Mobile payments and individual risk preferences

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Abstract. Based on data from the 2015, 2017, and 2019 China Household Finance Survey (CHFS), this paper empirically examines the impact of mobile payment on individual risk preferences using a two-way fixed effects model. The findings indicate that mobile payment significantly enhances individuals' propensity for high-risk preferences. This conclusion remains robust after conducting various tests, including substituting the core variable with online shopping expenditure, restricting the sample to working-age individuals, and employing the Probit model. Heterogeneity analysis reveals significant differences in these promotional effects between urban and rural areas as well as across different regions. Notably, such effects are pronounced in rural areas and central regions but are not observed in urban settings or among eastern and western regions. Mechanism analysis indicates that attention to financial information serves as a positive moderating factor; thus, mobile payment influences risk decision-making through its complementarity with individual cognitive abilities. This study provides an empirical foundation for understanding how digital technology reshapes microeconomic psychology and offers policy implications aimed at enhancing digital financial regulation while strengthening targeted financial literacy education.

Keywords: Mobile Payment, Individual Risk Preference, Attention to Financial Information.

1. Introduction and literature review

1.1. Introduction

With the rapid advancement of digital technology and the widespread adoption of smartphones, mobile payment has transitioned from an emerging payment tool to a fundamental infrastructure that permeates daily economic activities. This evolution has significantly altered individuals' consumption patterns, savings behaviors, and financial engagement practices. In this context, an important yet under explored academic inquiry has gradually surfaced: does mobile payment merely function as a convenient technological channel? To what extent does the utilization of mobile payment systematically reshape users' risk perceptions and decision-making preferences?

Research in behavioral finance and experimental economics has consistently demonstrated that individual risk decisions are significantly influenced by the decision-making environment and underlying psychological mechanisms. Mobile payment systems create a novel choice architecture through their distinctive technical attributes, including the immediacy and intangibility of transactions (which diminishes "payment pain"), the digital representation of currency, the seamless integration of consumption contexts, and the extensive availability of embedded credit tools.

At the theoretical level, elucidating the relationship between mobile payment and individual risk preference is instrumental in bridging the macro development trends of fintech with the micro-level decision-making mechanisms of individuals. This understanding provides an empirical foundation for comprehending how digital technology reshapes economic psychology and expands the theoretical boundaries of behavioral finance within a digital context. At the practical level, identifying the mechanisms through which mobile payment influences risk preference holds significant value for enhancing consumer financial protection systems, promoting financial literacy education, and optimizing regulatory policies.

The marginal contributions of this study are as follows: First, from a research perspective, this study deepens the understanding of the micro-mechanisms underlying "technology reshaping behavior." Second, in terms of research methodology, this study is dedicated to establishing a more rigorous analytical framework for causal inference. By utilizing the micro panel data from the China

Household Finance Survey (CHFS), we effectively control for individual heterogeneity and household fixed effects that remain constant over time. Thirdly, regarding research data, this study fully leverages the unique advantages offered by CHFS data to broaden the scope of investigation. The CHFS dataset not only provides detailed information on household assets, liabilities, and payment behaviors but also encompasses multi-dimensional measures of risk preferences along with an array of rich control variables at both household and regional levels.

