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The Roles of FinTech with Perceived Mediators in Consumer Financial Satisfaction with Cashless Payments

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Abstract: The purpose of this paper is to investigate the association between FinTech payments and consumer financial satisfaction with cashless payments using data from the 2017 China Household Finance Survey. This study defines computer payment and mobile terminal payment using a cell phone or pad as payments with FinTech. The results indicate that payments with FinTech are positively associated with financial satisfaction with cashless payments. Furthermore, this result holds in the eastern and central groups of China, but not in the western group, where payments with FinTech are not associated with financial satisfaction with cashless payments. Similarly, the positive association does not hold for consumers with low financial literacy. Moreover, analyses on the mediating effects imply that payments with FinTech play roles through three perceived mediators. Specifically, payments with FinTech help increase consumers' perceived convenience and perceived popularity as well as reduce perceived risk, which eventually improves financial satisfaction with cashless payments. These findings have implications for consumer policymakers, such as improving the development of FinTech, noticing the heterogeneity in terms of location, and guiding consumers to correctly understand the risks associated with FinTech. Surrounding this issue, future studies may also explore other mediators related to psychology and expand the connotation of Fintech from payments with FinTech to lending and portfolio investments with FinTech.

Keywords: FinTech; financial satisfaction; cashless payments; heterogeneity; perceived mediators

MSC: 91G15; 62P05

Citation: Chen, F.; Jiang, G. The Roles of FinTech with Perceived Mediators in Consumer Financial Satisfaction with Cashless Payments. *Mathematics* **2022**, *10*, 3531. https://doi.org/10.3390/math10193531

Academic Editor: Tatiana Filatova

Received: 24 August 2022
Accepted: 26 September 2022
Published: 28 September 2022

1. Introduction

With the development of financial technology (FinTech), technology-driven financial innovation in the fields of payment, settlement, deposit, and loans, cashless payments have broken the restrictions of traditional payment and have become the most convenient payment method [1,2]. Cashless payments refer to the settlement of payment for goods by means other than cash, including bills, credit cards, electronic settlement, and so on. It enables consumers to pay more conveniently, safely, and accessibly, and has been accepted by most countries worldwide [3]. Based on the statistics from the People's Bank of China, in 2021, a total of 439.51 billion cashless payments were handled, with an amount of 4415.56 trillion yuan. Compared to the same period in 2020, the two figures increased by 23.90% and 10.03%, respectively. Similarly, according to the statistics of the Federal Reserve, cashless payment transactions in the United States account for about 80% of all transactions in 2021, with a year-on-year growth rate of more than 14%. Globally, according to Capgemini's Global Payments Report 2021, cash payment volumes fell nearly 16% in 2020, creating the highest rate of decline in the past decade. Figure 1 shows the increasing trend of cashless transactions.

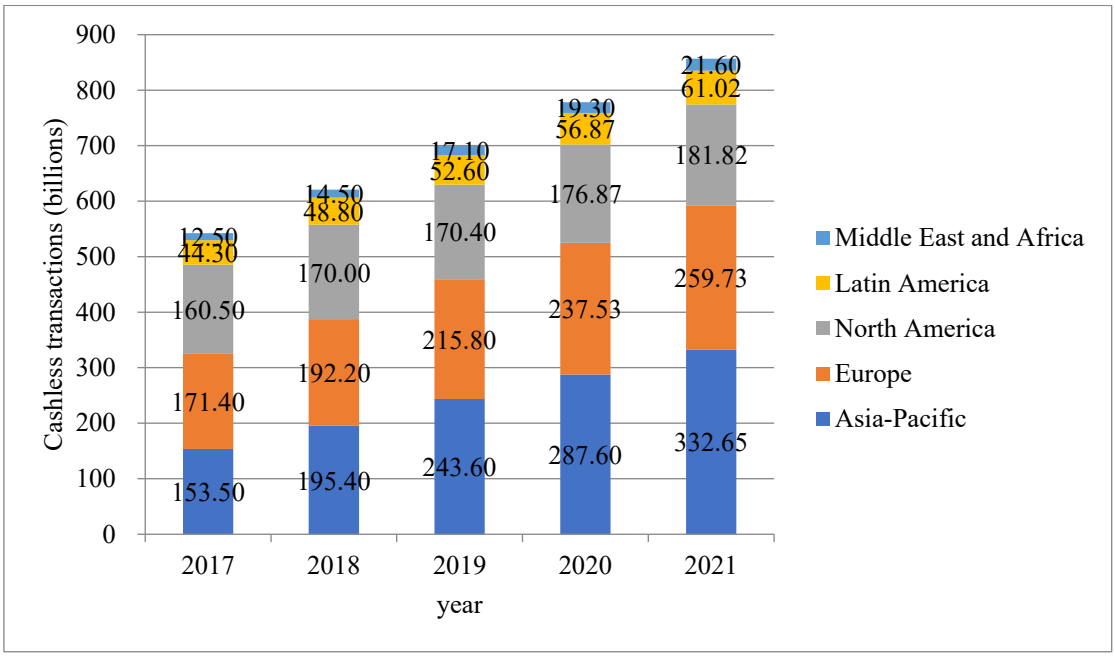

Figure 1. The increasing trend of cashless transactions. Notes: The data in this figure comes from World Payments Report 2020. The data in 2021 is forecasted.

Although cashless payments are widespread, the corresponding satisfaction is not very high among consumers. Based on the Mobile Payment User Report 2020 published by the Payment and Clearing Association of China, 87% of users believe that cashless payment methods, such as mobile payment, have security risks, and 65% think usage scenarios of cashless payments are limited, which shows that there is significant room for improvement in financial satisfaction with cashless payments. Financial satisfaction with cashless payments refers to the psychological feeling of satisfaction or disappointment formed by comparing the perceived results in cashless payments with their expectations [4]. Previous studies have identified many factors affecting this satisfaction from the perspective of technology and individual features. Technological factors affecting this payment satisfaction involve convenience, accessibility, security, and popularity in the process of payment [5]. Furthermore, consumers' acceptance of innovation and understanding of cashless payments are also important factors affecting financial satisfaction with cashless payments [6]. The stronger that consumer awareness of innovation is and the higher the understanding of cashless payments is, the more inclined consumers are to show higher financial satisfaction with cashless payments [7]. Among them, these technological predictors may be improved by FinTech. Improvement in payment technology could also influence consumers' choice of payment methods and eventually enhance their financial wellbeing [8]. Therefore, exploring the association between FinTech and financial satisfaction with cashless payments is of interest for researchers in the field of consumer finance.

This study has the following three objectives, which are beneficial for financial institutions to actively support the development of FinTech, and for consumers to use FinTech to enhance their financial satisfaction with cashless payments:

- To examine the association between FinTech payments and financial satisfaction with cashless payments using data from the China Household Finance Survey (CHFS).
- To explore the heterogeneity of location and objective financial literacy in this context.
- To explore three perceived mediators in the process of payments with FinTech that affect financial satisfaction with cashless payments, namely perceived convenience, perceived popularity, and perceived risk.

To achieve these objectives, this study employs ordered probit regressions to examine the association between FinTech cashless payments and financial satisfaction because the

dependent variable is discrete and ordinal. Instrument variables and Heckman's two-step estimation are also used to alleviate endogeneity problems. To explore the heterogeneity, this study divides the whole sample into subsamples in terms of the two moderators: location and objective financial literacy. Finally, to explore the potential perceived mediators in this process, this study follows the three steps suggested by Baron and Kenny, which are now widely used.

