Education and the Use of Third-party Payments:
Microcosmic Evidence and Influencing Mechanisms

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Outline

- Related Literature
- Theoretical analysis and research hypothesis
- Research design
- Empirical analysis
- Conclusions

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Theories of Third-party Payments

- Third-party payment means that a third-party platform organization with certain capital and reputation guarantees signs a contract with a bank to provide a credit service between the buyer and seller of goods and services

- The buyer pays for the goods through the account provided by the third-party payment platform. The payment is temporarily stored in the third-party payment platform account. Then the third-party platform informs the seller that the payment has been received and the seller delivers the goods. The buyer receives the goods and confirms the receipt Later, the third-party payment platform will transfer the payment to the seller's account
- Third-party payment is divided into third-party Internet payment and third-party mobile payment according to different payment methods of traders

Related Empirical Studies

- Yang et al. (2016) built a theoretical model of technology adoption (TAM) and found that consumers' personal innovation ability, security and convenience of payment systems are important influencing factors.

- JappelliT & Padula (2013) found that due to the risks of third-party payment such as payment password leakage and data loss, residents who are highly averse to risks are more inclined to use traditional payment methods

- Hu and Zhang (2020) found that residents' financial literacy level has a significant positive impact on their use of WeChat payment, Residents with higher financial literacy are more able to accept new financial services and are more willing to participate

Aims of This Paper

- We examines the impact of residents' education level on their willingness to use third-party payment and substitute Variables are tested for robustness

- We further study the impact of education level on third-party payment satisfaction

- We explore the mechanism by which education level affects the willingness to use third-party payments, and examine the heterogeneous effects of education level on the willingness to use third-party payment in different subsamples.

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Theoretical analysis and research hypothesis

- Zhao(2019) find that the difference in Internet use skills is mainly affected by the individual's education level, although the study did not involve residents' third-party payment behavior, third-party payment is an application scenario of the Internet, and it can be considered that residents' third-party payment behavior may be affected by their own Influence of education level

- **Hypothesis H1**: Education level has a positive impact on the willingness to use third-party payment, that is, the higher the education level of residents, the more likely they are to use third-party payment.

- Education can bring professional knowledge and improve residents' awareness. If users have certain professional knowledge, they can learn how to use this payment tool more easily. After experiencing the convenience brought by third-party payment , Increase satisfaction with third-party payment

- **Hypothesis H2:** The level of education has a positive impact on the satisfaction of third-party payment, that is, the higher the education level of residents, the higher the satisfaction of third-party payment.

Theoretical analysis and research hypothesis

- The education level of residents is positively affecting their use of the Internet. In addition, residents who use the Internet are generally more able to accept new products, so it is easier to understand and master the use of third-party payments.

- **Hypothesis H3:** An increase in education level can increase residents' use of the Internet and further increase residents' willingness to use third-party payments.

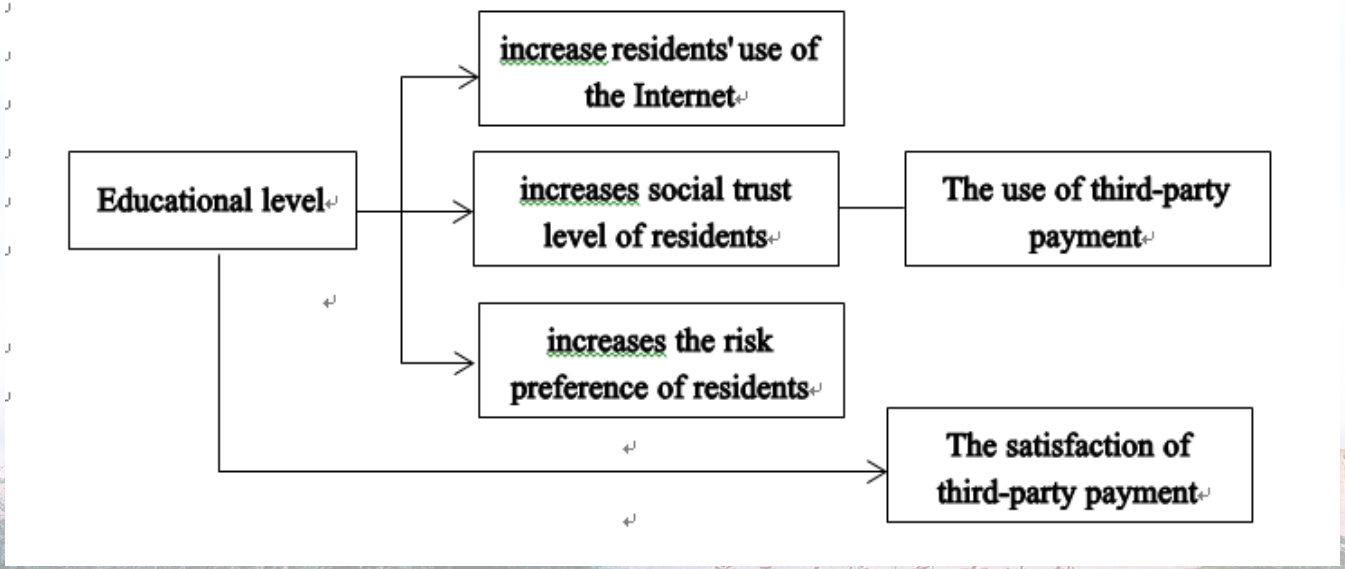
- In network-related transaction services, the degree of trust is an important factor affecting consumer decision-making (Hsu et al, 2014), and research shows that the public's level of education will positively affect its own level of social trust

