

# Analysis of the Influence of Mobile Payment on Consumer Behavior

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**Abstract.** Based on the survey data of 652 samples from 13 provinces in China, this paper analyzes the influence of mobile payment on consumers' consumption behavior and finds that mobile payment stimulates consumers' consumption quantity and willingness to consume luxury goods. The impact of the change of payment methods on consumers' consumption behavior has age and region characteristics. Mobile credit payment induces irrational consumption of the youth. The government should not only support consumers to use new and convenient payment methods, but also guide them to avoid risks of irrational consumption brought by new payment methods.

## 1. Introduction

With the rapid development of mobile intelligent terminals and mobile network communication technology in recent years, mobile payment based on third-party payment has gradually been accepted by people and become the main payment method for people's daily spending. As a link in the process of consumption, the change of payment method will inevitably affect consumers' behavior choice. Researchers all believe that the emergence of non-cash payment changes consumers' behavioral choice. Firstly, the mode of payment changes consumers' purchase intention. Richard Feinberg (1986) believed that the consumption expenditure of consumers using credit cards would be 50-200% higher than that using cash[1]. Runnemark Emma et al. (2015) got the same conclusion in his research[2]. Jianguyi Li and Han Li concluded that every 1% increase of credit card overdraft limit will increase the total consumption by about 0.071% based on the panel data from China Household Finance Survey (CHFS) [3]. Secondly, the mode of payment affects the consumers' consumption structure. Chen Yang et al. (2015) analyzed the effect of payment method on consumers' product preference, and found that consumers who often consume by credit cards preferred products that promote benefits and promote the structure, and while consumers with cash concepts preferred products with prevention benefits and prevention frameworks[4]. Manoj Thomas et al.(2011) studied the payment method of shopping adopted by 1000 families within 6 months, and found that consumers would buy a larger proportion of impulsive unhealthy food when using credit and debit card than using cash payment[5]. However, there are few studies focusing on the influence of mobile payment on consumer behavior choice. The main reasons are as follows. Firstly, mobile payment is a special phenomenon in China, and there are few relevant studies abroad. Secondly, the popularity of mobile payment in China is also something that has happened in recent years. Existing studies mainly focus on the willingness of special groups, such as rural residents and college students, to use mobile payment and its influencing factors. However, when mobile payment is accepted by the public, how this new payment method will affect the consumer's consumption behavior and whether it is different from other non-cash payment methods are worth further discussion. In addition to common variables that affect consumer behavior, such as consumers' income, individual characteristics, family consumption structure, and macroeconomic environment, this paper introduces the variable of payment method and focuses on the impact of mobile payment on consumer's consumption behavior.

Besides the introduction, the structure of this paper is as follows. The second part theoretically analyzes the influence mechanism of mobile payment on consumers' consumption quantity,

consumption structure and consumption psychology preference. The third part designs an analysis model to analyze the impact of mobile payment on consumer behavior choice based on data from a consumer survey. The fourth part is the conclusions and some suggestions.

## **2. Theoretical analysis of the influence mechanism of mobile payment on consumer behavior**

### **2.1 The influence of mobile payment on consumer behavior choice from the perspective of cost**

Consumers are rational economic people who always want to pay the lowest transaction cost when buying goods. James Reardon and Denny Mccorkle(2002) show that the transaction cost is a basic factor for consumers to consider when they consume, which significantly affects consumers' willingness to consume [6]. Compared with other payment methods, the mobile payment has the following cost advantages. The first is the time cost advantage of shopping. Mobile payment makes the integration of online and offline shopping possible. Consumers' shopping is no longer limited by time and region, and the time cost of consumers for shopping is greatly reduced. The second is the payment cost advantage of shopping. Online direct sales save the cost of transportation and counter. Moreover, the network platform based on mobile payment makes it easier for consumers to shop around and buy goods at the best price. The third is the scale cost advantage of shopping. The development of mobile payment promotes the prosperity of network sales. Scale sales are easier to realize, and the costs are further reduced. These three advantages enable consumers to obtain a larger consumer surplus than using other payment methods.