This study makes contributions to the literature in two ways. First, this study explores the perceived mediators taking effects in the process of payments with FinTech that affect financial satisfaction with cashless payments, which is beneficial to comprehensively understanding the various pathways of this process. Financial satisfaction is a subjective conception, which is largely related to perceived factors [9]. However, to the best of our knowledge, no previous research has focused on this. Second, this study involves heterogeneous analyses to investigate whether associations of FinTech payments and financial satisfaction with cashless payments are different in different groups. Specifically, this study mainly explores the heterogeneity in terms of location and objective financial literacy, which will allow policymakers to formulate policies appropriate for the specific situations of different groups.

The rest of the sections of this study are arranged as follows. Section 2 is a literature review and hypotheses development. In this section, this study provides an overview of the literature surrounding FinTech and financial satisfaction. Next, this study establishes the theoretical framework of the relationship between FinTech cashless payments and financial satisfaction and develops hypotheses accordingly. Section 3 is methodology, which aims at the purposes of this study and explains the data, variables, and models used for the empirical analyses. In addition, Section 3 also describes empirical strategies. Section 4 presents empirical results, involving descriptive statistics, benchmark estimations, endogeneity correction, and robustness checks, which supports the first objective of this study. Section 4 also reports the results of heterogeneity analyses, which targets the second objective. Section 5 is the mediation analysis of the three perceived variables, which corresponds to the third objective. Section 6 summarizes the conclusions and limitations of this study and puts forward the implications for policymakers and further directions for future studies accordingly.

2. Literature Review and Hypotheses Development

2.1. FinTech

FinTech uses emerging technologies, such as big data, cloud computing, and blockchain, to improve financial products, financial businesses, and financial services [10]. Generally, it involves many aspects of consumers' financial management, including payments, lending, and portfolio decisions [11]. FinTech also plays an important role in the revolution of financial institutions, regulators, and consumers, which leads to the emergence of non-cash payments [1].

Despite FinTech being an emerging technology, previous studies have noticed that advances in FinTech have mixed effects on consumers' financial wellbeing. Undoubtedly, FinTech tends to benefit consumers by enabling them to control their financial conditions momentarily [11]. Using mobile money, which allows consumers to deposit or transfer money through their smartphones, consumers may allocate consumption more efficiently, thus FinTech can increase per capita consumption [12,13]. In addition, FinTech enables investors with different risk attitudes to manage their financial assets. For risk-averse investors, it lowers the costs of searching for information and seeking professional advice [14]. For risk-loving investors, it transfers venture capital into promising start-ups and small businesses [11].

However, the growth of FinTech may also result in some undesirable consequences. For example, FinTech offers more accessible ways for consumers with poor financial literacy to lend, through peer-to-peer (P2P) lending and so on [11]. These missing qualification reviews, as well as high leverage, can cause the rapid accumulation of financial risks and

crises, which in turn hazards consumers' financial wellbeing [15]. Moreover, FinTech borrowers do not reduce their costs because many lenders charge a high premium. Under this condition, the purpose of Fintech is only to facilitate borrowers [10].

2.2. Financial Satisfaction

Financial satisfaction refers closely to the utility in the domain of finance, including income, payment, and portfolio management [16]. Previous studies indicate that financial satisfaction belongs to specific life satisfaction, and contributes to consumer subjective wellbeing [17–19]. There are many demographic and financial predictors of financial satisfaction. For instance, the former includes income, age, and career [20,21], and the latter involves financial literacy, financial planning, and financial constraints [22,23].

Financial satisfaction with cashless payments is a subjective concept, which measures how the process of payment meets or surpasses customers' expectations [24,25]. Concentrating on financial satisfaction with cashless payments, existing studies find that it mainly depends on technological factors [26]. The advancement of information technology has promoted innovation in cashless payments, where goods and services are traded without the use of physical cash [27]. Therefore, the accessibility to information technology and the security, processing speed, and perceived risk in the payment processes are key factors that affect financial satisfaction with cashless payments [9].

Although previous studies have identified various predictors of financial satisfaction with cashless payments, not enough of the literature focuses on the background of the growth of FinTech. Furthermore, few studies explore the mediators that take effect in the relationship between FinTech and consumer financial satisfaction with cashless payments from the perspective of psychology, which fails to give a comprehensive depiction of this issue. Moreover, the role of FinTech may present heterogeneity according to different digital economic infrastructures and consumers' financial literacy, but existing studies tend to ignore this. This study puts forward the related hypotheses based on theoretical analyses by targeting these gaps in the literature.

2.3. The Relationship between FinTech Cashless Payments and Financial Satisfaction

The development of FinTech has influenced consumers' choice of payment methods and attracted more customers, bringing about a movement of cashless payments [11,28,29]. Previous studies indicate that FinTech is beneficial to consumers in the process of payments, and therefore enhances their financial satisfaction with cashless payments [30]. Thus, H1 is proposed:

Hypothesis 1 (H1). *Payments with FinTech are positively associated with consumers' financial satisfaction with cashless payments.*

The association between FinTech cashless payments and financial satisfaction may present heterogeneity in terms of various factors. This study focuses on location and objective financial literacy. As an emerging technology, the role of FinTech in promoting financial satisfaction with cashless payments needs the support of perfect infrastructure and financial innovation policies [8]. Generally speaking, China can be divided into three parts based on economic development levels: the eastern region, the central region, and the western region. Compared to the higher economic growth rate and more mature financial system in the eastern region, there is still much room for financial development in the central and western regions [31]. Therefore, in the central and western regions, the association between FinTech cashless payments and financial satisfaction is not as significant as that in the eastern region.

Consumers' financial literacy also moderates the association between FinTech cashless payments and financial satisfaction. A consumer with rich financial knowledge tends to have a higher probability of the comprehensive advantage of FinTech [32]. On the contrary, consumers who lack financial knowledge cannot utilize FinTech to optimize their cashless

payments, and may even be exposed to the risks brought by FinTech, which is not conducive to the improvement of financial satisfaction with cashless payments [33]. Therefore, the positive association between FinTech cashless payments and financial satisfaction is more significant among consumers with higher financial literacy. Thus, this study proposes H2:

Hypothesis 2 (H2). *The association between FinTech payments and financial satisfaction with cashless payments is moderated by location and objective financial literacy.*

Possible perceived mediators in the association of FinTech cashless payments and financial satisfaction involve three aspects. The first is perceived convenience. With the support of FinTech, the only thing consumers need to do is to have a mobile phone. This enables the unbanked population to pay anywhere, especially in countries where financial institutions are inadequate [34]. Therefore, payments with FinTech eliminate the usage of money as a medium of exchange for goods and services, which enhances consumers' financial satisfaction [27]. In addition, payments with FinTech enable consumers to have better service in their payment processes and improve their satisfaction [24]. Furthermore, consumers are even willing to pay up to 1.25% extra fees for the convenience and service of FinTech [35].