1.2. Literature review

With the popularity of mobile payment, its role in changing consumers' payment habits, promoting financial participation and influencing individual decision-making has attracted increasing academic attention. Changchit et al. (2024) pointed out that personality traits such as openness and agreeableness significantly affect individuals' perception of the risk of mobile payment, thus affecting their willingness to use it [1]. Similarly, Belanche etc. (2022) in the Spanish P2P system Bizum found that the direct effect of perceived risk on behavior intention was not significant, but the user perceived security is low, the negative impact of risk perception will be amplified, explain the role of risk perception has situation dependence [2]. Li and Di Zheng (2023) found through a laboratory game that compared with cash payment, subjects showed a stronger altruistic tendency when using mobile payment, but found no significant difference in risk attitude [3]. Qiu, such as (2025) based on the research of Chinese family's financial survey data is further revealed that the use of mobile payment family tends to be more involved in financial market risk, the mechanism is that mobile payment increased access to information ability, social interaction frequency and risk tolerance [4]. Alrawad et al. (2023), taking NFC payment as an example, pointed out that perceived risk and trust are the key factors affecting the willingness to use, among which process trust and characteristic trust can effectively alleviate the negative impact of risk perception [5]. Chen and Lai (2023) found through the AHP method that although perceived risk was not the most important barrier to adoption in Taiwan, its negative impact was alleviated when perceived usefulness and ease of use were high [6]. Yang et al. (2025) found that risk-averse entrepreneurs are less likely to choose online or hybrid business models, while social insurance can alleviate the inhibitory effect of risk preference on e-commerce adoption, especially in rural areas [7]. Huang et al. (2024) proposed that non-financial institutions should strengthen information security risk management and improve the risk project identification and control mechanism [8]. Mahler and Murphy (2024) pointed out from the perspective of user experience design that the combination of simplified operation and sensory elements can reduce users' risk perception and improve their willingness to use [9]. Ramtiyal et al. (2024) further showed that contextual factors had a stronger moderating effect on risk perception and behavioral intention than demographic variables in their research on Indian unorganized retail merchants [10].

2. Research design

2.1. Data sources

The data for this study are derived from the China Household Finance Survey (CHFS), which is conducted by the Survey and Research Center of Chinese Household Finance at Southwestern University of Finance and Economics. Employing a multi-stage, stratified random sampling method that is proportional to population size (PPS), the CHFS gathers micro-level data on household assets, liabilities, income, consumption, and financial behavior across China. This dataset is highly representative at both national and provincial levels. To investigate the relationship between mobile payment usage and individual risk preferences.

Due to data permission limitations, the data years currently available for non-CHFS institution personnel to apply for are 2009, 2011, 2013, 2015, 2017, and 2019 respectively. The latest two issues, 2021 and 2023, are currently only available for use by teachers of Southwestern University of Finance and Economics (SWUFE).

This study integrates survey data from 2015, 2017, and 2019 to construct an unbalanced panel dataset.

2.2. Model Design

This study uses a two-way fixed effect model to analyze the impact of mobile payment on individual risk preference, and the model is constructed as follows:

$$model_{it} = \alpha + \theta risk_{it} + \lambda control_{it} + \mu_i + \tau_t + \varepsilon_{it} \quad (1)$$

In the above formula, subscript i represents the interviewed families, t represents time; model_{it} indicates whether family i has a smart phone at time t or not; $risk_{it}$ indicates the personal risk attitude of family i at time t; $control_{it}$ is a series of control variables; α is the intercept term, μ_i is a family fixed effect, τ_t is the time fixation effect, θ_{it} is an error term. It represents the impact effect of mobile payment on an individual's risk preference. The positive coefficient indicates a positive effect, while a negative coefficient indicates an inhibitory effect.

2.3. Variable description

(1) Explained variable:

Mobile payment (*mobel*): Binary variable. Using whether one has a smart phone as an indicator for "mobile payment". Setting 1 if an individual has a smart phone, and 0 if not. The main reasons for choosing this indicator are as follows: First, existing studies (Li Genqiang et al.) mostly use "smartphone usage" as a surrogate variable for "mobile payment" [11]; Secondly, as the chfs questionnaire changes in each period, indicators such as the frequency of Alipay, wechat Pay, and mobile payment do not all appear in the data of the three periods of 2015, 2017, and 2019. However, to make up for the measurement error in this aspect, subsequent studies adopted "online shopping expenditure" as an explanatory variable and other measurement methods.

(2) Core explanatory variable:

Personal risk preference (*risk*): Binary variable. Using an individual's risk attitude as an indicator of "personal risk preference". Setting a value of 1 for those who prefer high risk, and 0 for those who do not.

