

5. Christopher L. Weber. Measuring structural change and energy use: Decomposition of the US economy from 1997-2002[J]. *Energy Policy*, 2009, (37): 1561-1570
6. Mac B, Stern DI. China's changing energy intensity trend : a decomposition analysis[J]. *Energy Economics*, 2008, (30): 1037-1053
7. T.Y. Chen J. Burnett C.K. Chau. Analysis of embodied energy use in the residential building of Hong Kong [J]. *Energy*, 2011, (26): 323-340
8. Shonali Pachauri, Daniel Spreng. Direct and indirect energy requirements of households in India[J]. *Energy Policy*, 2012, (30): 511-523
9. Reinders A.H.M.E., Vringer K., Blok K. The direct and indirect energy requirement of households in the European Union[J]. *Energy Policy*, 2013, 31(2): 139-153
10. Li Hong, Zhang Per Dong, He Chunyu, Wang Gang. Evaluating the effects of embodied energy in international trade on ecological footprint in Chian[J]. *Ecological Economics*, 2007, (62): 136-148
11. Allan J. A. Virtual Water: a Long Term Solution for Water Short Middle Eastern Economies? Paper Presented at the 1997 British Association Festival of Science [R]. University of Leeds 2007, (9): 519-520
12. Erik Dietzenbacher. Virtual Water and Water Trade in Andalusia: A study by Means of an Input-Output Model [R]. Working Paper, 2010: 259-267



Research on Commercial Bank's Personal Financing Business Usage Intention Model

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Abstract

For deeply understanding of factors affecting consumer choice, using Technology Acceptance Model (TAM) for reference, the paper develops a model for commercial bank's personal financing business. The instance analysis indicates that the model and the result are effective and significant about consumer choice. In the future it is necessary to further extend effects factors. And to explore the relationship between various factors under different economic and financial environment changes will be a new direction.

Keywords: COMMERCIAL BANK, PERSONAL FINANCIAL SERVICES, INTENTION TO USE, TECHNOLOGY ACCEPTANCE MODEL, STRUCTURAL EQUATION MODELING.

1. Introduction

Personal finance business is refers to the commercial Banks for individual customers with financial analysis, financial planning, investment advisory, asset management, and other professional service activities. With China's sustained and rapid economic development and national wealth accumulation, China's banking personal finance business from scratch and growing. According Wande information statistics, the year 2009 China's commercial banks personal financial products issued section 7315, 2011 circulation of financial products is to achieve a historic breakthrough, as of December 20, 2011, issue of the number of more than 17,000 models, in July 2012 commercial banks a total of 2485 models of personal financial products, the first half of 2015, a total of 301 commercial banks to issue a personal financial products section 34731. Although the domestic personal finance market growth is gratifying, but compared with European and American banks, personal financial services of commercial banks is still in its infancy, in product innovation, customer service, business management and other aspects, there are many shortcomings. So with the opening up of China's financial markets and foreign banks enter the domestic commercial banks by foreign banks , domestic commercial Banks feel the biggest impact is the personal finance business, including a series of intermediate business, personal financial services, especially high-end customer resources has become the banking industry the focus of competition.

Given the above, how to get a comprehensive understanding of personal finance demand of residents in our country, introduced to adapt to the domestic demand personalized products, provide the omni-directional high-quality service for the customer, make its become the new profit growth point of domestic commercial Banks, leading to the improvement of the overall competitiveness, Chinese commercial Banks has become an important problem demanding prompt study in its banking industry in our country. This paper intends to introduce systematic analysis method, summarized through literature and field surveys to collect the user to select the influence factors of personal finance products, constructing principle and application technology acceptance model, structural equation model, And with the domestic and foreign related research contrast and cross validation , it has both theoretical innovation and practical guidance significance.