### **2.2 The influence of mobile payment on consumer behavior choice from the perspective of credit**

Richard Thaler (1980) has proposed that people place different sources of funds in different psychological accounts when making consumption decisions, thus influencing consumption choices[7]. Aimei Li et al. (2012) believe that the mode of payment before consumption will make people tend to consume more daily necessities, while the mode of payment after consumption will induce people to consume more luxuries[8]. In order to cater to the consumption habits of young consumers, mobile payment enterprises have successively launched credit services such as Ant Huabei and Jingdong baitiao, which are easier and more convenient to apply for and use than credit cards and other credit services. It has greatly stimulated consumers' desire to buy valuables, caused the differentiation of consumption structure, and increased the consumption of luxury goods.

### **2.3 The influence of mobile payment on consumer behavior choice from the psychological perspective**

The relationship of psychological factors and payment methods can reveal the consumers' psychological changes on consumption behavior when they use different payment methods. Compared with cash payment, mobile payment is a virtual payment process, during which the pain is reduced. Moreover, the third-party payment institutions have developed payment methods such as fingerprint payment, facial payment and code scanning payment, and consumers do not need to enter a password when consuming. They are insensitive to the press of large amount of consumption, which promotes them to purchase more expensive goods.

## **3. Empirical analysis of the influence of mobile payment on consumer behavior choice**

### **3.1 Model**

As shown above, whether from the perspective of cost, credit or psychology, the influence of mobile payment on consumers' consumption behavior is mainly reflected in two aspects: consumption quantity and consumption structure. Therefore, this paper takes consumption quantity and consumption structure as dependent variables to analyze the influence of mobile payment on consumer behavior.

### 3.1.1 The influence of mobile payment on consumers' consumption quantity

The dependent variable is consumers' spending, represented by the consumers' average monthly expenditure ( $C$ , using logarithm). Independent variables are as follows. (i) the consumers' average monthly revenue ( $rev$ , using logarithm). (ii) the consumers' individual characteristics. Three individual characteristics are chosen here, the first is gender ( $m$ , male for 1, and female for 0), the second is the consumers' age ( $age$ ), the third is the consumers' Marital status ( $mar$ , married for 1, otherwise for 0). (iii) payment method. Based on the research purpose of this paper, two variables are set. One is the habit of mobile payment ( $exp$ ). Set one question "Do you often use Alipay or WeChat payment? Please choose one of the answers: ① often, ② more often, ③ generally, ④ less, ⑤ never".  $exp$  equals to 5, 4, 3, 2, 1 if the answer is ①, ②, ③, ④, ⑤ respectively. The other is the habit of credit payment ( $cre$ ), set the question "Do you usually use credit payment, such as credit card, Huabei, Jingdong Baitiao? Please choose one of the answers: ① often, ② more often, ③ generally, ④ less, ⑤ never".  $cre$  equals to 5, 4, 3, 2, 1 if the answer is ①, ②, ③, ④, ⑤ respectively. (iv) family fixed large consumption pressure ( $h$ ). The answer to the question 'Do you need to pay the mortgage?' is selected as variable, which the answer 'Yes' is assigned to the value of 1 while the answer "No" is assigned to the value of 0. (v) the macro environmental factors ( $env$ ) that affect the consumption level. According to the GDP ranking of each province in China in 2018, when the sample lives in Shanghai, Guangdong province, Zhejiang province, Fujian province, Tianjin city and Shandong province,  $env$  is set as "1", while  $env$  is set as "0" for the rest provinces.

$$C = \alpha + \beta_1 rev_i + \beta_2 m_i + \beta_3 age_i + \beta_4 mar_i + \beta_5 exp_i + \beta_6 cre_i + \beta_7 env_i + \beta_8 h + \varepsilon \quad (1)$$

### 3.1.2 The influence of mobile payment on consumers' consumption structure

The consumption structure of consumers is closely related to their consumption tendency. In order to investigate consumers' consumption tendency, a situational question is asked in the questionnaire. The situational question is as follows.

*At present, your monthly income is ¥8,000, and your basic living expenses, such as rent, water, electricity and catering, is about ¥3,500. You will save the rest of your income. When you decide to buy a new laptop, there are two options. You can buy a model A computer with good reputation and price performance which is sold for ¥4500, or you can buy a model B computer whose performance, evaluation and other aspects are better than A model, the original price of ¥9000 is now 30% off on promotion. How likely are you to buy the model B computer? Please choose one of the answers: ① very likely, ② quite possible, ③ general, ④ not likely, ⑤ impossible.*