(3) Control variable:

Age (*age*): Continuous variable, measured by the actual age of the household head. Health condition (*health*): Ordered categorical variable, according to the self-assessment of health status by the household head, it is classified into grades 1 to 5 (1= very poor, 5= very good). Marital status (*marriage*): Binary variables, 1 indicates married, and 0 indicates unmarried (including divorced, widowed, etc.). Gender (*gender*): Binary variables,1 represents male and 0 represents female. Family economic situation (*asset*): It is expressed by taking the logarithm of the total family assets. The descriptive statistics of variables are shown in Table 1.

Table 1. Descriptive statistics of main variables

VarName	Obs	Mean	SD	Min	Max
risk	27537	0.0494	0.2168	0.0000	1.0000
mobel	27537	0.6044	0.4890	0.0000	1.0000
age	27536	54.3643	12.8630	2.0000	99.0000
health	27536	2.0631	1.2136	0.0000	5.0000
marriage	27537	0.8844	0.3197	0.0000	1.0000
gender	27537	0.7960	0.4030	0.0000	1.0000
asset	27530	12.6812	1.6535	0.0000	20.4139

3. Empirical research

3.1. Benchmark regression

The benchmark regression results are shown in Table 2. In the basic regression with only year and region fixed effects controlled, the coefficient of "core explanatory variable" is 0.011, which is significant at the statistical level of 5% ($p < 0.05$). This positive relationship indicates that, holding other macro factors constant, individuals who own smartphones are 1.1 percentage points more likely to show high risk preferences. The results remain robust when a series of individual - and household-level control variables are included (Model 2).

In terms of control variables, health status (health) showed a highly significant positive effect in Model 2 (coefficient 0.007, $p < 0.01$), indicating that individuals with better health status may be more prone to high-risk preferences. Other control variables such as age, marital status, gender and household assets were not significant in the model, suggesting that their direct correlation with risk preference was relatively weak after controlling other factors, but this did not weaken the explanatory power of the core variables.

Table 2. Benchmark regression

	(1)	(2)
	risk	risk
mobel	0.011**	0.010**
	(0.005)	(0.005)
age		-0.000
		(0.000)
health		0.007***
		(0.002)
marriage		-0.007
		(0.008)
gender		0.004
		(0.005)
asset		0.002
		(0.002)
_cons	0.043***	0.022
	(0.003)	(0.028)
N	27537	27528
F	5.732	3.363
Year fixed	√	√
Region fixed	√	√
r2_a	0.106	0.108

* $p < 0.1$,** $p < 0.05$,*** $p < 0.01$, clustering to the individual level, the same below

3.2. Robustness test

The results of the robustness test are presented in Table 3. In Column (1), this study substitutes the core explanatory variable "whether you own a smartphone" with "online shopping expenditure" (intbuy) to further assess the robustness of mobile payment's impact on individual risk preference. The findings indicate that, after controlling for various factors such as age, health status, marital status, gender, and household assets, the coefficient for online shopping expenditure is 0.005 and is statistically significant at the 1% level. Consequently, by altering the measurement approach of the core independent variables, the results in Column (1) of the robustness test provide additional confirmation regarding the reliability of this study's primary conclusions.

Column (2) of Table 3 presents the regression results when the sample is confined to the working-age population aged between 18 and 60. In this more homogeneous and economically active subsample, the significance of the core explanatory variables remains unchanged. This observation

may be attributed to the fact that this age group constitutes the primary users of mobile payment systems and various financial products, with their financial decision-making behavior being more responsive to exposure to digital technology. Consequently, this enhances the clarity of the relationship among the core variables. Furthermore, health continues to exert a significant positive impact at a level of 1%, thereby reinforcing the importance of fundamental personal attitudes towards risk.

Column (3) of Table 3 presents the regression results obtained by employing the Probit model as an alternative estimation method. This approach aims to assess whether the benchmark conclusion is influenced by the potential limitations inherent in the linear probability model. The findings indicate that the marginal effect coefficient of the core explanatory variable is 0.182, which is statistically significant at the 1% level. This suggests that the positive impact of mobile payment on risk preference remains robust and statistically significant.