Because of the personal finance business has achieve rapid development in Europe and the United States commercial Bank since the 1970s, so for-

eign scholars did a lot of research about personal financial business of commercial Banks, involves the content is relatively broad and varied, including personal finance user groups analysis[1,2], Personal finance research through the network[3], Personal financial management skills [4]and personal financing behavior research[5], and so on. In the study of user behavior personal finance, Spinella M [5], Julie [6] and Schmid [7] other studies have shown individual financial behavior and everyday decision-making tends to be relevant, Nofsinger [8] thinks rational financial behavior to evaluate multiple fuzzy variables, so it is highly complexity and variability. On the basis of, Seghers [9] studies suggest that personal habits and cultural backgrounds play an important role in personal financial behavior, Birtch [10] found that personal finance impulsive decisions more influenced by depression, anxiety and other emotional factors fanaticism through the survey of 138 college students , built up a system of personal financial behavior analysis EPFS model, factors affecting the economic base, money attitudes and personal feelings such as a comprehensive research and empirical testing.

Scholars for personal finance commercial banks has been carried out multi-level research in many fields and have made certain achievements, laying a good foundation for this study. But after reading literature analysis, the existing research can be found the following deficiencies: First, foreign study focused study personal finance behavior as consumers demand side, while the domestic research is concerned as a commercial bank financial products structure the supply side, although domestic and international research priorities are different, but they lack the combined analysis of both supply and demand system; Second, domestic scholars to explore personal financial research was restricted to qualitative theory, and the lack of strong support for empirical research[11]; Third, compared to foreign relates to the field of psychology, sociology and other personal finance-related research, the depth and breadth of domestic research in this regard there is a big gap, which for China's commercial banks personal financial services product design and marketing are very negative. Therefore, this article is based on my personal financial services market, we intend to use the system analysis method, from a consumer point of view factors using personal financial services for comprehensive analysis and then build the relational model and empirical test[12].

2. Model Building

The nature of personal financial services of commercial banks belonging to the specialized technical service, and for the adoption and proliferation of

certain services research in theory has a long history, which is considered the clearest and most influential was undoubtedly also the most practical Technology Acceptance Model(TAM). Thus reflecting the impact of technology acceptance model of depth and breadth, paper is based on the principle of the model Construction of a model factor. Technology .Acceptance Model is a model using Davis Theory of Reasoned Action(TRA) study when the user accepts the proposed information systems, The model that the system behavior is caused by behavioral intention(BI) decision, The behavioral intention by attitude toward using and perceived usefulness of joint decision, attitude toward using by the perceived usefulness and ease of use, perceived usefulness and the perceived ease of use external variables together determine the perceived ease of use is determined by external variables. The core idea is Perceived Usefulness and Perceived Ease of Use considered the impact the intended use of two important factors, from the perspective of personal attitudes to explain the use of a particular technology or service tends to Infrastructure model shown in Figure1.

TAM model since its inception, in various technical / service fields have been widely used and validated researchers, Such as financial services or mobile operators value-added services. Studies have shown that as long as the appropriate model for TAM expansion and modifications can be a good find and interpret user adoption process for the new technology, the user's behavior to predict and explain some, in a variety of technical / service environment, TAM model has good robustness and adaptability.

According to TAM model "Attitude-Intention -Behavior" three-tier structure, behavioral intentions

reflect the user to choose to use personal financial business has shown willingness, it is a necessary condition before the user action. In past studies, researchers have proved to be reliable behavioral intentions observed variables, there is a direct correlation between behavioral intention and actual user behavior, and behavioral intention can well predict the user's behavior.

According to the basic structure of TAM model, the behavior of the user's intention as to predict and explain the main indicators of user behavior, in combination with the characteristics of personal financial services, and appropriately increase the number of external factors, built up using personal financial services intention model (Figure 2), and made the following assumptions:

H1: The user's attitude has a positive effect on the intention to use personal financial services.

In the analysis of the impact of personal financial services users' attitude, this paper draws on technical / service adoption and financial innovation research eventually could use the potential variables affecting attitudes attributed to the four aspects of Perceived Usefulness, Perceived Ease of Use, Risk perception and Trust perception.

In the TAM model, Perceived Ease of Use are individuals of a technical/service system is easy to learn and use the degree to believe. The study found that Perceived Ease of Use affect users attitudes towards technology/service systems. Therefore, based on personal financial services propose the following hypothesis:

H2: Perceived Ease of Use to use personal financial services of commercial banks has a positive impact on the use of attitude.