The probability of respondents buying a model B computer ( $S$ ) is taken as the dependent variable to analyze the influence of independent variables such as income ( $rev$ ), personal characteristics ( $m$ ,  $age$ ,  $mar$ ), payment method ( $exp$ ,  $cre$ ), macro environment ( $env$ ) and family fixed large consumption pressure ( $h$ ) on consumers' consumption structure.

$$S = \alpha + \beta_1 rev_i + \beta_2 m_i + \beta_3 age_i + \beta_4 mar_i + \beta_5 exp_i + \beta_6 cre_i + \beta_7 env_i + \beta_8 h + \varepsilon \quad (2)$$

### 3.1.3 Age characteristics of the influence of mobile payment on consumer behavior

The interaction term of  $age$  and  $exp$  (the habit of mobile payment), the interaction term of  $age$  and  $cre$  (the habit of credit payment) are respectively introduced into model(1) and model(2) to form models (3) - (6) in order to analyze age characteristics of the impact of mobile payment on consumer behavior.

$$C = \alpha + \beta_1 rev_i + \beta_2 m_i + \beta_3 age_i + \beta_4 mar_i + \beta_5 exp_i + \beta_6 cre_i + \beta_7 env_i + \beta_8 h + \beta_9 age_i \times exp_i + \varepsilon \quad (3)$$

$$S = \alpha + \beta_1 rev_i + \beta_2 m_i + \beta_3 age_i + \beta_4 mar_i + \beta_5 exp_i + \beta_6 cre_i + \beta_7 env_i + \beta_8 h + \beta_9 age_i \times exp_i + \varepsilon \quad (4)$$

$$C = \alpha + \beta_1 rev_i + \beta_2 m_i + \beta_3 age_i + \beta_4 mar_i + \beta_5 exp_i + \beta_6 cre_i + \beta_7 env_i + \beta_8 h + \beta_9 age_i \times cre_i + \varepsilon \quad (5)$$

$$S = \alpha + \beta_1 rev_i + \beta_2 m_i + \beta_3 age_i + \beta_4 mar_i + \beta_5 exp_i + \beta_6 cre_i + \beta_7 env_i + \beta_8 h + \beta_9 age_i \times cre_i + \varepsilon \quad (6)$$

### 3.1.4 Gender characteristics of the influence of mobile payment on consumer behavior

The interaction term of  $m$  (gender) and  $exp$  (the habit of mobile payment), the interaction term of  $m$  (gender) and  $cre$  (the habit of credit payment) are respectively introduced into model(1) and model(2) to form models (7) - (10) in order to analyze the gender characteristics of the influence of

mobile payment on consumer behavior.

$$C = \alpha + \beta_1 rev_i + \beta_2 m_i + \beta_3 age_i + \beta_4 mar_i + \beta_5 exp_i + \beta_6 cre_i + \beta_7 env_i + \beta_8 h + \beta_9 m_i \times exp_i + \varepsilon \quad (7)$$

$$S = \alpha + \beta_1 rev_i + \beta_2 m_i + \beta_3 age_i + \beta_4 mar_i + \beta_5 exp_i + \beta_6 cre_i + \beta_7 env_i + \beta_8 h + \beta_9 m_i \times exp_i + \varepsilon \quad (8)$$

$$C = \alpha + \beta_1 rev_i + \beta_2 m_i + \beta_3 age_i + \beta_4 mar_i + \beta_5 exp_i + \beta_6 cre_i + \beta_7 env_i + \beta_8 h + \beta_9 m_i \times cre_i + \varepsilon \quad (9)$$

$$S = \alpha + \beta_1 rev_i + \beta_2 m_i + \beta_3 age_i + \beta_4 mar_i + \beta_5 exp_i + \beta_6 cre_i + \beta_7 env_i + \beta_8 h + \beta_9 m_i \times cre_i + \varepsilon \quad (10)$$

### 3.2 Data

Data were collected by questionnaire. The questionnaire consists of two parts. The first part is the personal information of consumers, such as age, gender, education background, marital status and average monthly income in 2017. The second part is a survey of consumers' consumption habits, which mainly investigates consumers' use of mobile payment and credit payment, as well as a situational question to investigate consumers' consumption tendency towards luxury goods. The questionnaire survey will be conducted from July to October, 2018. The online electronic questionnaire was distributed through WeChat, QQ, Weibo and other social platforms, while Offline paper questionnaires were randomly distributed in the communities. A total of 800 questionnaires were received. After removing the invalid data with obvious logic contradiction, 652 samples were obtained. The samples were distributed in 13 provinces and cities in China, including Shanghai, Guangdong, Zhejiang, Fujian, Tianjin, Shandong, Hubei, Hunan, Jiangxi, Sichuan, Guizhou, Shanxi and Jilin.