Table 3. Robustness test

	(1)	(2)	(3)
	risk	risk	risk
intbuy	0.005***		
	(0.001)		
mobel		0.013**	0.182***
		(0.006)	(0.033)
_cons	-0.044	0.036	-1.645***
	(0.081)	(0.043)	(0.136)
N	7903	17397	27528
F	3.617	3.161	
Control variables	√	√	√
Year fixed	√	√	×
Region fixed	√	√	×
r2_a	0.094	0.112	

4. Heterogeneity analysis

The results of the heterogeneity analysis are presented in Table 4. In the sample of rural residents shown in Column (1), the coefficient of the core variable is 0.014, which is statistically significant at the 5% level. This indicates that mobile payment serves a dual role of "inclusiveness" and "enlightenment" in rural areas: it not only provides a convenient payment tool but also may serve as an initial channel through which many rural residents systematically engage with digital financial products and risky investments, thereby significantly influencing their risk perception and preferences. In contrast, for urban residents represented in Column (2), mobile payment does not achieve statistical significance. A possible explanation for this finding is that urban residents generally possess higher financial literacy and have better access to traditional financial services; thus, their risk preferences are shaped by various established channels. Consequently, the marginal effect of mobile payment as an isolated factor appears to be relatively limited, failing to demonstrate an independent significant impact.

Columns (3) to (5) of Table 4 present the geographical heterogeneous characteristics of the impact of mobile payment on individual risk preference, and this result can be further explained by combining the reality of China's regional economic development and the theory of the urban-rural digital divide. From the regression results of the western region in Column (3), the estimated coefficient of mobile payment is 0.008, which fails to pass any statistical significance test. This phenomenon is not accidental but is highly related to the reality of the western region's lagging economic development and unbalanced construction of digital infrastructure. Currently, the western region still faces problems such as insufficient coverage of financial services and generally low digital literacy of residents. The urban-rural digital divide restricts the depth of popularization and the expansion of application scenarios of mobile payment, making it difficult to effectively break the

regional barriers of traditional financial services. Furthermore, it cannot form a significant positive impact on residents' risk preference, ultimately showing a weak effect under the background of "insufficient demand".

In contrast, regarding the central region represented by Column (4), the estimated coefficient of mobile payment reaches 0.022, which is highly significant at the 1% statistical level. This is closely related to the economic characteristics of "explosive growth" and the rapid penetration of digital finance in the central region in recent years. As the core area of China's economic growth under the "Rise of Central China" strategy, the central region is in a critical stage of economic structure transformation and financial demand upgrading. Compared with the state of relatively saturated financial markets in the eastern region, the central region has a higher acceptance of new financial tools. At the same time, the catch-up development in the construction of digital infrastructure in the central region has effectively narrowed the urban-rural digital divide, enabling mobile payment to serve as an efficient financial intermediary tool. It significantly changes the traditional risk-averse financial behavior patterns of residents, thereby stimulating individual risk preference more effectively and forming a positive interaction between digital finance empowerment and economic growth.

In contrast, Column (5) reflects data from the eastern region—characterized by its advanced economic development and mature financial market—wherein the coefficient for mobile payment stands at 0.004 and again lacks statistical significance. This finding may indicate that in regions with well-established financial infrastructure, residents' risk preferences are shaped by various mature channels; thus, the marginal contribution of mobile payments appears relatively limited.

Furthermore, as illustrated in Column (6) of Table 4, this study introduces an interaction term between "mobile payment" and "attention to financial information" to explore comprehensively how financial literacy moderates the relationship between mobile payments and individual risk preference. The results reveal that this interaction term has a coefficient of 0.095 and achieves significance at the 1% level. Specifically, among individuals utilizing mobile payments equally, those who exhibit greater attention to financial information demonstrate a heightened stimulation of their risk preferences.

