The influence of electronic payment on household consumption behavior

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Abstract. As a new type of payment method, electronic payment has been rapidly popularized around the world in recent years, and has had a profound impact on household consumption behavior. This paper first analyzes the current situation of electronic payment and household consumption, and expounds the theoretical research of electronic payment on the consumption level and consumption structure, and further tests the influence mechanism of electronic payment on household consumption behavior by using empirical methods. This paper provides a new perspective and thinking for the relationship between electronic payment and household consumption behavior, and provides a useful reference for the formulation of relevant policies.

Keywords: Electronic Payment; Household Consumption; Influence

1 Introduction

With the rapid development of the Internet and mobile payment technology, electronic payment has become an indispensable part of People's Daily life. By 2023, the number of mobile payment users in China has exceeded 940 million, and the transaction scale has exceeded 6,800 trillion yuan, ranking first in the world. Mobile payment is narrowing the gap between the rich and the poor and changing the concept of household consumption. The industrial structure of household consumption is closely related to economic growth. In 2023, the total amount of consumer goods was 47 trillion yuan, up 7.2% year on year. Consumption, which contributes 56% to the economy, has become the primary driving force for economic growth.

Regarding the relevant research on the impact of electronic payment on household consumption, Wang Liping (2022) shows that digital payment method will promote the upgrading of the consumption structure of middle and low income families, but it has no obvious impact on high income families [1]. Gao Junjie (2021) used data model and investigation to find that the gap between urban and rural electronic payment is large and electronic payment has an obvious substitution effect on residents' cash demand[2] . The difference between urban and rural areas will also affect the replacement of electronic payment for residents to carry cash. Yang Weiwei, Zhang Changquan (2020) found that the rapid development of electronic payment has profoundly changed the consumption habits and consumption patterns of Chinese residents [3]. Liu Hu (2020) found that the development of electronic payment has changed the consumption habits of consumers, improved the borrowing constraints of consumers, and increased the consumption tendency. The electronic payment method has brought saved transaction costs and promoted the growth of transaction volume [4]. Song Shiqi (2021) empirically studied that

electronic payment has a direct impact on household consumption, that is, it has a significant effect on promoting household consumption, and electronic payment has a significant impact on increasing the ordinary consumption of households, while the impact on enjoyment consumption is not obvious [5].Zhang Jiaping (2022) The effective measures to promote the consumption of rural residents is a challenge facing developing countries[6]. Thi Minh Ngoc Luu (2021) and other findings demonstrate that perceived ease of use, perceived usefulness, safety, cost, and effort expectations positively affect the willingness of individuals and home retailers to use electronic payments[7]. Luo Xubei (2019) matched a national representative Chinese family tracking survey with county-level e-commerce information obtained from Alibaba, examining how the development of e-commerce has shaped the consumption growth of Chinese families[8]. Brown Martin (2022) pointed out that convenience flexibility is the strongest among young customers. The increase over time coincided with an increase in merchant acceptance [9]. Thomas Lammer (2020) believes that electronic payment provides convenience for the public, and briefly describes some of the risk of electronic payment[10]. Zhou Yushuang (2021) found that mobile payment has greatly improved financial availability and significantly increased the probability of starting a family business[11].

2 Electronic payment and household consumption status quo

2.1 The development status of electronic payment

With the popularity of mobile Internet and the rise of mobile payment, Alipay, WeChat and other payment methods have become daily payment methods. The security and convenience of electronic payment have been continuously improved, the main platforms have strengthened technical support and security guarantee, and the security of users' payment information and funds has been guaranteed. Users can pay anytime and anywhere through mobile APP, websites and other ways to improve the consumption experience.

2.2 Current situation of household consumption

With the development of economy and the constant change of consumer demand, household consumption presents the following characterstics:

First, the scale of consumption is constantly expanding. According to the National Bureau of Statistics, the per capita consumption expenditure was 26,800 yuan in 2023, up 9.2 percent year on year. Among them, the consumption expenditure in catering, housing, transportation, communication, culture and entertainment and other fields all showed different degrees of growth. Second, the consumption structure has been continuously optimized. With the improvement of people's income level and the continuous change of consumption concept, consumers have higher and higher requirements for quality, service and experience, and the consumption structure continues to shift to high-quality and high value-added products and services. Finally, the consumption patterns are constantly being upgraded. With the popularity of mobile payment and the rise of e-commerce platforms, consumers' consumption modes are becoming increasingly diversified, and online consumption and offline consumption gradually tend to balance.