The second is perceived popularity. FinTech is essentially a technology service with the basic function of helping users manage their wealth, which has a strong sociality [8]. When consumers decide whether to use cashless payments supported by FinTech, they are likely to be affected by external social factors such as fashion, social norms, and interpersonal influence. Perceived popularity refers to consumers' subjective evaluation of the current popularity of a new thing in society [36]. According to the Informational Social Influence Theory, when consumers are in an ambiguous situation or facing a crisis, they often take others around them as the source of information because they are uncertain about what is the correct response and appropriate behavior. They believe that others' interpretations may be more correct than theirs and thus conform their behavior. Therefore, with the growth of FinTech, cashless payments are more and more popular, which promotes consumer perceived popularity. According to the theory of network externality, the value of information technology and innovation to users will increase with the growth of user numbers [37]. When consumers make cashless payments, perceived popularity enhances consumers' financial satisfaction with cashless payments.

The third mediator is perceived risk. The advance of FinTech contributes to the safety of payments. Previous studies hold that FinTech makes full use of big data technology, takes data assets as key production factors, and adopts blockchain technology to achieve the fairness and transparency of data [38]. Therefore, payments with FinTech ensure the security of consumers' private information [34]. Moreover, payments with FinTech guarantee the traceability of payment data, which also reduces the probability of loss and the subjective feeling of undesirable consequences [39]. These two aspects are major sources of perceived risk [40]. Therefore, there is a negative association between FinTech cashless payments and perceived risk. In addition, perceived risk is negatively associated with financial satisfaction with cashless payments [41,42]. Thus, this study proposes H3:

Hypothesis 3 (H3). *Three perceived mediators taking effects in the relationship between FinTech payments and financial satisfaction with cashless payments are perceived convenience, perceived popularity, and perceived risk.*

Based on the research purposes, this study proposes the conceptual framework shown in Figure 2.

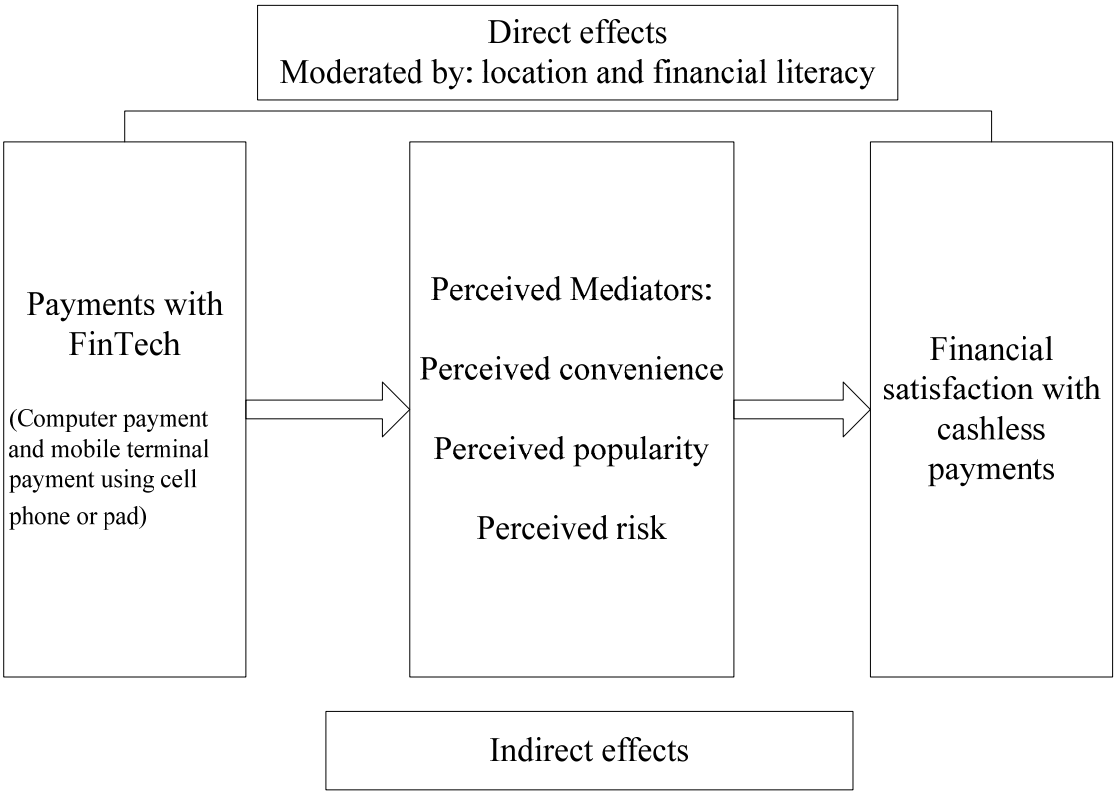

Figure 2. Conceptual framework between FinTech payments and financial satisfaction with cashless payments.

3. Methodology

3.1. Data

The data used in this study are from the 2017 China Household Finance Survey (CHFS), conducted by the Southwestern University of Finance and Economics, Chengdu, China. CHFS aims to collect information on micro-level household finances and carries out comprehensive and detailed descriptions of household economic and financial behavior. The database involves data on household assets, liabilities, income, consumption, insurance, and security, which objectively reflects the basic conditions of Chinese household financial structure and financial behavior. Therefore, CHFS has been used by many published studies [43–45].

This study removed observations with zero or negative values for family total income and total expenditure, respondents with ages younger than 18 years old, and missing values in key variables. The final sample used includes 14,057 observations.

3.2. Variables

3.2.1. The Dependent Variable

The dependent variable is financial satisfaction with cashless payments. This variable is obtained from relevant questions in CHFS, which is "*How does your household asses the non-cash payment services obtained currently?*" Responses range from 1 (Very satisfied) to 5 (Very unsatisfied). For the convenience of interpreting the results, this study reverse-coded the variable to 1 = Very unsatisfied, 5 = Very satisfied.

3.2.2. The Independent Variable

The independent variable is payments with FinTech. The question "*Which of the following payment methods are generally used in your household's shopping (including online shopping)?*" is used to measure whether respondents have made payments with FinTech. If a responding consumer answers "*Computer payment (including E-bank, Alipay, etc)*" or

"*Mobile terminal payment using a cell phone or pad (including Alipay app, Wechat Pay, mobile banking, Apple Pay, etc)*", rather than "*Cash*" *or* "*Cards (including bank cards, credit cards, etc)*", this study considers the consumer as having made payments with FinTech, and then the variable is equal to 1. Otherwise, its value is equal to 0.

Previous studies have argued that FinTech has improved consumers' payments in two aspects, which are digital payments and mobile money [11]. The former refers to payment means that enable consumers to pay with digital technologies instead of conventional methods such as cash and cheque. The latter refers to payment methods with mobile phones. Therefore, this study employs the aforementioned methods to measure whether responding consumers make payments with FinTech.

3.2.3. The Control Variables

Following previous research [45–47], 16 control variables are used: gender, age, age quadratic term, education level, hukou status (Agricultural residence, Non-agricultural residence, or Unified Hukou), marital status, health status, work status, possession of financial assets, credit cards status, digital consumption level, cash amount, family size, income level, expenditure level, and asset level.