- **Hypothesis H4:** The improvement of the level of education increases the residents' social trust level, thereby increasing the residents' willingness to use third-party payment.

Theoretical analysis and research hypothesis

- The higher the education level of residents, the greater the degree of risk preference (Dohmen et al, 2011). As a new type of payment method, third-party payment also has risks including the disclosure of payment passwords and loss of payment data. Therefore, residents with high risk aversion are more inclined to use traditional payment methods.

- **Hypothesis H5:** The increase in education level increases the risk preference of residents, which in turn increases the possibility of residents using third-party payment.



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Model setting

$$Payment_i = \alpha_0 + \alpha_1 Education_i + \alpha_2 X_i + \varepsilon_i \qquad (1)$$

- The explained variable $\boldsymbol{Payment_i}$ represents whether the residents use third-party Payment or not. Equal to 1 represents the family uses third-party Payment; otherwise, it is 0. $Education_i$ refers to the Education level of residents, which is reflected by the number of years of education. The value ranges from 0 to 22. $\boldsymbol{X_i}$ refers to the relevant control variable; Error $\boldsymbol{\varepsilon_i \sim N(0, \sigma^2)}$

$$Satisfaction_i = \beta_0 + \beta_1 Education_i + \beta_2 X_i + \varepsilon_i \qquad (2)$$

- Where,$\boldsymbol{Satisfaction_i}$ represents residents' Satisfaction with third-party payment, and the value is 1-5. Other variables have the same meaning as in Equation (1).

Data sources and description of variables

- The data in this article comes from the 2017 China Household Finance Survey (CHFS). CHFS is a large-scale comprehensive survey initiated by Southwestern University of Finance and Economics based on household consumption and investment decisions. In 2017, 40011 households were interviewed and 127012 people were interviewed.

- **Explained variable:** The use of third-party payment(TTPP) The satisfaction of third-party payment(TSPP)

- **Explanatory Variable:** Educational level

- **Other variables:** Age, Gender, Marriage, Politics, Subjective health attitudes, Risk attitude, Social trust, Happiness, Internet use, Annual income

Descriptive statistical analysis

- The following is a descriptive statistical analysis of the variables

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Variable	Sample size	Mean	Standard deviation	Minimum value	Maximum value
The use of third-party payment	22497	0.34	0.47	0	1
The satisfaction of third-party payment	8117	4.07	0.68	1	5
Educational level	22497	9.78	4.04	0	22
Age	22497	52.22	13.16	18	98
Gender	22497	0.80	0.40	0	1
Marriage	22497	0.88	0.38	0	1
Politics	22497	0.09	0.29	0	1
Subjective health attitudes	22497	3.45	1.00	1	5
Risk attitude	22497	1.41	0.67	1	3
Social trust	22497	2.06	0.93	1	5
Happiness	22497	3.84	0.82	1	5
Internet use	22497	0.53	0.50	0	1
Annual income	22497	19688.44	38937.71	0	120000