Table 1. Statistical characteristics of variables

	C	S	rev	m	age	mar	exp	cre	h	env
mean	0.0832	—	1.0172	—	34.8	—	3.8436	2.7745	—	—
Std.Dev	0.3284	—	0.3946	—	7.8186	—	0.7858	0.9898	—	—

Note: the variables *C* and *rev* is taken as logarithm, and *S*, *m*, *mar*, *h*, *env* are dummy variables.

### 3.3 Empirical results

#### 3.3.1 The influence of payment method on consumption quantity and consumption structure

The results in table 2 show that mobile payment will stimulate consumers' consumption quantity and consumption intention of luxury goods, but credit payment only has a positive impact on consumers' consumption intention of luxury goods, and has no significant impact on consumer spending. Besides, consumers' income is still the main factor that affects consumption quantity and consumption structure. The gender and marital status of consumers influence the consumption structure greatly. Male consumers and unmarried consumers have a stronger willingness to consume luxury goods. Consumer spending increases with age. Family large fixed consumption, such as mortgage, has a positive impact on consumer spending, while has a significant negative impact on consumption structure, which will reduce consumers' consumption of luxury goods. Macro environmental factors also affect a lot on consumer spending. The more developed the economy, the more consumers spend. However, regional economic conditions affect little on consumers' willingness to spend on luxury goods.

Table2. Influence of relevant factors on the consumers' consumption behavior

independent variable	model ( 1 ): dependent variable <i>C</i> ( samples' average monthly spending in 2017 )		model ( 2 ): dependent variable <i>S</i> ( samples' consumption intention )	
	Coefficient	P	Coefficient	P
rev	0.2951***	0.000	2.0626***	0.000
m	0.0251	0.282	0.0426**	0.031
age	0.0087***	0.000	0.0022	0.223
mar	0.0159	0.586	-0.0691***	0.005
exp	0.1040***	0.000	0.0676***	0.000
cre	0.0055	0.771	0.0839***	0.000

h	0.1715***	0.000	-0.1524***	0.000
env	0.1357***	0.000	0.1387	0.492
constant	6.9237***	0.000	0.3519***	0.001
	R-squared=0.5256	Prob>F=0.0000	R-square=0.9382	Prob>F=0.0000

Note: \*P<0.10, \*\*P<0.05, \*\*\*P<0.01, the same below.

### 3.3.2 Age characteristics of the influence of payment method on the consumption quantity and consumption structure of consumers

The interaction term  $age \times exp$  is introduced into models (3) and (4) to analyze the influence of mobile payment on consumers' consumption behavior in different age groups. In table 3, the coefficient and the corresponding P value of  $age \times exp$  in model (3) indicate that using mobile payment is no longer popular with young consumers and mobile payment has a positive effect on promoting the increase of consumption expenditure of middle-aged consumers. In model (4), the coefficient of  $age \times exp$  is negative and significant at 1% level, presenting that mobile payment induces young consumers' luxury consumption intention.

The interaction term  $age \times cre$  is introduced into models (3) and (4) to explore age characteristics of the influence of credit payment. In table 3, the coefficient of  $age \times cre$  in model (5) is positive, which is significant at 1%, indicating that credit payment has been accepted by most consumers and has a general stimulating effect on consumer spending. In model (6), the coefficient of  $age \times cre$  is negative, showing that the credit payment is more favored by young consumers, who satisfy their luxury consumption demand through credit payment.

Table3. Age characteristics of the influence of payment method on consumers' consumption behavior