3 Analysis of the influence mechanism of electronic payment and household consumption behavior

3.1 Analysis of the mechanism of electronic payment affecting the consumption level

Electronic payment has had a positive impact on the improvement of residents' consumption level. This is mainly because the electronic payment has the following advantages:

First, electronic payments improve consumption efficiency. Electronic payment is not only convenient and fast, but also can reduce transaction costs. Second, electronic payments have changed people's consumption habits. This change of consumption habits makes consumers more willing to consume, and thus promotes the improvement of the consumption level. Third, electronic payment improves consumer confidence and security. Electronic payment realizes a multi-level security verification mechanism, making the transaction more secure and reliable. These security measures improve consumer confidence and safety, thus enhancing the enthusiasm of consumers.

Based on the above mechanism analysis, the study puts forward the following hypothesis: H1: Electronic payment can promote the improvement of residents' consumption level.

3.2 Mechanism analysis of electronic payment affecting consumption structure

The impact of electronic payment on the consumption structure. It mainly includes the following aspects:

First, electronic payments improve consumers' ability to choose what to spend. Through platforms such as the Internet, consumers can more easily understand the information about goods and services, thus enhancing consumers' ability to choose consumption. Secondly, the electronic payment promotes the upgrading of the consumption structure. More and more consumers begin to pay attention to health, environmental protection, culture and other consumer needs, which makes the consumption structure more diversified and perfect. Third, the electronic payment changes the consumption pattern. Online consumption has greater space and free time, so that consumers pay more attention to personalized and convenient consumption experience.

Based on the above mechanism analysis, this study puts forward the following hypothesis: H2: Electronic payment has a promoting effect on the upgrading of residents' consumption structure.

4 Empirical test of the influence of electronic payment on household consumption behavior

4.1 Model building

This paper studies the influence of electronic payment on household consumption behavior. Starting from the internal mechanism, a multiple linear regression model is constructed with household consumption expenditure as the explained variable and electronic payment as the explanatory variable. The model is used to verify the relationship between the two, and the model is constructed as follows.

$$Y_i=\alpha_0+\alpha_1\text{mobile\_pay}_i+\sum\alpha_iX_i\alpha_i+\varepsilon_i \qquad (1)$$

Where Y represents the household consumption expenditure, mobile payi is the first i electronic payment situation of the family, Xi is the control variable, and ε i is the random interference term.

4.2 Variable declaration

The selected variables will be described in this section, specifically as follows:

4.2.1 Variable being explained

The explained variables in this paper are consumption behavior, including consumption level and consumption structure. Among them, the total household consumption is used to represent the consumption level, and the household Engel's coefficient represents the consumption structure. The China Household Finance Survey Database (CHFS2019) contains statistics on the total household consumption, including food consumption, clothing consumption, housing consumption, household equipment and service consumption, transportation and communication consumption, education, entertainment consumption, health care consumption, other consumption, etc.

4.2.2 Explaining variable

The explanatory variables for electronic payment China family financial survey database (CHFS2019) in the questionnaire dedicated to residents in the process of daily business activities using the shopping way, as long as the choice of the option contains make pay treasure transfer, transfer WeChat, consumers scan merchants qr code (WeChat code, Alipay code, comprehensive qr code, etc.), merchants scan consumer payment code (WeChat payment code, alipay, unipay payment code, etc.) to pay, the electronic payment variable value is 1, otherwise 0.

4.2.3 Control variable

The control variables in this paper include consumer age, gender, education level, marital status, household size, household type, total household income, total household assets, total household liabilities, etc., and considering the unmeasurable differences between regions, the provincial fixed effect was added as the control variable.

The main data of this paper comes from the 2019 China Household Finance Survey of Southwestern University of Finance and Economics (CHFS2019). The 2019 China Household Finance survey sample covered 29 provinces (autonomous regions and municipalities directly under the Central Government), 343 districts and counties, and 1,360 village (neighborhood) committees, and finally collected the information of 34,643 families and 107,008 family members, and the data are representative of the national and provincial levels. The indicators of the explained variables, explanatory variables and control variables are introduced, as shown in Table 1 below.