3.2.4. Mediators

Three perceived mediators serve to conduct further analyses: perceived convenience, perceived popularity, and perceived risk. Perceived convenience comes from CHFS: "*The operation is troublesome, such as SMS verification, multiple password entry needed?*" If a responding consumer disagrees, they are considered to have perceived convenience. Thus, the variable *perconven* is equal to 1. Otherwise, its value is equal to 0. Perceived popularity (*perpopu*) is measured by the number of consumers who make payments with FinTech in the province where a responding consumer is located. Perceived risk is also from CHFS: "*FinTech is risky and the capital is not secure?*" If consumers answer "Yes", they are assumed to have perceived risk. Therefore, the variable *perrisk* is equal to 1. Otherwise, its value is equal to 0. Specification of variables is shown in Table 1.

Table 1. Specifications of variables.

Type	Label	Meaning	Measurement	Attribute
Dependent variables	*cashless_satis*	Financial satisfaction with cashless payments	"How does your household asses the non-cash payment services obtained currently?"	Range from 1 to 5 (1 = Very unsatisfied, 5 = Very satisfied)
Independent variables	*Fintech_pay*	Whether the responding consumer has payments with FinTech	"Which of the following payment methods are generally used in your household's shopping (including online shopping)?"	1 = computer payment or mobile terminal payment using cell phone or pad, 0 = otherwise
Control variables	*gender*	Gender of the responding consumer	From CHFS directly	1 = male, 0 = female
	age	Age of the responding consumer		
	age^2	The quadratic term of age		
	highschool_ed	The education level of the responding consumer		1 = high school or higher degrees, 0 = otherwise
	urban_hukou	Style of hukou of the responding consumer		1 = non-agricultural residence, 0 = otherwise
	married	Marital status of the responding consumer		1 = married, 0 = otherwise
	health	Health status of the responding consumer		From 1 = very bad to 5 = very good
	work	Whether the responding consumer works		1 = yes, 0 = no
	financial_asset	Does the responding consumer invest in stocks, funds, bonds, and other financial assets		1 = yes, 0 = no
	credit_card	Does the responding consumer have a credit card		1 = yes, 0 = no
	digi_consump	The amount of responding consumer has spent digitally		The unit of measurement is ten thousand Yuan
	cash_amount	The amount of cash that the responding consumer holds		The unit of measurement is ten thousand Yuan
	family_size	Household size		Number
	total_income	The sum of household total income		The unit of measurement is ten thousand Yuan
	total_expenditure	The sum of household total expenditure		The unit of measurement is ten thousand Yuan
	total_asset	The sum of household total asset		The unit of measurement is ten thousand Yuan

Table 1. *Cont.*

Type	Label	Meaning	Measurement	Attribute
Mediating variables	*perconven*	Does the responding consumer have perceived convenience?	"The operation is troublesome, such as SMS verification, multiple password entry needed?"	1 = no, 0 = yes
	perpopu	Does the responding consumer have perceived popularity?	The number of consumers who make payments with FinTech in the province that a responding consumer is located in	Number
	perrisk	Does the responding consumer have perceived risk?	"FinTech is risky and the capital is not secure?"	1 = yes, 0 = no

3.3. Models

To further accomplish its purposes, this study establishes the following econometric models.

$$cashless\_satis_i^* = \alpha_i + \beta Fintech\_pay_i + \sum_{j=1}^{k} \gamma_j CV_{j,i} + \sum_{m=1}^{n} \pi_m region_{m,i} + \varepsilon_i \quad (1)$$

$$\begin{cases} cashless\_satis_i = 1, \; if \; cashless\_satis_i^* \leq \mu_1 \\ cashless\_satis_i = 2, \; if \; \mu_1 < cashless\_satis_i^* \leq \mu_2 \\ cashless\_satis_i = 3, \; if \; \mu_2 < cashless\_satis_i^* \leq \mu_3 \\ cashless\_satis_i = 4, \; if \; \mu_3 < cashless\_satis_i^* \leq \mu_4 \\ cashless\_satis_i = 5, \; if \; cashless\_satis_i^* > \mu_4 \end{cases} \quad (2)$$

Here, $cashless\_satis^*$ represents the latent score of financial satisfaction with cashless payments and *cashless_satis* is the financial satisfaction with cashless payments that are reported by responding consumers. $Fintech\_pay_i$ stands for whether the responding consumers make payments with Fintech. If they have, $Fintech\_pay_i$ is equal to 1. Otherwise, its value is equal to 0. CV represents the 16 control variables. The subscript i represents a responding consumer. This study also controls the heterogeneity between different regions. The study generates a dummy variable for each province, then employs Shanghai as the reference group and adds other dummy variables to the models; *region* stands for the dummy variables representing provinces.

3.4. Empirical Strategies

For benchmark analyses, this study uses ordered probit regressions to examine the association between FinTech payments and financial satisfaction with cashless payments. To alleviate endogeneity problems, this study uses instrument variables and Heckman's two-step estimation. Furthermore, this study divides the whole sample into three subsamples in terms of location and two subsamples in terms of objective financial literacy, to examine whether the association between FinTech payments and financial satisfaction with cashless payments differs between different groups. Finally, to explore the potential perceived mediators in this process, this study follows the three steps suggested by Baron and Kenny [48].

4. Empirical Results

4.1. Descriptive Statistics

Based on Table 2, the average financial satisfaction with cashless payments is 3.9769 (out of 5), which presents a high degree of satisfaction. The percentage of payments with FinTech is 0.8222, which indicates a high penetration rate of FinTech. Of the respondents, 77.71% are men, and 86.59% are married. The average age of the respondents is 46.7735, with the youngest being 18 years old and the oldest being 77 years old. Of the respondents, 40.82% have a high school degree or above, and 49.52% have an urban household hukou. The results indicated that 46.95% of the respondents think that FinTech makes payments more convenient and 38.91% of them think FinTech is risky.

Table 2. Descriptive statistics.

Variable	Obs	Mean	Std. Dev.	Min	Max
cashless_satis	14,057	3.9769	0.8134	1	5
Fintech_pay	14,057	0.8222	0.3824	0	1
gender	14,057	0.7771	0.4162	0	1
age	14,057	46.7735	12.9388	18	77
highschool_ed	14,057	0.4082	0.4915	0	1
urban_hukou	14,057	0.4952	0.5000	0	1
married	14,057	0.8659	0.3408	0	1
health	14,057	3.0134	1.4142	1	5
work	14,057	0.8143	0.3889	0	1
financial_asset	14,057	0.2726	0.4453	0	1
credit_card	14,057	0.4608	0.4985	0	1
digi_consump	14,057	2.1209	4.9471	0	50
cash_amount	14,057	1.8414	5.3995	0	200
family_size	14,057	3.3360	1.2065	1	5
total_income	14,057	7.2961	4.5426	0.0204	34.0093
total_expenditure	14,057	5.5681	2.6184	1.2554	20.8450
total_asset	14,057	98.4983	78.1003	0.7950	526.3654
perconven	14,057	0.4695	0.4991	0	1
perpopu	14,057	560.2104	329.0851	114	1313
perrisk	14,057	0.3891	0.4875	0	1

4.2. Benchmark Estimations

The results of benchmark estimations are presented in Table 3. Columns (1) and (2) show the association between FinTech payments and financial satisfaction with cashless payments using ordered probit regressions because the dependent variable is an ordered variable. Column (1) excludes all control variables, only including the key independent variable: payments with FinTech. Column (2) includes not only the 16 control variables but also the province dummy variables to control the heterogeneity in terms of different provinces. Results show that the coefficient of *Fintech_pay* is significantly positive, which indicates that payments with FinTech are positively associated with financial satisfaction with cashless payments. This finding supports H1.