Independent variable	dependent variable C (samples' average monthly spending in 2017)		dependent variable S (samples' consumption intention)	
	model(3)	model(5)	model(4)	model(6)
	Coefficient (P value)	Coefficient (P value)	Coefficient (P value)	Coefficient (P value)
rev	0.2913*** (0.000)	0.2886*** (0.000)	2.0647*** (0.000)	2.0669*** (0.000)
m	0.0361 (0.110)	0.0326 (0.154)	0.0365* (0.060)	0.0376* (0.053)
age	-0.0347*** (0.000)	-0.0111*** (0.005)	0.0265*** (0.000)	0.0156*** (0.000)
mar	-0.0205 (0.473)	-0.0095 (0.742)	-0.0488** (0.048)	-0.0520** (0.035)
exp	-0.3331*** (0.000)	0.0985*** (0.000)	0.0319*** (0.000)	0.0714*** (0.000)
cre	0.1850 (0.314)	-0.2583*** (0.000)	0.0767*** (0.000)	0.2614*** (0.000)
h	0.1635*** (0.000)	0.1732*** (0.000)	-0.1479*** (0.000)	-0.1535*** (0.000)
env	0.1161*** (0.000)	0.1148*** (0.000)	0.0248 (0.215)	0.0279 (0.166)
$age \times exp$	0.0124*** (0.000)	—	-0.0068** (0.001)	—
$age \times cre$	—	0.0080*** (0.000)	—	-0.0054*** (0.000)
constant	—	—	—	—
	8.5042*** (0.000)	7.6615*** (0.000)	-0.5310** (0.014)	-0.1445 (0.338)
	R-squared=0.4846 Prob>F=0.0000	R-squared=0.4649 Prob>F=0.0000	R-square=0.9402 Prob>F=0.0000	R-squared=0.9401 Prob>F=0.0000

### 3.3.3 Gender characteristics of the influence of payment method on the consumption quantity and consumption structure of consumers

The coefficients of  $m \times exp$  and  $m \times cre$  and their corresponding P values in model (7) to model(10) in table 4 show that there is no gender difference in the impact of mobile payment on consumer spending and consumption structure. In reality, there is no gender difference in the way consumers use mobile payment.

Table4. Gender characteristics of the influence of payment method on consumers' behavior

Independent variable	dependent variable C (samples' average monthly spending in 2017)		dependent variable S (samples' consumption intention)	
	model(7)	model(8)	Model(9)	model(10)
	Coefficient (P value)	Coefficient (P value)	independent variable	Coefficient (P value)
rev	0.2952*** (0.000)	0.2929*** (0.000)	2.0620*** (0.000)	2.0643*** (0.000)
m				

age	0.0394 (0.733)	0.1161* (0.094)	-0.1473 (0.131)	-0.0313 (0.591)
mar	0.0087*** (0.000)	0.0088*** (0.000)	0.0023 (0.212)	0.0021 (0.240)
exp	0.0159 (0.588)	0.0151 (0.607)	-0.0684*** (0.006)	-0.0684*** (0.006)
cre	0.1060*** (0.000)	0.1029*** (0.000)	0.0412* (0.071)	0.0686*** (0.000)
h	0.0055 (0.773)	0.0259 (0.279)	0.0844*** (0.000)	0.0673*** (0.001)
env	0.1712*** (0.000)	0.1694*** (0.000)	-0.1482*** (0.000)	-0.1507*** (0.000)
m×exp	0.1355*** (0.000)	0.1344*** (0.000)	0.0160 (0.429)	0.0149 (0.462)
m×cre	-0.0037 (0.900)	—	0.0494 (0.147)	—
constant	—	-0.0329 (0.163)	—	0.0268 (0.179)
	8.5042*** (0.000)	6.8739*** (0.000)	0.4466*** (0.000)	0.3924*** (0.000)
	R-squared=0.5257 Prob>F=0.0000	R-squared=0.5280 Prob>F=0.0000	R-square=0.9385 Prob>F=0.0000	R-squared=0.9383 Prob>F=0.0000

#### 4. Conclusion

Through the above analysis, it can be concluded that the emergence of mobile payment has a profound impact on consumers' consumption behavior. Firstly, mobile payment stimulates consumers' consumption quantity and consumption intention of luxuries, and the popularity of credit payment strengthens consumers' desire to buy luxury goods. Secondly, the influence of payment method on consumers' consumption behavior has age difference. Mobile payment and credit payment increase the consumption expenditure of the elderly and induce the irrational consumption in advance of the young. Thirdly, the influence of new payment methods on consumers' consumption behaviors shows regional differences. In economically developed regions, mobile payment methods encourage consumers to be more daring to consume in advance. Fourthly, the gender difference of the influence of payment method on the consumption is not obvious. Hence, it is necessary to objectively comment on the impact of mobile payment on consumers' consumption behavior. The government should not only support consumers to use new and convenient payment methods, but also guide them to avoid risks of irrational consumption brought by new payment methods.

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