Table 1 Variable definition table

type of variable	Variable name	variable symbol	Variable interpretation
explained variable	Total household consumption	total_con	Food consumption + clothing consumption + housing consumption + family equipment and service consumption + transportation and communication consumption + education and entertainment consumption + health care consumption + other consumption
explanatory variable	The family Engel coefficient	enge	The proportion of total household food consumption expenditure in household consumption expenditure
	electronic payment	mobile_pay	Use electronic payment as "1" and do not use as "0"
controlled variable	age	age	age
	sex	sex	sex
	educational status	edu	educational status
	marital status	marriage	marital status
	Family size	members	Number of family members
	Household registration type	household	Rural hukou 1, non-agricultural hukou 0
	Household income	total_inc	Wage income + agricultural income + industrial and commercial income + property income + transfer income
	Total family assets	total_ass	Financial assets + non-financial assets
	Total household liabilities	total_deb	Financial assets and liabilities + agricultural liabilities + industrial and commercial liabilities + Housing liabilities shop liabilities + vehicle liabilities + other non-financial assets and liabilities + education liabilities + credit card liabilities + medical liabilities + other liabilities

4.3 Regression analysis

Based on the above analysis content, this chapter analyzes the impact of electronic payment on household consumption level and household consumption structure. It aims to provide a strong reference for various influencing factors. Further deepen the exploration and thinking of electronic payment and develop more feasible suggestions to promote its gradual popularization and rational use. So the following regression analysis was performed. As show in table 2.

Table 2 Results of the regression analysis of electronic payment and consumer behavior

	(1) total_con	(2) enge
mobile_pay	0.201^{***}	-0.015^{***}
	(0.016)	(0.004)
age	-0.002^{***}	0.000
	(0.000)	(0.000)
sex	0.029^{***}	-0.010^{***}
	(0.011)	(0.003)
edu	0.063^{***}	-0.016^{***}
	(0.004)	(0.001)

marriage	0.034***	-0.010***
	(0.006)	(0.002)
members	0.104***	-0.012***
	(0.004)	(0.001)
household	-0.130***	-0.016***
	(0.014)	(0.004)
total_inc	0.108***	-0.008***
	(0.005)	(0.001)
total_ass	0.121***	-0.009***
	(0.005)	(0.001)
total_deb	0.054***	-0.007***
	(0.003)	(0.001)
Province fixed effect	regulate	regulate
_cons	7.268***	0.788***
	(0.071)	(0.018)
N	14690.000	14690.000
r2	0.412	0.126
ar2		
r2_a	0.411	0.123

The empirical analysis of the effect of electronic payment on household consumption expenditure can show that the regression coefficient of electronic payment is 0.201, and the electronic payment and household consumption expenditure are significant at 1%, indicating that electronic payment can promote household consumption expenditure. Similarly, by using the empirical analysis of the impact of electronic payment on household consumption structure, we can find that the regression coefficient of electronic payment is-0.015, and the structure of electronic payment and household consumption is significant at the level of 1%, indicating that electronic payment can promote the upgrading of household consumption structure.

4.4 Analysis of heterogeneity

There are some differences in household consumption expenditure and Engel coefficient between urban and rural areas and regions, so this paper studies the heterogeneity of the influence of electronic payment on household consumption behavior between urban and rural areas based on the characteristics of household type and regional characteristics.

4.4.1 Urban and rural heterogeneity

The whole sample was divided into rural and urban areas according to the type of hukou, analyzing the influence of electronic payment on household consumption behavior in rural and urban areas.

Table 3 Analysis of urban-rural heterogeneity

	consumer expenditure		Engel coefficient	
	town	village	town	village
mobile_pay	0.173***	0.228***	-0.014**	-0.020***
	(0.025)	(0.020)	(0.006)	(0.005)
age	-0.001	-0.004***	0.001***	-0.000