In addition, the coefficients of control variables are mainly in line with expectations and previous studies. The association between age and financial satisfaction with cashless payments is negative. Elderly people tend to have a low understanding and lack attention to emerging digital technologies, which indicates that they do not know much about the advantages of FinTech [49]. Therefore, the elderly show lower financial satisfaction with cashless payments. Married people also present lower satisfaction. Previous studies indicate that marriage means taking more responsibilities, so the subjective psychology of married people tends to be more stable. A stable and lasting income is important because it can maintain their daily life. Therefore, married people tend to be more risk-averse, which will reduce their financial satisfaction with cashless payments. Furthermore, health status, financial assets, credit card holding, digital consumption, total income, and expenditure all contribute to financial satisfaction with cashless payments [21,22,50,51].

Table 3. Benchmark analyses and endogeneity correction (IV and Heckman's two step estimation).

	(1)	(2)	(3)	(4)
Variables	***cashless_satis***	***cashless_satis***	***cashless_satis***	***cashless_satis***
Fintech_pay	0.2492 ***	0.2486 ***	0.4418 ***	0.5786 ***
	(0.0044)	(0.0044)	(0.1356)	(0.0409)
gender		−0.0311	0.0038	−0.0071
		(0.0244)	(0.0082)	(0.0334)
age		0.0075	0.0006	0.0029
		(0.0048)	(0.0016)	(0.0071)
age^2		−0.0002 ***	−0.0001 **	−0.0000
		(0.0000)	(0.0000)	(0.0001)
highschool_ed		0.0016	0.0121	0.0444 ***
		(0.0237)	(0.0116)	(0.0111)
urban_hukou		0.0328	0.0087 ***	0.0289
		(0.0222)	(0.0032)	(0.0312)
married		−0.0795 **	−0.0279	−0.1346 ***
		(0.0324)	(0.0232)	(0.0440)
health		0.0071 ***	0.0015 ***	0.0096
		(0.0010)	(0.0005)	(0.0098)
work		−0.0259	0.0028	0.0078
		(0.0599)	(0.0174)	(0.0744)
financial_asset		0.0695 ***	0.0021	0.0133 ***
		(0.0231)	(0.0074)	(0.0032)
credit_card		0.0998 ***	0.0081 ***	0.0528 *
		(0.0207)	(0.0028)	(0.0296)
digi_consump		0.0102 ***	0.0108 *	0.0476 ***
		(0.0020)	(0.0063)	(0.0134)
cash_amount		−0.0042	0.0004	0.0028
		(0.0026)	(0.0007)	(0.0026)
family_size		0.0129	0.0024	0.0150
		(0.0081)	(0.0031)	(0.0114)
total_income		0.0073 ***	0.0018 *	0.0106 ***
		(0.0026)	(0.0011)	(0.0037)
total_expenditure		0.0120 ***	0.0018	0.0056
		(0.0043)	(0.0019)	(0.0068)
total_asset		0.0000	−0.0000	−0.0001
		(0.0002)	(0.0001)	(0.0002)
imr				1.4951 ***
				(0.4358)
province dummy	No	Yes	Yes	Yes
Observations	14,057	14,057	14,057	14,057
Log-likelihood	−11,848.4970	−11,648.1340	−43,602.2730	−5536.3779
Pseudo R^2	0.2365	0.2888	0.3984	0.3962
Chi^2	3251.9400	4543.9400	1370.2100	1297.1130

Notes: ***, **, and * stand for the significance level of 1%, 5%, and 10%, respectively. Robust SEs are in parentheses. *province dummy* represents whether adding the province dummy variables; *imr* represents the inverse Mills ratio.

4.3. Endogeneity

The above benchmark estimations may suffer from endogeneity problems. One reason for this is that financial satisfaction with cashless payments may also affect the probability of having payments with FinTech, which suggests a reverse causality. Additionally, although this study was controlled for 16 variables and province heterogeneity, it may still have omitted variables that affect financial satisfaction with cashless payments. To further explore the association between FinTech payments and financial satisfaction with cashless payments, this study employs two methods to correct any potential biases caused by endogeneity.

First, this study utilizes geographical distance from the capital of the consumer's located province to Hangzhou as an instrumental variable of payments with FinTech. This

instrumental variable is related to the endogenous independent variable. Ant Financial Services Group, based in Hangzhou, is the parent company of Alipay, China's largest mobile payment platform, and a leading FinTech development platform globally [52]. Previous studies find that the development degree of FinTech in China presents a spatial agglomeration effect, which varies with the geographical distance from Hangzhou. The farther away from Hangzhou, the more difficult it is to promote FinTech [53]. Conversely, as a geographical variable, the distance from Hangzhou is almost exogenous [54]. Therefore, this instrumental variable satisfies correlation and exogeneity. The result is presented in Column (3) of Table 3. The coefficient of *Fintech_pay* is still significantly positive, which indicates that the association between FinTech payments and financial satisfaction with cashless payments remains positive.

Second, this sample may have a sample selection bias, which is partially the result of non-random sampling. To determine whether sample selection bias exists, this study employs a logit model to estimate the selection function and then determines the inverse Mills ratio using the distribution information of fitted values. Based on Column (4) of Table 3, the inverse Mills ratio is significant, which indicates potential sample selection bias. To alleviate this bias, this study employs Heckman's two-step estimation, adding the inverse Mills ratio into models. As can be seen in Table 3, the coefficient of *Fintech_pay* is still significantly positive, which shows that H1 still holds even after controlling for potential endogeneity.

4.4. Robustness Check

To verify the robustness of the above findings, this study first replaces the independent variable. Based on the Annual Report on China's FinTech Development 2018, this study uses the number of FinTech corporations in the province where a responding consumer is located (represented by *fintechcorp*) to measure the role of FinTech in consumers' payments. This study then re-estimates the above model, as per Column (1), Table 4. Second, this study first excludes the outliers in terms of the 1% and 99% quantiles of the amount that responding consumers spent digitally. This result is presented in Column (2). Finally, this study alleviates the impact of targeted poverty reduction in the same period by excluding some samples. In detail, this study identifies potential poverty reduction targets in terms of CHFS "Is your family the poor household?" If a responding consumer's household is identified as a poor household, this study excludes this observation, as per Column (3). In Table 4, all results from the robustness check remain unchanged. Therefore, having payments with FinTech is positively associated with financial satisfaction with cashless payments.

Table 4. Robustness Checks: Changing the independent variable, excluding outliers, and alleviating the impact of targeted poverty reduction.

