing products, which includes six latent variables in the model, such as behavioral intention and group norms, and 3-4 measures are adopted to measure each latent variable. Fu [9], Guo [10] and Zhao et.al. [11] are mainly taken as a reference here. The third section is investors' basic condition of purchasing Internet currency-oriented financing products, which includes time of investment, type of decision-making, objective of financial management, risk attitude, minimum threshold, horizon and proportion of investment, as well as practical questions, etc.

3.2 Data collection

By means of WJX (Http://www.wjx.cn), questionnaires are formulated and distributed. The questionnaires are distributed through QQ Group or WeChat Group through the method of convenience sampling. The distribution of certain variables, such as the respondents' experience of investment, age group and occupation is properly taken into consideration. 373 questionnaires were distributed, and 373 valid questionnaires were collected. Among them, 78.3% questionnaires were submitted through mobile phones, and 21.7% questionnaires were submitted through computers. Please see the result of descriptive statistics of the sample in Table 1 below.

Table 1 Result of Descriptive Statistics of the Sample (n=373)

Item	Value	Frequency	Proportion (%)
Gender	Male	159	42.6%
	Female	214	57.4%
Family status	Single	120	32.2%
	Married and childless	38	10.2%
	Married with one child	185	49.6%
	Married with two children	30	8.0%
Age	Below 25	74	19.8%
	26-35	157	42.1%
	36-45	110	29.5%
	46-55	26	7.0%
	Above 56	6	1.6%
Education Background	Postgraduate	133	35.7%
	Undergraduate	138	37.0%
	Junior college	92	24.7%
	Senior high school and below	10	2.6%
Monthly Income	Below ¥5000	137	36.7%
	¥5001- ¥10000	148	39.7%
	¥10001- ¥20000	61	16.4%
	Above ¥20000	27	7.2%

4. ANALYSIS RESULT

4.1 Analysis of validity

The analysis of exploratory factors is adopted to test the validity. Please see the mathematical model of factor analysis below:

$$X_i = a_{i1}F_1 + a_{i2}F_2 + \cdots + a_{im}F_m + \varepsilon_i \, (i=1,2,\cdots,p; j=1,2,\cdots,m) \quad (1)$$

In this model, X_i is the original variable, F_j is the common factor; α_{ij} is factor loading, which is the correlation coefficient of common factor F_j and the variable X_i in essence; ε_i is a special factor that represents the variable variation triggered by influence factors other than the common factor.

The measures of the questionnaire sale are divided into three groups, which are internal variable (behavioral intention BI), intermediate variable (perceived usefulness PU and behavioral attitude BA) and external variable (perceived ease of use PE, group norms GN and perceived risk PR). KMO index value and Bartlett's test of sphericity are adopted respectively to analyze the applicableness of the factor model of the sample data. It is suggested by the result that the KMO value of the three groups of measures is 0.739, 0.868 and 0.857 respectively, and the Chi-Square value of Bartlett's test of sphericity is 542.090, 1941.680 and 2540.594 respectively, and the significance is 0.000<0.05. It signifies that common factor exists in the measures of the three groups of variables, which is generally or relatively suitable for factor analysis.

The method of principal component analysis (PCA) is adopted to extract factors, and the common factor is

maintained under the standard of extracting a specific number of factors. Furthermore, the method of orthogonal rotation is adopted to twiddle the factors, and exploratory factor analysis is conducted in the measures of the three groups of variables. It is suggested by the result that the amount of explained variance of the common factor of the three groups of measures is 79.2%, 86.1% and 75.9% respectively. The data suggests that every common factor includes measures whose load capacity is above 0.5, and the factor loading of every measure is above 0.75. Furthermore, the information of the majority of measures is contained. The measures of the questionnaire scale can effectively explain corresponding dimensions in statistical testing and manifest satisfying efficacy of construction.

4.2 Reliability analysis

Cronbach α coefficient is adopted in the reliability testing of the scale. The result suggests that the Cronbach α coefficient of every latent variable is greater than 0.8, which demonstrates that the question has satisfying reliability, and it is unnecessary to add or delete measures.

4.3 Model adjustment

In accordance with the above-mentioned hypotheses, an initial diagrammatic figure M_1 is drawn in AMOS, and the fitting of the initial model M_1 is implemented. It is found through the result that the initial model M_1 manifests unsatisfying applicableness in Chi-Square value (χ^2/df), AGFI and RMR, etc. Therefore, the initial model M_1 needs to be amended in accordance with theoretical literature and empirical law:

In accordance with the modification index (M.I.), the increase of "perceived risk (PR) →perceived ease of use (PE)" path in the initial model M_1 can reduce the Chi-Square value by 58.232. Therefore, this path can be added to the initial model M_1 to generate a model M_2, and the following hypothesis can be increased accordingly:

H_{11} : perceived risk demonstrates significantly negative effect on users' ease of using Internet currency-oriented financing products.