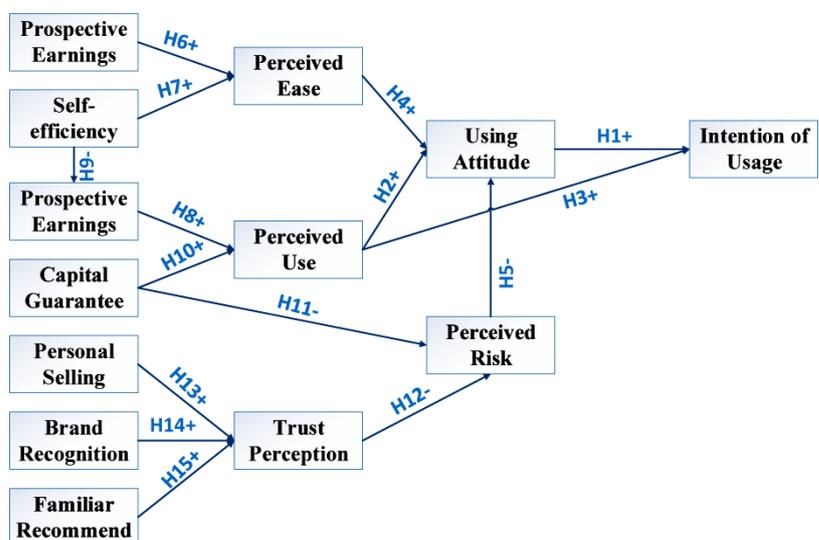
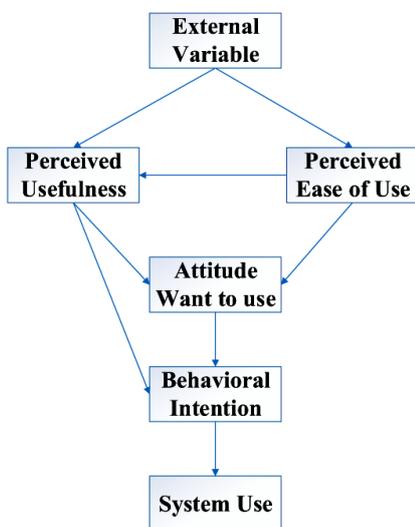


Figure 1. Technology Acceptance Model

Figure 2. The Model of Personal Finance Business use Intention

In addition, this paper personal financial services inherent characteristics and social cognitive theory relevant content that the financial terms of individual business transactions provided by commercial banks whether they have straight forward feature (herein defined as “simple transaction”), and users have the financial skills and self-awareness (self-efficacy) will affect users of the personal financial services of commercial banks to use perceptual formation. Among them, the “self-efficacy” is a core concept in Social Cognitive Theory (SCT), Bandura defined as organizations or individual is expected to complete certain activities and the ability to achieve the desired goal. Self-efficacy not only has the ability to contain individual, but also includes individuals use their own skills to be able to do a subjective judgment. Therefore, we assume:

H3: Trading simple has a positive effective on Perceived Ease of Use to personal financial services.

H4: Self-efficacy has a positive effect on Perceived Ease of Use to personal financial services.

Perceived Usefulness is that users know whether to believe that the use of commercial bank personal finance business will be significantly improved its financial benefits and wealth accumulation, it can be used not only by the indirect effects of the user’s intention to use attitude, behavior and can act directly on the user’s intent.[26,27]Studies have shown that users are often based on the expected benefits of the size and principal level of protection provided by commercial banks to make a subjective value judgments about personal finance products, and then make the purchase decision. With high financial users tend to underestimate the skills of personal financial services for their utility value. Therefore, we propose the following hypothesis:

H5: Perceived Usefulness has a positive effect on personal financial services attitudes.

H6: Perceived Usefulness has a positive effect on personal financial services Use intention.

H7: self-efficacy has a negative effect on Perceived Usefulness to personal financial services.

H8: Prospective earning has a positive effect on Perceived Usefulness to personal financial services.

H9: The principal protection has a positive effect on Perceived Usefulness to personal financial services.

Important factors that influence risk perception as to the actual purchaser viewer conversion refers to a specific purchase in the environment, consumers perceive all the uncertainty. Buying behavior marketing industry is a risk-taking behavior, consumer goods and services purchased for risk perception will direct-

ly affect buying decisions. For our part, the consumers used by the degree of risk for habitual trust banks and state-owned background guarantee the safety of principal to determine whether personal financial services. In view of this, we assume:

H10: Risk perception has a negative effect on personal financial services attitudes.