	(1)	(2)	(3)
Variables	***cashless_satis***	***cashless_satis***	***cashless_satis***
fintechcorp	0.9169 ***		
	(0.0259)		
Fintech_pay		0.5207 ***	0.4767 ***
		(0.0089)	(0.0054)
gender	−0.0049	−0.0024	0.0305 **
	(0.0328)	(0.0310)	(0.0129)
age	0.0016	0.0010	0.0001
	(0.0068)	(0.0061)	(0.0013)
age^2	−0.0001 **	−0.0001 **	−0.0001 **
	(0.0000)	(0.0000)	(0.0000)
highschool_ed	0.0087	0.0380	−0.0057
	(0.0318)	(0.0295)	(0.0113)
urban_hukou	0.0194	0.0318	0.0627 ***
	(0.0297)	(0.0266)	(0.0124)

Table 4. *Cont.*

	(1)	(2)	(3)
Variables	***cashless_satis***	***cashless_satis***	***cashless_satis***
married	−0.1244 ***	−0.1120 ***	−0.0822 ***
	(0.0420)	(0.0401)	(0.0174)
health	0.0058	0.0080 **	0.0088 ***
	(0.0093)	(0.0037)	(0.0033)
work	0.0233	0.0092	0.0401
	(0.0787)	(0.0695)	(0.0272)
financial_asset	0.0211	0.0294 ***	0.0322 ***
	(0.0310)	(0.0033)	(0.0120)
credit_card	0.0315	0.0216	0.0531 ***
	(0.0282)	(0.0265)	(0.0122)
digi_consump	0.1651 ***	0.1324 ***	0.1239 ***
	(0.0374)	(0.0342)	(0.0197)
cash_amount	0.0027	0.0031 ***	0.0013
	(0.0024)	(0.0011)	(0.0011)
family_size	0.0142	0.0127	0.0221 ***
	(0.0111)	(0.0100)	(0.0050)
total_income	0.0107 ***	0.0098 ***	0.0118 ***
	(0.0036)	(0.0033)	(0.0019)
total_expenditure	0.0011	0.0025	0.0052 **
	(0.0063)	(0.0055)	(0.0022)
total_asset	−0.0002	−0.0002	−0.0002 **
	(0.0002)	(0.0002)	(0.0001)
province dummy	Yes	Yes	Yes
Observations	14,057	13,776	11,364
Log-likelihood	−9668.6082	−10,033.1100	−9938.2230
Pseudo R^2	0.3057	0.3942	0.3960
Chi^2	2357.7500	3661.1700	3864.8030

Notes: *** and ** stand for the significance level of 1% and 5%, respectively. Robust SEs are in parentheses; *province dummy* represents whether adding the province dummy variables.

4.5. Heterogeneity

As hypothesized in Section 2, location and financial literacy may affect the positive association between FinTech payments and financial satisfaction with cashless payments. To explore the heterogeneity caused by location, this study divides the samples based on the financial development situation of consumers' locations. Thus, consumers are divided into three groups: the eastern group (Beijing, Tianjin, Hebei, Liaoning, Shanghai, Jiangsu, Zhejiang, Fujian, Shandong, Guangdong, and Hainan), the central group (Shanxi, Inner Mongolia, Jilin, Heilongjiang, Anhui, Jiangxi, Henan, Hubei, Hunan, and Guangxi), and western group (Sichuan, Guizhou, Yunnan, Tibet, Shaanxi, Chongqing, Gansu, Qinghai, Ningxia, and Xinjiang).

In addition, to examine the heterogeneity in terms of financial literacy, this study first measures consumers' objective financial literacy with eight CHFS questions: "High-yielding projects are usually associated with high risk, do you think this is true?"; "Assuming the annual bank interest rate is 4%, if you deposit 100 yuan for 1 year, what is the principal and interest earned after 1 year?"; "Assuming the annual bank interest rate is 5%, and the inflation rate is 3% a year, if you put 100 yuan in the bank for a year and things you can buy will be (more, constant, or less)?"; "Which do you think is riskier in general, stocks or funds?"; "Which do you think is riskier in general, mainboard stock or Growth Enterprise Market (GEM) stock?"; "Which do you think is riskier in general, a stock-leaning fund or bond-leaning fund?"; "Which do you think is riskier in general, national debt or corporate bonds?"; "Investing in a variety of financial assets is less risky than investing in one financial asset. Do you think this is true?" If a question is correctly answered, the responding consumer receives 1; otherwise, they receive 0. This study then sums up the eight items to measure consumers' objective financial literacy. Similarly, consumers are divided into two groups: the high financial literacy group (whose financial literacy is higher than the average, 3.4674) and the low financial literacy group (whose financial literacy is less than 3.4674).

For heterogeneity in terms of location, results in Columns (1), (2), and (3) of Table 5 show that the positive association between FinTech payments and financial satisfaction is accurate for the eastern region and the central region, but not for the western region. This is because inadequate FinTech infrastructure in the western region prevents consumers from enjoying convenient and safe payments. In this region, there are fewer consumers who make payments with FinTech, which means consumers cannot feel the fun of popular payment methods. The Tianfu FinTech Index Report 2021 is jointly published by the Sichuan Association of FinTech (SCAFT), Southwestern University of Finance and Economics (SWUFE), and the Management Committee of Sichuan Tianfu New Area. In terms of the total index of FinTech development, the eastern region continues to lead by a wide margin, averaging more than twice as many points as the western region. Seven of the top ten provinces are in the eastern region. Sichuan ranks sixth and is the only western province in the top ten. This shows that the gap in FinTech development has become increasingly obvious, and also reflects the lack of FinTech infrastructure construction in the western region, which prevents the improvement effect of FinTech on financial satisfaction with cashless payments.

Table 5. Heterogeneity in terms of location and financial literacy.

	(1)	(2)	(3)	(4)	(5)
Variables	***cashless_satis***	***cashless_satis***	***cashless_satis***	***cashless_satis***	***cashless_satis***
Subgroups	**East Region**	**Central Region**	**West Region**	**High Literacy**	**Low Literacy**
Fintech_pay	0.4645 ***	0.4532 ***	0.0414	0.4786 ***	0.0093
	(0.0270)	(0.0373)	(0.0558)	(0.0721)	(0.0245)
gender	0.0366	−0.0658	−0.0957	0.0693	0.0068
	(0.0435)	(0.0706)	(0.0690)	(0.1117)	(0.0311)
age	0.0062	0.0069	0.0229 *	0.0376	0.0111 *
	(0.0095)	(0.0142)	(0.0139)	(0.0232)	(0.0062)
age^2	−0.0001 **	−0.0001 **	−0.0002	−0.0004 *	−0.0001 **
	(0.0000)	(0.0000)	(0.0001)	(0.0002)	(0.0000)
highschool_ed	0.0149	0.1260 *	0.0287	0.0992	0.0176
	(0.0433)	(0.0657)	(0.0669)	(0.1226)	(0.0294)
urban_hukou	0.0023	0.0975	0.0412 **	0.0420	0.0840 ***
	(0.0396)	(0.0610)	(0.0189)	(0.1098)	(0.0265)
married	−0.1033 *	−0.1845 **	−0.0578	−0.4242 ***	−0.0795 **
	(0.0565)	(0.0879)	(0.0879)	(0.1499)	(0.0400)
health	0.0111 ***	0.0009	0.0080	0.0006	0.0007
	(0.0028)	(0.0198)	(0.0195)	(0.0333)	(0.0086)
work	0.0247	0.1689	0.1207	0.3759	0.0272
	(0.0991)	(0.1548)	(0.1529)	(0.3062)	(0.0685)
financial_asset	−0.0123	0.0069	0.1941 ***	−0.0406	0.0917 ***
	(0.0406)	(0.0706)	(0.0726)	(0.1244)	(0.0283)
credit_card	0.0429	0.0330	0.0867 ***	0.0950 ***	0.1056 ***
	(0.0385)	(0.0583)	(0.0192)	(0.0018)	(0.0261)
digi_consump	0.0277	0.0501 **	0.0442	0.0383 *	0.0297 *
	(0.0181)	(0.0214)	(0.0410)	(0.0197)	(0.0176)
cash_amount	0.0028 ***	0.0129	0.0017	0.0067	0.0022
	(0.0009)	(0.0112)	(0.0068)	(0.0127)	(0.0026)
family_size	0.0205	−0.0118	−0.0081	0.0267	0.0050
	(0.0144)	(0.0257)	(0.0236)	(0.0273)	(0.0106)
total_income	0.0120 ***	0.0172 *	0.0071	0.0407 ***	0.0121 ***
	(0.0045)	(0.0094)	(0.0085)	(0.0086)	(0.0034)
total_expenditure	0.0061	−0.0041	0.0234	−0.0001	0.0046
	(0.0084)	(0.0161)	(0.0155)	(0.0154)	(0.0060)
total_asset	−0.0003	−0.0007	0.0002	−0.0016 ***	0.0001
	(0.0002)	(0.0008)	(0.0008)	(0.0005)	(0.0002)
province dummy	Yes	Yes	Yes	Yes	Yes
Observations	8161	3399	2497	4379	9678
Log-likelihood	−4911.4020	−2004.2171	−644.9147	−2574.8874	−4353.9688
R^2/Pseudo R^2	0.3826	0.4162	0.1233	0.4094	0.1410
Chi^2/F-statistics	556.4400	306.3400	97.7500	211.7900	168.1800