Table 4. Heterogeneity analysis

	(1)	(2)	(3)	(4)	(5)	(6)
	risk	risk	risk	risk	risk	risk
mobel	0.014**	0.004	0.008	0.022***	0.004	0.004
	(0.006)	(0.007)	(0.011)	(0.008)	(0.008)	(0.007)
_cons	0.037	-0.015	0.103	-0.025	-0.019	0.063
	(0.038)	(0.041)	(0.063)	(0.044)	(0.052)	(0.044)
N	16422	10914	5872	8011	9433	18307
F	3.177	0.820	0.788	2.230	2.588	5.583
Control variables	√	√	√	√	√	√
Year fixed	√	√	√	√	√	√
Region fixed	√	√	√	√	√	√
r2_a	0.122	0.079	0.119	0.078	0.106	0.167

5. Conclusions and Suggestions

Based on the three China Household Finance Surveys (CHFS) conducted in 2015, 2017 and 2019, and taking the ownership of smart phones as the proxy variable, this study empirically investigated the impact of mobile payment on individuals' risk preferences. The benchmark regression results show that mobile payment significantly enhances individual risk appetite. After conducting various robustness tests, this core finding remained robust. This promoting effect shows heterogeneity in urban and rural areas, geographical regions. And financial knowledge plays a crucial moderating role in this relationship.

(1) Regulatory frameworks should evolve in tandem with contemporary developments by strengthening transparency supervision and appropriateness management of financial products integrated into mobile payment scenarios. This approach will effectively safeguard the rights and interests of financial consumers.

(2) Both financial education initiatives and policymakers must recognize the importance of financial literacy as a "stabilizer" in the digital era. In promoting digital inclusive finance, national efforts toward enhancing financial literacy education should be prioritized. The public should be guided to develop rational concepts of risk through various channels such as school curricula, community outreach programs, and media campaigns.

(3) When formulating market strategies, it is essential to fully consider potential changes in risk preferences among mobile payment users. Financial products characterized by simple structures, transparent information, and alignment with users' risk tolerance should be offered to achieve a balance between commercial benefits and social responsibilities.

References

[1] Changchit C, Cutshall R, DeLatte G, et al. Exploring personality traits' impact on risk perception in mobile payments [J]. Journal of Computer Information Systems, 2024: 1 - 16.

[2] Belanche D, Guinaliu M, Albas P. Customer adoption of p2p mobile payment systems: The role of perceived risk [J]. Telematics and Informatics, 2022, 72: 101851.

[3] Li J, Di Zheng J. Pro-social preferences and risk aversion with different payment methods: Evidence from the laboratory [J]. International Review of Economics & Finance, 2023, 87: 324 - 337.

[4] Qiu W, Tao H, Wang W. Mobile payment and risky financial market participation: evidence from China [J]. Applied Economics, 2025, 57 (15): 1723 - 1739.

[5] Alrawad M, Lutfi A, Almaiah M A, et al. Examining the influence of trust and perceived risk on customers intention to use NFC mobile payment system [J]. Journal of Open Innovation: Technology, Market, and Complexity, 2023, 9 (2): 100070.

[6] Chen C L, Lai W H. Exploring the impact of perceived risk on user's mobile payment adoption [J]. Review of Integrative Business and Economics Research, 2023, 12 (1): 1 - 20.

[7] Yang W, Wang L, Zhang X. Online or not online: the impact of business owner's risk preference on the adoption of e-business [J]. Electronic Commerce Research, 2025, 25 (3): 1375 - 1394.

[8] Huang S Y, Wang T, Huang Y T, et al. Information security risk items and management practices for mobile payment using non-financial-institution service providers: An exploratory study [J]. International Journal of Accounting Information Systems, 2024, 53: 100684.

[9] Mahler M, Murphy A. Risk of desirable user experiences: insights from those who create, facilitate and accept mobile payments [J]. Electronic Commerce Research, 2024: 1 - 22.

[10] Ramtiyal B, Verma D, Rathore A S. Role of risk perception and situational factors in mobile payment adoption among small vendors in unorganized retail [J]. Electronic Commerce Research, 2024, 24 (4): 2693 - 2731.

[11] Li Genqiang, Gao Xinbo, He Pinglin the Impact of Mobile Internet Accessibility on Family Venture Capital Decisions: An Empirical Study Based on CHFS Data [J] China soft science, 2022, (02): 151 - 162.