H11: The principal protection has a negative effect on Risk perception to personal financial services.

H12: Trust perception has a negative effect on Risk perception to personal financial services.

Trust is “based on the expectations of the other party to complete a specific action of one’s own importance, the other party is willing to accept one’s own actions may cause harm, regardless of whether one’s own ability to control the other party oversight”, The key is to trust those who define themselves in a vulnerable position, it is worth the potential risk of the trust relationship has lost some important things. Perception is particularly important for the safety of assets related to the user with a high degree of uncertainty and personal financial services. Trust perception studies show that our consumers in addition to state-owned background, the historic and well-known commercial banks outside the traditional trust, including students and other relatives and friends recommended acquaintance introduced can also be an effective consumer confidence. In addition, the professionalism and marketing skills of field staff of commercial banks and other financial managers also establish personal financial services to consumer trust has a positive impact. Therefore, we propose the following hypothesis:

H13: Personal selling has a negative effect on Trust perception to personal financial services.

H14: Brand awareness has a negative effect on Trust perception to personal financial services.

H15: Acquaintances recommended has a negative effect on Trust perception to personal financial services.

3. Questionnaire Design and Data Collection

3.1. Questionnaire design

In this study, all measure Likert scale questionnaire are 7-point manner of expression, the questionnaire asked respondents to measure that attitude, 1-7 points respectively means strongly disagree, disagree, somewhat disagree, neutral, somewhat agree, agree, strongly agree. The main measure of the questionnaire were draw on relevant research literature, as follows: Use intent and attitude measurements using Venkatesh and Davis index from research; Perceived Ease of Use and Perceived Usefulness measure evolved according to Davis’s original scale; The

risk perception measure is derived from the study of Wang; Trust perception of measurement based on the definition of Schneide developed; Self-efficacy of measurement according to the research of the Pedersen, design and production. Then, on the basis of personal finance and banking have sector consulting relevant experts, this study and the questionnaire measure preliminary design for the corresponding amendments and additions.

The final item questionnaire divided into empirical part of the problem and part of the basic questions: Where empirical part of the problem, including transaction is simple and self-efficacy, expected benefits, principal protection, personal selling, brand awareness and Referral section 7, a total of 35 questions; The basic problem part is age, education, household income, occupation and other content.

3.2. Data collection

After composing the original questionnaire, on the part of the customer Luoyang Branch of Bank of Communications Mill Road business department of trial questionnaire survey, it was 150 valid questionnaires were obtained. After the survey data to test reliability analysis, and with the survey responses, modify some of the measure and to further adjust the formal questionnaire survey format based on analysis results.

In this study, the main formal investigation in August 2013-January 2014 extracts Commercial Bank of China, China Construction Bank, Bank of Communications, CITIC Bank, China Merchants Bank and China Minsheng Bank as a representative of China's commercial banks in Zhengzhou, Luoyang and Shenzhen city, in both city six banks personal financial services customers as a sample survey. Survey questionnaires were distributed and 600 were returned 560 questionnaires, response rate was 93.33%, of which 532 valid questionnaires, the effective rate of 88.67% questionnaires. Missing or invalid questionnaires are mainly two types of distortion.

In the calculation the definition of Cronbach's α as formula (1):

$$\alpha = \frac{k}{k-1} \left(1 - \frac{\sum \sigma_i^2}{\sigma^2} \right) \quad (1)$$

k is the number of questions in the questionnaire. σ_i^2 is the variance of survey result of question i . σ^2 is the variance of survey result.