In accordance with the estimation of the model M_2, it is found that the coefficient of the path "perceived risk (PR) → behavioral attitude (BA)" is the minimum (0.081), and the value of P=0.118, which is lower than the significance level (0.05), which signifies that the influence of perceived risk on behavioral attitude is insignificant. Therefore, the simplification of the model should be taken into consideration, and the path "perceived risk (PR) → behavioral attitude (BA)" should be deleted to generate the modified model M_3.

Commonly used methods of model estimation include Maximum Likelihood, Generalized Least Squares and Unweighted Least Squares, etc. Specifically speaking, the functional expression of Maximum Likelihood is shown below:

$$F_{ml} = \log|\Sigma| - \log|S| + tr(S\Sigma^{-1}) - \rho \qquad (2)$$

In this expression, ρ is the number of measured variables (p+q), Σ is the estimated population covariance matrix, and S is the covariance matrix of the observed sample.

Maximum Likelihood is adopted to estimate the model M_3, and it is suggested by the result that the model manifests satisfying applicableness: $\chi^2/df = 2.115$, RMSEA=0.055, GFI=0.922, AGFI=0.895, RMR=0.039, CFI=0.973, TLI=0.973, IFI=0.973.

4.4 Result of hypothesis testing

It is suggested by the result of hypothesis testing of the model M_3 that (Table 2) hypotheses H_1, H_2, H_3, H_4, H_5, H_6, H_7, H_8 and H_9 are all supported. It can be seen from the above process of model modification that perceived risk doesn't reach the significance level on the coefficient of the path of behavioral attitude, which suggests that hypothesis H_{10} is not supported here. As to hypothesis H_{11}, which is added to the modification, the result of the testing signifies that perceived risk exerts positive effect on perceived ease of use, which violates common sense and is quite the opposite of hypothesis H_{11}. Therefore, H_{11} is not supported.

Table 2   Model's Standardized Path Coefficient

No.	Path Between Variables	Path Coefficient	Testing Result
H_1	Perceived ease of use PE→ Perceived usefulness PU	0.620***	Supported
H_2	Perceived ease of use PE→ Behavioral attitude BA	0.254***	Supported
H_3	Behavioral attitude BA→ Behavioral intention BI	0.457***	Supported
H_4	Perceived usefulness PU→ Behavioral attitude BA	0.218**	Supported
H_5	Group norms GN→ Perceived usefulness PU	0.363***	Supported
H_6	Group norms GN→ Perceived ease of use PE	0.558***	Supported
H_7	Group norms GN→ Behavioral attitude BA	0.494***	Supported
H_8	Group norms GN→ Behavioral intention BI	0.465***	Supported
H_9	Perceived risk PR→ Perceived usefulness PU	-0.081*	Supported
H_{10}	Perceived risk PR→ Behavioral attitude BA		Not supported

H_{11}	Perceived risk PR→ Perceived ease of use PE	0.377***	Not supported

Note: *** signifies the significance level 0.001; ** signifies the significance level 0.01;* signifies the significance level 0.05.

4.5 Group analysis of family lifecycle

Family lifecycle can be divided into two groups, namely, respondents who have or haven't given birth. In the study of the critical ratio table of the variation of path coefficients of two groups of infinite parameter model (Table 3), it is suggested by the result that the critical ratio of the parameter variance of path coefficient b1_2 and b1_1, b7_2 and b7_1 is 2.05 and 2.289 respectively, and the absolute value is greater than 1.96. Thus, it can be seen that there are significant differences between the two groups in the path coefficient of b1 ("group norms→ behavioral attitude") and

b7 ("group norms→ perceived usefulness"), but the other path coefficients of the two groups don't demonstrate any significant difference under the significance level of 0.05. It is found through further study of the path coefficient of b1 and b7 that families with children (0.615) and families without children (0.345) exert even more apparently positive effect on "group norms→ behavioral attitude". Likewise, families with children (0.452) also manifest greater positive influence than families without children (0.225) in "group norms→ perceived usefulness".