Notes: ***, **, and * stand for the significance level of 1%, 5%, and 10%, respectively. Robust SEs are in parentheses; *province dummy* represents whether adding the province dummy variables.

For heterogeneity based on financial literacy, Columns (4) and (5) in Table 5 indicate that the role of FinTech in enhancing financial satisfaction with cashless payments is not significant in the low financial literacy group, which supports H2. FinTech has put forward higher financial literacy requirements for consumers. Paying with FinTech is convenient and popular, but for consumers with low financial literacy, they cannot avoid potential risks. Based on the Mobile Payment Security Survey Report 2020 released by China UnionPay, Quick Response Code (QR Code) payment users account for up to 85% of users, and approximately 20% of them have made large payments, which is misled by the falsely high rate of return. Similarly, according to the statistics released by the American Public Interest Research Group (PIRG) in April 2021, the number of complaints about digital wallets in the American market reached 970. Through further demographic analysis of this data, PIRG found that 74% of the complainants were consumers lacking financial literacy. These show that consumers with low financial literacy are unable to identify the potential risks in payments with FinTech, and thus the positive association between FinTech payments and financial satisfaction with cashless payments is not significant.

5. Further Analyses: Perceived Mediators

This study used a procedure put forward by Baron and Kenny (1986) to examine three perceived mediators: perceived convenience, perceived popularity, and perceived risk. To empirically test whether the three mediators hold, this study constructs the following three equations:

$$Y = aX + \varepsilon_1 \quad (3)$$

$$M = bX + \varepsilon_2 \quad (4)$$

$$Y = cX + dM + \varepsilon_3 \quad (5)$$

In Equations (4) and (5), Y represents the dependent variables (financial satisfaction with cashless payments), X represents the independent variable (payments with FinTech), and M represents the perceived mediators to be tested (perceived convenience, perceived popularity, and perceived risk).

In Equation (3), the coefficient a indicates the association between the independent variable and the dependent variable. In Equation (4), the coefficient b represents the association between the independent variable and the mediator variables. In Equation (5), if d is significant, then the mediating effect holds. Furthermore, if both c and d are significant, the mediating effect is partial, which indicates that other mediators remain. If c is not significant, the mediating effect is complete, which indicates that the mediator is unique. The results are presented in Table 6.

Column (1) has been proven above, which suggests that there is a positive association between FinTech payments and financial satisfaction with cashless payments. For the first mediator, perceived convenience, Column (2) suggests that payments with FinTech are positively associated with perceived convenience, which indicates that consumers who make payments with FinTech believe that FinTech makes payments more convenient. Column (3) shows that FinTech makes consumers' payments more convenient, and therefore improves their financial satisfaction with cashless payments. In the United States, compared with credit card payments, mobile payments, such as Apple Pay, have not greatly improved the payment experience in offline scenarios. For American consumers, the only difference between payments with a credit card and a mobile phone is that they take a card out of their wallet (for micropayments with credit cards, no password is even required) and a mobile phone out of their pocket. Therefore, even though Apple Pay has become quite popular in the U.S. market, the U.S. mobile payment market still lags far behind China. The basic reason is that the U.S. mobile payment does feel particularly convenient for consumers. However, in China, the credit card system is not perfect, and mobile payment is much more convenient than credit card payment. According to a report published by iResearch Consulting, China's mobile payment scale is nearly 80 times that of the United States in 2021.

Table 6. Perceived Mediators.

Mediator: Perceived Convenience			
Variables	**(1)**	**(2)**	**(3)**
	cashless_satis	***perconven***	***cashless_satis***
Fintech_pay	0.4418 ***	0.1230 ***	0.4498 ***
	(0.1356)	(0.0203)	(0.0182)
perconven			0.2618 ***
			(0.0436)
Control variables	Yes	Yes	Yes
Observations	14,057	14,057	14,057
Pseudo R^2	0.3984	0.2808	0.4031
Mediator: Perceived popularity			
Variables	**(1)**	**(4)**	**(5)**
	cashless_satis	***perpopu***	***cashless_satis***
Fintech_pay	0.4418 ***	0.1896 **	0.4486 ***
	(0.1356)	(0.0806)	(0.0184)
perpopu			0.1221 ***
			(0.0435)
Control variables	Yes	Yes	Yes
Observations	14,057	14,057	14,057
R^2/Pseudo R^2	0.3984	0.1957	0.4159
Mediator: Perceived risk			
Variables	**(1)**	**(6)**	**(7)**
	cashless_satis	***perrisk***	***cashless_satis***
Fintech_pay	0.4418 ***	−0.1186 ***	0.4575 ***
	(0.1356)	(0.0137)	(0.0180)
perrisk			−0.2987 ***
			(0.0342)
Control variables	Yes	Yes	Yes
Observations	14,057	14,057	14,057
Pseudo R^2	0.3984	0.2379	0.4112

Notes: *** and ** stand for the significance level of 1% and 5%, respectively. Robust SEs are in parentheses; *Control variables* represent whether the control variables were added.

For the second mediator, perceived popularity, Column (4) suggests that payments with FinTech are positively associated with perceived popularity. Column (5) shows that payments with FinTech make consumers feel more popular, and therefore enhance their financial satisfaction with cashless payments. For the third mediator, perceived risk, Column (6) suggests that payments with FinTech are negatively associated with perceived risk, which indicates that payments with FinTech decrease consumers' perceived risk and makes them feel safer about their payments. Column (7) shows that payments with FinTech make consumers feel more secure in the process of payments, and therefore increase their financial satisfaction with cashless payments. Furthermore, in Columns (3), (5), and (7) of Table 5, all coefficients of the independent variable are significant, which indicates that the three perceived mediators are partial. Thus, this confirms H3.