In the Goodness-of-fit, f_0 is the actual observed frequency. f_e is the theoretical frequency. The definition of χ^2 as formula (2) and formula (3):

$$\chi^2 = \sum_k \frac{(f_0 - f_e)^2}{f_e} \sim \chi^2(df) \quad (2)$$

$$\chi^n = \sum_k \frac{(f_0 - f_{en})^2}{f_{en}} \sim \chi^2(df_n) \quad (3)$$

For the test of significance, using statistics Z as formula (4):

$$Z = \frac{\sum_{i=1}^k w_i d_i}{\sqrt{\sum_{i=1}^k w_i p_i q_i}} \quad (4)$$

$$d_i = p_{i1} - p_{i2} \quad (5)$$

$$w_i = \frac{n_{i1} \times n_{i2}}{n_{i1} + n_{i2}} \quad (6)$$

In the formula (5), p_{i1} and p_{i2} are the ratio of the four case table i ; n_{i1} and n_{i2} in the formula (6) are the number of marginal of the four case table i .

$$w_{in} = \frac{n_{in} \times n_{in}}{n_{in} + n_{in}} \quad (7)$$

$$\alpha_n = \frac{k_n}{k_n - 1} \left(1 - \frac{\sum \sigma_{in}^2}{\sigma^2} \right) \quad (8)$$

3.3. Relation of distance district mapping

The survey questionnaire shown effective sample characteristics information as shown in

Table 1. Sample Feature Information

Characteristic Index		Distribution	
Gender	Male	274	51.50%
	Female	258	48.50%
Age	18~29	101	18.98%
	30~39	138	25.94%
	40~49	165	31.02%
	50~59	79	14.85%
	≥60	49	9.21%
profession	Company employee	108	20.30%
	Civil Servant	95	17.86%
	Institution	119	22.37%
	Private owner	98	18.42%
	Retirees	92	17.29%
Monthly Income	≤2000	125	23.50%
	2001~3500	149	28.01%
	3501~5000	132	24.81%
	5001~6500	68	12.78%
	6501~8000	41	7.71%
The Degree of Education	≥8000	17	3.20%
	High School or less	116	21.80%
	College	167	31.39%
	Undergraduate	185	34.77%
	Graduate and above	64	12.03%

As can be seen from Table 1, the ratio of the sample of this survey is not very different in men and women, men 51.5%, women accounted for 48.5%; the proportion of youth between the ages of 30 to 49 years old was 56.96%; corporate officers, sample proportion of civil servants and employees of public institutions is 60.53%; the proportion of samples monthly income between 2,001 yuan to 6,500 yuan was 65.6%; the sample proportion of college education was 78.2%. Thus, the survey sample in line with the sample characteristics technology acceptance model.

4. Construction and Results of Structural Equation Modeling Analysis

For this study, data analysis and model validation using Structural Equation Model (SEM) and software tools for AMOS. Structural equation model is the application of the system of linear equations represents a statistical method relationship between observed variables and latent variables and latent variables, because it can handle the amount of complex research data, SEM and AMOS software has become psychology and other social science disciplines a widely used empirical analysis of ideas and technologies.

The need for reliability test questionnaire before path analysis, this study had Cronbach's α coefficient to examine the internal consistency of the questionnaire indices. Social science research is generally believed Cronbach's α coefficient is lower than 0.3, a low reliability, should refuse to use; Cronbach's α coefficient between 0.5 and 0.7 is acceptable; and Cronbach's α coefficients if higher than 0.7 compared with high reliability, that has good reliability. As can be seen from Table 2, using SPSS statistical software to calculate the entire questionnaire Cronbach's α coefficient was 0.8264, Cronbach's α coefficients of most factors were above 0.7, indicating that the intrinsic reliability of the whole questionnaire index system is ideal.

Table 2. Questionnaire Reliability Test

Model Factors	Question Number	Cronbach's α
Use Intention	2	0.7223
Use attitude	3	0.7069
Risk Perception	3	0.7629
Perceived Ease of Use	4	0.6908
Perceived Usefulness	2	0.7392
Trust perception	2	0.6835
Easy Trading	3	0.7185
Self-efficacy	2	0.8098
Expected return	3	0.8331
Capital protection	2	0.8633
Personal selling	4	0.8035
Brand awareness	4	0.7227
Referral	1	0.7935

Structural equation model to measure the degree of fit of the model had to the data by fitting index. Commonly used model fit index are the following: The chi-square χ^2 ratio of its freedom χ^2/df , Goodness-of-fit index (GFI), Adjusted Goodness-of-fit index (AGFI), Normed fit Index (NFI), Comparative Fit Index (CFI), Standardized Root Mean Square Residual (SRMR) and Root Mean Square Error of Approximation (RMSEA) Wait.