Table 3 Critical Ratio Table of Variation of Path Coefficients

	b1_1	b2_1	b3_1	b4_1	b5_1	b6_1	b7_1	b8_1	b9_1	b10_1
b1_2	2.05	2.536	-1.12	1.298	1.179	0.411	3.369	0.707	6.264	1.24
b2_2	-0.899	0.058	-3.583	-1.431	-1.222	-2.067	0.035	-2.273	2.589	-1.607
b3_2	2.397	2.814	-0.845	1.613	1.447	0.690	3.778	1.061	6.726	1.572
b4_2	0.768	1.437	-1.87	0.193	0.221	-0.508	1.75	-0.429	4.148	0.091
b5_2	-1.451	-0.313	-4.339	-1.998	-1.688	-2.638	-0.459	-3.036	2.392	-2.227
b6_2	0.301	1.034	-2.293	-0.251	-0.178	-0.923	1.245	-0.911	3.622	-0.368
b7_2	0.859	1.615	-2.602	0.086	0.131	-0.793	2.289	-0.808	5.657	-0.054
b8_2	1.05	1.774	-2.598	0.221	0.244	-0.707	2.615	-0.707	6.211	0.084
b9_2	-3.735	-1.913	-6.846	-4.189	-3.462	-4.695	-2.829	-5.928	0.626	-4.628
b10_2	0.237	1.134	-3.156	-0.488	-0.353	-1.313	1.584	-1.486	4.935	-0.667

5. DISCUSSION

The investment influence model of Internet currency-oriented financing products is verified in the study (Figure 2), and the following main conclusions are reached:

Behavioral intention is directly under the significantly positive effect of group norms (0.465***) and behavioral attitude (0.457***). With every unit of increase in group norms or behavioral attitude, the behavioral attitude will increase 0.465 or 0.457 unit respectively.

Group norms, which plays a crucial role, is under the regulation of family lifecycle to a certain extent. Other than the direct influence on behavioral intention, group norms also exerts indirect influence on behavioral intention through such intermediate variables as perceived ease of use (0.558***), perceived usefulness (0.363**) and behavioral attitude (0.494***), etc. In comparison with families without children, families with children demonstrate stronger significant positive effect in the act of group norms

on perceived usefulness and behavioral attitude. However, whether a family has children doesn't have any significant regulation on other path coefficients.

Behavioral attitude is under the direct influence of group norms, perceived usefulness and perceived ease of use under the sequence of group norms 0.494 (***), perceived ease of use 0.254 (***) and perceived usefulness 0.218 (**) from the top to the bottom. As perceived ease of use acts on behavioral attitude, it also exerts indirect influence on behavioral attitude through the intermediation of perceived usefulness.

From the top to the bottom, influence factors of perceived usefulness are perceived ease of use (0.620***), group norms (0.363**) and perceived risk (-0.081*). Internet currency-oriented financing products can be purchased anytime and anywhere through the Internet or mobile terminal, which tremendously reduces the time cost of investment and procurement, improves usage experience and reinforces products' perceived ease of use.
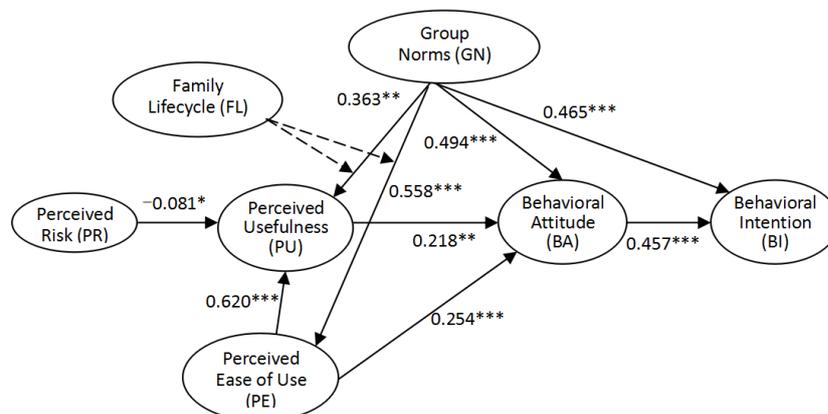

Figure 2 Investment Influence Model of Internet Currency-oriented Financing Products

Note: *** signifies the significance level 0.001; ** signifies the significance level 0.01;* signifies the significance level 0.05.

6. CONCLUSION

The contribution of this study is to introduce the family lifecycle variable into the influence model of investment in Internet currency-oriented financing products, and to turn the research perspective from personal financing management to family financial management. Also, this study provides a theoretical basis for the design of Internet currency-oriented financing products for family investors. The influencing factors of the investment in the Internet currency-oriented financing products and the mechanism of the factors explained in the article can provide valuable inspiration and guidance for the design, service, platform and marketing of the Internet currency-oriented financing products. For example, the positive effect of perceived ease of use shows that enterprises should focus on improving the user experience of the financial platform, reducing the learning cost of the user's platform, and improving the user's perceived ease of use for the financial platform. As a key influence factor, the group norms indicates that measures should be taken to support and encourage investors to recommend financial products to their relatives or friends in order to improve the marketing effect of the products.

Of course, due to the limitations of some conditions, the research variables and research samples need further improvement. In the next step, other factors such as consumer innovation, expected income or self-efficacy can be added into the influence model. At the same time, it is considered to improve the sample distribution in demographic characteristics, financial product characteristics and so on.

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