	(1)	(2)	(3)	(4)
	(0.001)	(0.001)	(0.000)	(0.000)
sex	0.021	0.032**	-0.009**	-0.010***
	(0.018)	(0.014)	(0.004)	(0.004)
edu	0.079***	0.047***	-0.017***	-0.013***
	(0.006)	(0.006)	(0.002)	(0.001)
marriage	0.032***	0.035***	-0.014***	-0.008***
	(0.010)	(0.007)	(0.003)	(0.002)
members	0.096***	0.107***	-0.015***	-0.011***
	(0.007)	(0.004)	(0.002)	(0.001)
total_inc	0.110***	0.103***	-0.013***	-0.005***
	(0.008)	(0.006)	(0.002)	(0.001)
total_ass	0.126***	0.116***	-0.011***	-0.008***
	(0.008)	(0.006)	(0.002)	(0.002)
total_deb	0.036***	0.063***	-0.006***	-0.007***
	(0.005)	(0.004)	(0.001)	(0.001)
Province fixed effect	regulate	regulate	regulate	regulate
_cons	7.299***	7.221***	0.858***	0.725***
	(0.114)	(0.086)	(0.029)	(0.022)
N	5375.000	9315.000	5375.000	9315.000
r2	0.386	0.368	0.167	0.113
ar2				
r2_a	0.382	0.366	0.161	0.110

As shown in Table 3, from the perspective of consumer expenditure, electronic payment has a significant promotion effect on both urban and rural household consumer expenditure. However, the magnitude of the regression coefficients can be found where electronic payments promotes greater power in rural areas. This may be because of the poor Internet infrastructure and financial availability in rural areas compared with urban areas, so the mitigation effect of electronic payment on the financial constraints of households in rural areas is more obvious.

From the perspective of Engel coefficient, electronic payment has a significant negative correlation with household Engel coefficient in both urban and rural areas. This suggests that families have easier access to more kinds of goods and services through electronic payment, thus improving their consumption structure and quality of life. However, through the size of the regression coefficient, it can be found that electronic payment has a greater negative impact on the Engel coefficient of households in rural areas, which means that electronic payment can significantly promote the upgrading of the consumption structure of both urban and rural households, but it has a stronger promotion effect on rural areas.

4.4.2 Regional heterogeneity

According to the regional division of China Household Finance Survey Database (CHFS2019), all the samples were divided into four regions: eastern, central, western and northeast, according to the provinces where the family is located, and the differences of the influence of electronic payment on household consumption behavior in different regions were analyzed. As show in table 4.

Table 4 Analysis of regional heterogeneity between electronic payment levels and consumption levels

	eastern total_con	middle part total_con	westward total_con	northeast total_con
mobile_pay	0.211***	0.178***	0.208***	0.196***
	(0.028)	(0.029)	(0.026)	(0.063)
age	-0.003***	-0.003***	-0.002***	0.001
	(0.001)	(0.001)	(0.001)	(0.002)
sex	0.025	0.038*	0.029	0.015
	(0.021)	(0.021)	(0.018)	(0.038)
edu	0.060***	0.067***	0.061***	0.067***
	(0.008)	(0.008)	(0.007)	(0.015)
marriage	0.042***	0.044***	0.030***	0.006
	(0.012)	(0.012)	(0.010)	(0.018)
members	0.079***	0.122***	0.112***	0.138***
	(0.006)	(0.007)	(0.006)	(0.015)
household	-0.148***	-0.073***	-0.182***	-0.016
	(0.026)	(0.028)	(0.022)	(0.045)
total_inc	0.112***	0.135***	0.089***	0.093***
	(0.008)	(0.010)	(0.007)	(0.019)
total_ass	0.128***	0.100***	0.118***	0.146***
	(0.008)	(0.010)	(0.008)	(0.016)
total_deb	0.042***	0.052***	0.072***	0.052***
	(0.005)	(0.005)	(0.005)	(0.010)
Province fixed effect	regulate	regulate	regulate	regulate
_cons	7.464***	7.071***	7.294***	6.834***
	(0.127)	(0.150)	(0.117)	(0.249)
N	4725.000	3671.000	5088.000	1206.000
r2	0.422	0.394	0.362	0.361
ar2				
r2_a	0.419	0.391	0.359	0.355

Table 5 Analysis of the regional heterogeneity of electronic payment and consumption structure

	eastern enge	middle part enge	westward enge	northeast enge
mobile_pay	-0.016**	-0.010	-0.018***	-0.022
	(0.007)	(0.008)	(0.007)	(0.016)
age	0.000	0.000	-0.000	-0.000
	(0.000)	(0.000)	(0.000)	(0.000)
sex	-0.009*	-0.012**	-0.009**	-0.007
	(0.005)	(0.006)	(0.005)	(0.010)
edu	-0.016***	-0.017***	-0.014***	-0.017***
	(0.002)	(0.002)	(0.002)	(0.004)
marriage	-0.014***	-0.012***	-0.005**	-0.007
	(0.003)	(0.003)	(0.003)	(0.005)
members	-0.006***	-0.014***	-0.017***	-0.021***
	(0.002)	(0.002)	(0.002)	(0.004)
household	-0.007	-0.026***	-0.009*	-0.043***
	(0.006)	(0.008)	(0.006)	(0.012)
total_inc	-0.014***	-0.005*	-0.007***	0.008
	(0.002)	(0.003)	(0.002)	(0.005)