The study was run AMOS software gives Indexes fit the model, as shown in Table 3. According to common evaluation criteria can be seen, the indicators are in line with the requirements of a good research model fit.

Table 3. Model Fit Index

Model Name	Recommended Standard	Model Validation Results
χ^2/df	< 3	2.864
GFI	> 0.9	0.971
AGFI	> 0.9	0.962
NFI	> 0.9	0.997
CFI	> 0.9	0.953
SRMR	< 0.08	0.076
RMSEA	> 0.1	0.094

Structural equation modeling using maximum likelihood estimation, ultimately proven model shown in Figure 3, all assumptions path coefficients significantly R2 value level and six endogenous variables are given in the figure.

Test results show that this model is the use of intention to use attitude, risk perception, Perceived Ease of Use, Perceived Usefulness and trust perceptual interpretation perceived strength of six endogenous variables are close to 50%, exceeding the general use of TAM models predict about 40% explanation level of the user's behavior was more accurate forecasting and analysis.

The Construction of the model 15 is assumed, in addition to H7 (self-efficacy for sexy useful for personal financial services known to have a negative impact), H9 (useful for sexy principal guarantees of personal financial services known to have a positive impact) and H14 (brand awareness of personal financial services have a positive impact on the perception of trust) three assumptions have not been verified, the other 12 were under the assumption of 90% significance level is significant. From the direction of action of various factors, the data analysis model obtained in this study investigated the logical and reasonable interpretation of user behavior sufficiently well to reveal the user Factors Affecting

Commercial Bank personal financial services and internal relations.

Conclusions

For deeply understanding of factors affecting consumer choice, using Technology Acceptance Model (TAM) for reference, the paper develops a model for commercial bank's personal financing business. The instance analysis indicates that the model and the result are effective and significant about consumer choice. In the future it is necessary to further extend effects factors. And to explore the relationship between various factors under different economic and financial environment changes will be a new direction.

References

1. Hogan, Paula. How to Make Personal Finance «Connect» With Young Adults. *AAII Journal*, 2003, 25, p.p.33-35.
2. Volpe Ronald P, Haiyang Chen, Sheen Liu. An analysis of the importance of personal finance topics and the level of knowledge possessed by working adults. *Financial Services Review*, 2006, 15, p.p.81-98.
3. Woerheide, Walt. The Internet in the personal finance course. *Financial Services Review*, 1999, 8, p.p.305-318.
4. Tennyson, Sharon, Chau Nguyen. State Curriculum Mandates and Student Knowledge of Personal Finance. *Journal of Consumer Affairs*, 2001, 35, p.p.241-262.
5. Spinella M, Yang B, Lester D. Development of the Executive Personal Finance Scale. *International Journal of Neuroscience*, 2007, 117, p.p.301-313.
6. Julie A. Elston, David B. Audretsch Financing the entrepreneurial decision: an empirical approach using experimental data on risk attitudes. *Small Business Economics*, 2013, 36, p.p. 209-222.
7. Schmid T. Control considerations, creditor monitoring, and the capital structure of family firms. *Journal of Banking and Finance*, 2013, 51, p.p.257-272.
8. Nofsinger JR, Wang W. Determinants of start-up firm external financing worldwide. *Journal of Banking and Finance*, 2014, 52, p.p.2282-2294.
9. Seghers A., Manigart, S., Vanacker T. The impact of human and social capital on entrepreneurs' knowledge of finance alternatives. *Journal of Small Business Management*, 2012, 50, p.p.63-86.
10. Au K., Birtch, T. T., Chiang F., Ding, Z. J. Incubating the next generation to venture: a case study of a Hong Kong family business. *Asia Pacific Journal of Management*, 2013, 30, p.p.749-767.
11. Voss U, Brettel M. The Effectiveness of Management Control in Small Firms: Perspectives from Resource Dependence Theory. *Journal of Small Business Management*. 2014.52.p.p.569-587.
12. Nguyen T H, Newby M, Macaulay M. Information Technology Adoption in Small Business: Confirmation of a Proposed Framework. *Journal of Small Business Management*. 2015.53.p.p.207-227.