6. Conclusions, Limitations, Implications, and Further Directions

6.1. Conclusions

To explore the roles of FinTech in consumer financial satisfaction with cashless payments, this study examines the association of payments with FinTech with financial satisfaction regarding cashless payments using data from the 2017 CHFS. The results indicate that payments with FinTech are positively associated with financial satisfaction with cashless

payments. Furthermore, the aforementioned finding presents heterogeneity in terms of location and financial literacy. For the eastern and the central region, the positive association holds, but for the western region, the association between FinTech payments and financial satisfaction with cashless payments is not significant. Similarly, the positive association only holds for consumers with high financial literacy. Finally, the potential effects of payments with FinTech on financial satisfaction with cashless payments occur through three perceived mediators, namely perceived convenience, perceived popularity, and perceived risk. Results suggest that FinTech may help enhance financial satisfaction with cashless payments by increasing consumers' perceived convenience and popularity and decreasing their perceived risk.

6.2. Limitations

Although this study has comprehensively investigated the topic of FinTech and financial satisfaction with cashless payments, some limitations remain and identifying them will be helpful for further studies. For instance, all three perceived mediators are partial, which indicates that there are still other mediators related to psychology that need to be explored. One possible mediator is perceived environmental responsibility. Consumers tend to be more and more aware of environmental protection. As an important infrastructure for financial consumption, the payment and clearing industry is a key industry to support carbon reduction. Compared with cash payments, the important feature of cashless payments is that they are paperless. Therefore, cashless payments can not only guide the transformation of economic and social structure in a green direction but also enhance the awareness of carbon reduction through the main body of multi-level payment. Finally, consumer satisfaction with cashless payments is improved. Regrettably, there are no related questions in CHFS. Further studies using other databases may focus on this issue.

The second limitation is that payments with FinTech are not the whole connotation of FinTech. FinTech involves three aspects, namely payments, lending, and portfolio investments. Among them, payments with FinTech are the most important function of FinTech, but lending and portfolio investments that take advantage of FinTech also play a role in financial satisfaction. By being limited to the availability of data, this study only focuses on payments with FinTech. Future studies may explore the relationships between lending and portfolio investments with FinTech and consumer financial satisfaction.

The third limitation is that this study fails to evaluate the impacts of COVID-19 on the conclusions we have drawn. The outbreak of COVID-19 since the end of 2019 has changed the financial payment system and also posed impacts on the roles of FinTech on consumer satisfaction. Furthermore, the effects of COVID-19 on FinTech may present heterogeneity in various types of consumers. However, the latest data is the 2019 CHFS, which is still before the outbreak of COVID-19. Therefore, this study cannot conduct comparison analyses surrounding the roles of FinTech on consumer satisfaction before and after the COVID-19 outbreak.

6.3. Implications

There are three implications based on this study's findings. The first is that there is a need to improve the development of FinTech. Based on the results of this study, FinTech plays an important role in consumers' payments and increases financial satisfaction with cashless payments. Therefore, efforts should be made to promote it. Policymakers should increase policy support and create a perfect environment for development. The high-risk nature of FinTech development and application makes government support essential. Specific measures can be taken, such as innovating personnel training mechanisms, encouraging the establishment of FinTech laboratories, and launching special plans for FinTech. Furthermore, consumer policymakers need to improve the penetration of FinTech. Based on this study's findings, perceived popularity is a positive mediator. This indicates that the more FinTech users there are, the stronger the perceived popularity is, which results in higher financial satisfaction with cashless payments. Therefore, policymakers

should also further popularize the application of FinTech, establish more mobile and online financial institutions, and vigorously research and develop online devices to assist financial transactions.

Second, consumer policymakers need to notice the heterogeneity in terms of location. This study finds that, for different location groups, the associations between FinTech payments and financial satisfaction with cashless payments vary. Specifically, promoting FinTech for the eastern and central regions may be more effective to help improve their financial satisfaction with cashless payments, especially with the context of COVID-19. Influenced by COVID-19, the offline payment demand of consumers in regions such as Western China has dropped significantly, and imperfect FinTech cannot support their online payment demands. Therefore, policymakers should make particular policies for these subgroups, rather than making a unified policy to be applied to all groups. Policymakers should also pay more attention to the construction of FinTech infrastructure in the western region. The problem of an unbalanced distribution of FinTech resources is prominent in China, and the western region lags in both the quantity and quality of FinTech enterprises, which weakens the role of FinTech in improving consumers' financial satisfaction with cashless payments. Policymakers should further create a superior ecological environment for FinTech and promote the development of FinTech in the western region.

Third, policies may help guide consumers to correctly understand the risks associated with FinTech. This study shows that perceived risk is a mediator in the process of payments with FinTech affecting financial satisfaction with cashless payments. FinTech reduces potential risk in payments, and thus improves financial satisfaction with cashless payments. However, for consumers with low financial literacy, this effect is insignificant because those consumers cannot figure out various risks in the process of payments with FinTech. In the era of FinTech, financial services are more diversified, but business boundaries are more blurred and the risk situation is more severe. Therefore, increasing financial literacy for those consumers may also enhance their financial satisfaction with cashless payments. Consumer educators should attach importance to the popularization of basic knowledge of FinTech for consumers, encourage the development of corresponding projects, and explore the establishment of a long-term mechanism for FinTech knowledge education. These measures may deepen consumer trust in FinTech through an increased understanding of FinTech services and fully protect consumers by mitigating losses or potential risks. In addition, policymakers should encourage the public sector, as well as private and other stakeholders, to play a more active role in disseminating FinTech information and educating consumers, in particular by implementing FinTech education programs to increase consumer awareness of the nature, specificity, and diversity of FinTech.

6.4. Further Directions

This study also provides three directions for further research. The first is to investigate other mediators such as perceived environmental responsibility in the relationship between FinTech payments and financial satisfaction with cashless payments. If perceived environmental responsibility is available based on mature databases, this direction is of great importance to understanding consumer behavior from the perspective of green consumption.

The second is to expand the connotation of FinTech. Further studies may explore the impact of lending and portfolio investments that take advantage of FinTech on consumers' financial satisfaction. It is helpful to provide support for policymakers to promote FinTech in an all-around way.

The third is to conduct comparison analyses surrounding the roles of FinTech on consumer satisfaction before and after the COVID-19 outbreak. COVID-19 has posed significant impacts on existing financial systems, and the roles of FinTech may be either magnified or reduced according to different groups of consumers. If the datasets that support the comparison analyses are available, further studies may explore the development and popularity of FinTech influenced by COVID-19 and compare the differences between the two periods.

Author Contributions: Conceptualization, F.C.; methodology, F.C. and G.J.; resources, G.J.; data collection, G.J.; writing—original draft preparation, G.J.; writing—review and editing, F.C. and G.J.; supervision, F.C.; project administration, F.C.; funding acquisition, F.C. All authors have read and agreed to the published version of the manuscript.

Funding: This research was funded by Social Science Foundation of the Ministry of Education of China (Grant No. 16YJC790006).

Institutional Review Board Statement: Not applicable.

Informed Consent Statement: Not applicable.

Data Availability Statement: The datasets analyzed for this study can be found in the Survey and Research Center for China Household Finance: https://chfs.swufe.edu.cn/ (accessed on 23 August 2022).

Conflicts of Interest: The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

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