total_ass	-0.013***	-0.006**	-0.009***	-0.004
	(0.002)	(0.003)	(0.002)	(0.004)
total_deb	-0.001	-0.008***	-0.013***	-0.003
	(0.001)	(0.001)	(0.001)	(0.003)
Province fixed effect	regulate	regulate	regulate	regulate
_cons	0.824***	0.746***	0.837***	0.511***
	(0.032)	(0.041)	(0.030)	(0.065)
N	4725.000	3671.000	5088.000	1206.000
r2	0.171	0.094	0.140	0.062
r2_a	0.167	0.090	0.137	0.053

Table 4 shows the impact of electronic payment on the household consumption expenditure in the eastern, central, western and northeastern regions. From the perspective of consumption expenditure, electronic payment has a significant effect on the household consumption expenditure in the eastern, central, western and northeast regions, but it can be found from the size of the regression coefficient that it has the biggest effect on the eastern and western regions.

Table 5 shows the impact of electronic payment on the upgrading of household consumption structure in the eastern, central, western and northeast regions. From the point of view of Engel's coefficient, electronic payment has a significant negative correlation between the Engel's coefficient of households in the eastern and western regions. From the perspective of the coefficient, it has the largest negative impact on the western region, indicating that electronic payment can reduce Engel's coefficient and promote the optimization and upgrading of household consumption structure.

5 Conclusions

Electronic payment has become an important part of modern financial services. The empirical study in this paper draws the following conclusions:

Firstly, electronic payment can improve the consumption level of residents and promote the upgrading of the consumption structure. Secondly, electronic payment has a significant effect on promoting household consumption expenditure and consumption structure upgrading between urban and rural areas and regions, and has a greater promoting effect in rural areas. Finally, electronic payment has a significant effect on promoting household consumption expenditure in various regions, among which the eastern and western regions promote the most. At the same time, the electronic payment in the eastern and western regions showed a significant negative correlation with the household Engel coefficient, which had the greatest negative impact on the western region.

References

[1] Wang Liping, Xia Min. The impact of the degree of digitization of payment methods on household consumption ——is based on CHFS data analysis [J]. Economic Management of East China, 2022,36 (07): 87-97.

[2] Gao Junjie. Study on the impact of electronic payment on residents 'cash demand —— Based on the sample survey of residents' consumption payment forms [J]. Prices in China, 2021 (03): 86-89.

[3] Yang Weiwei, Zhang Changquan. Study on the influence of electronic payment on the consumption level of Chinese residents — is based on the VAR model [J]. Journal of Wuhan Business School, 2020,34 (01): 22-26.

[4] Liu Hu. Empirical analysis of the impact of electronic payment on economic growth in China [D]. Shanghai Academy of Social Sciences, 2020.

[5] Song Shiqi. Effect of electronic payment on household consumption behavior [D]. Shandong University, 2021.

[6] Zhang Jiaping,Zhang Huirong,Gong Xiaomei. Mobile payment and rural household consumption: Evidence from China[J]. Telecommunications Policy,2022,46(3).

[7] Thi Minh Ngoc Luu, Phuong Mai Nguyen, Nguyen Nhu Y Ho, Danh Thang Phung. Antecedents of the intention to use electronic payment: evidence from individual and household retailers in Vietnam[J]. International Journal of Electronic Business,2021,16(3).

[8] Luo Xubei,Wang Yue,Zhang Xiaobo. E-Commerce Development and Household Consumption Growth in China[M].The World Bank:2019-04-10.

[9] Brown Martin,Hentschel Nicole,Mettler Hannes,Stix Helmut. The convenience of electronic payments and consumer cash demand[J]. Journal of Monetary Economics,2022,130.

[10] Thomas Lammer. Handbuch E-Money, E-Payment & M-Payment[M].Physica-Verlag HD.

[11] Zhou Yushuang. Study on the impact of mobile payments on family entrepreneurship [D]. Chongqing Technology and Business University, 2021.