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Education level and the use of third-party payment

Variable	The use of third-party payment	
	Probit	IV-Probit
	I	II
Educational level	0.017***	0.072***
	(0.001)	(0.004)
Age	-0.006***	-0.008***
	(0.000)	(0.000)
Gender	-0.037***	-0.051***
	(0.006)	(0.011)
Marriage	-0.012***	-0.032***
	(0.008)	(0.013)
Politics	-0.008	-0.097***
	(0.008)	(0.013)
Subjective health attitudes	0.020***	0.014*
	(0.002)	(0.004)
Risk attitude	0.045***	0.053***
	(0.004)	(0.006)
Social trust	0.031***	0.034***
	(0.003)	(0.004)
Happiness	0.006*	0.007
	(0.003)	(0.005)
Internet use	0.267***	0.291***
	(0.005)	(0.012)
Annual income	0.003***	-0.001
	(0.001)	(0.001)
One stage F		1199.05
The t value of the stage 1 tool variable		39.05
Wald Test		104.29
		(0.000)
N	22497	22497

- Column II gives the estimation results based on the two-stage instrumental variable method. The results show that the marginal impact of education level is 0.072, which is significantly positive at the 1% level. The improvement of residents' educational level can increase their willingness to use third-party payment. The F value of the one-stage regression equation is 344.99, and the critical value is 16.38 under the error level greater than 10% (Stock & Yogo, 2005), indicating that the highest level of education among parents is not a weak instrumental variable.

Note:*, **, and *** respectively mean significant at the level of 10%, 5%, and 1%. The marginal effects reported in brackets are all marginal effects, the same below.

Education level and satisfaction with third-party payment

- We only explored the satisfaction of residents who have used third-party payment, and there may be a problem of self-selection of samples.
- Therefore, we will use the Heckman two-step method to modify the original model, and the marginal impact of education level is also positive at the level of 1%. In summary, it can be considered that the improvement of education level has increased residents' satisfaction with third-party payment.

Table 3 estimated results of education level and third-party payment satisfaction

Variable	The satisfaction of third-party payment		
	OLS	2SLS	Heckman
	I	II	III
Educational level	0.010***	0.038***	0.021***
	(0.002)	(0.009)	(0.004)
mills : lambda			0.273*
			(0.091)
Control variables	Control	Control	Control
One stage F		623.60	
The t value of the stage 1 tool variable		25.97	
DWH endogeneity test		11.44	
		(0.001)	
N	8117	8117	22497

Robustness test

- **Use financial knowledge level as a substitute variable for education level**
- The level of financial knowledge has a positive impact on the use of third-party payments at the level of 1%.

Table 4 estimation results of replacement variables of education level

Variable	The use of third-party payment	
	Probit	IV-Probit
	I	II
Financial literacy	0.052***	0.429***
	(0.003)	(0.038)
Control variables	Control	Control
One stage F statistics		297.35
The t value of the stage 1 instrumental variable		17.79
Wald test		127.05
		(0.000)
N	16011	16011

Table 5 the estimated results of the influence of education level on online shopping

Variable	Online shopping	
	Probit	IV-Probit
	I	II
Educational level	0.017***	0.065***
	(0.001)	(0.005)
Control variables	Control	Control
One stage F		1195.49
The t value of the stage 1 instrumental variable		39.06
Wald test		85.92
		(0.000)
N	22446	22446

- **Use online shopping as a proxy variable for third-party payment**
- Education level has a positive impact on online shopping at the 1% level

Analysis of influence mechanism

- **(I) Education level and Internet use**
- A mediation effect model is established based on the method proposed by Wen Zhonglin et al(2014),The specific equation is as follows:

$$Payment_i = \gamma_1 + \gamma_2 Education_i + \varphi X_i + \varepsilon_i \quad (3)$$

$$Internet\_use_i = \delta_1 + \delta_2 Education_i + \varphi X_i + \varepsilon_i \quad (4)$$

$$Payment_i = \alpha_0 + \alpha_1 Education_i + \alpha_2 Internet\_use_i + \varphi X_i + \varepsilon_i \quad (5)$$

Table 6 Increase Internet usage mechanisms

Variable	The use of third-party payment	Internet use	The use of third-party payment
	I	II	III
	IV-Probit	IV-Probit	IV-Probit
Educational level	0.101***	0.130***	0.057***
	(0.004)	(0.004)	(0.004)
Internet use			0.264***
			(0.011)
Control variables	Control	Control	Control
One stage F	1099.91	1099.91	1199.05
The t value of the stage 1 instrumental variable	47.32	47.32	40.72
Wald test	342.18***	457.21	104.59***
	(0.000)	(0.000)	(0.000)
N	22497	22497	22497

At the 1% level of significance, an increase in the level of education can promote Internet use.

Analysis of influence mechanism

- **(II) Educational level and social trust**
- The level of education positively affects the level of social trust at the level of 1%, indicating that the increase in the level of education of residents can increase their level of social trust

Table 7 Mechanism to improve the level of social trust

Variable	Social trust	
	OLS	2SLS
Educational level	0.023***	0.059***
	(0.002)	(0.007)
Control variables	Control	Control
One stage F		1569.51
The t value of the stage 1 tool variable		39.62
DWH endogeneity test		28.37
		(0.000)
N	22497	22497

Analysis of influence mechanism

- **(III) Education level and risk attitude**
- The estimated coefficient of education level in the risk aversion group is negative at the 1% level, while the estimated coefficient of education level in the risk-neutral and risk preference groups is significantly positive

Table 8 Enhance risk appetite mechanism

Variable	Risk aversion	Risk neutral	Risk preference
	I	II	III
	Multinomial Probit		
Educational level	-0.009***	0.005***	0.004***
	(0.001)	(0.001)	(0.001)
Control variables	Control	Control	Control
N	22497	22497	22497

Heterogeneity analysis

- **(I) Analysis of regional location heterogeneity**
- The estimated coefficient of education level in the risk aversion group is negative at the 1% level, while the estimated coefficient of education level in the risk-neutral and risk preference groups is significantly positive

Table 9 Analysis of regional location heterogeneity

Dependent variable:	East	Midland	West
The use of third-party payment	I	II	III
Educational level	0.066***	0.077***	0.072***
	(0.006)	(0.011)	(0.007)
Control variables	Control	Control	Control
One stage F	28.87	1782.93	310.05
The t value of the stage 1 instrumental variable	9.25	40.72	20.96
Wald test	45.90	30.41	52.67
	(0.000)	(0.000)	(0.000)
N	10825	6299	5373

Heterogeneity analysis

- **(II) Heterogeneity analysis of per capita GDP**
- The improvement of education level has a more significant effect on the increase of residents' willingness to use third-party payment in areas with low per capita GDP

Table 10 Analysis on the heterogeneity of GDP per capita

Dependent variable:	High per capita GDP	Low per capita GDP
The use of third-party payment	I	II
Educational level	0.068***	0.074***
	(0.007)	(0.006)
Control variables	Control	Control
One stage F	592.84	589.82
The t value of the stage 1 instrumental variable	29.45	26.10
Wald test	49.28	92.03
	(0.000)	(0.000)
N	10161	12336

Heterogeneity analysis

- **(III) Analysis of regional location heterogeneity**
- The higher the residents' attention to financial information, the more significant the effect of raising the level of education to promote residents' use of third-party payment.

Table 11 Heterogeneity analysis of the degree of financial information attention

Dependent variable:	High attention	Moderate attention	Low attention
The use of third-party payment	I	II	III
Educational level	0.114***	0.076***	0.058***
	(0.016)	(0.011)	(0.005)
Control variables	Control	Control	Control
One stage F	169.51	305.41	610.37
The t value of the stage 1 instrumental variable	13.75	18.78	28.96
Wald test	32.00	19.34	69.73
	(0.000)	(0.000)	(0.000)
N	2408	5027	15024

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Conclusions

- The results show that higher education level can increase the possibility of residents to use third-party payment, and also improve their satisfaction with using third-party payment.

- Further analysis of the influence mechanism implies that the improvement of education level has a positive effect on the use of the third-party payment mainly through three mechanisms: increasing the frequency of using the Internet, improving social trust and increasing the level of risk aversion.

- Our results also suggest that the increase of education level has a more significant effect in central and western China, in regions with low GDP and, for residents with higher attention to financial information.

➢Thank you !

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