# Comparative Analysis between Digital Finance and Consumption Capacity of Urban and Rural Residents

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**Abstract.** This study empirically investigates the influence of digital finance on the consumption of urban and rural inhabitants using the instrumental variable approach and propensity score matching method based on survey data of Chinese household finance in 2017. The search finds that digital finance has a significant promoting effect on the consumption of Rural and urban dwellers. Digital finance will increase the average household consumption by 24.50%, it will lead to consumption growth by improving the non-agricultural employment level of households and the availability of finance. Further analysis shows that digital finance plays a more obvious role in promoting household consumption of urban and rural residents who are middle and low-income and who participate in Internet financing and online lending, moreover, the consumption growth effect of digital finance was higher than that of traditional credit card use in the same period. The paper's research conclusion is that providing important policy enlightenment for China to expand the coverage of digital finance in rural areas in the new era to drive the consumption development of urban and rural residents.

**Keywords:** Digital finance, Digital transformation of finance, Traditional finance, Urban and rural residents' consumption, Consumption structure.

## 1. Introduction

Financial support is an important factor in improving the consumption welfare of Rural and urban populations. On the one hand, under uncertain conditions, consumption smoothing supported by credit supply has become the main way for urban and rural residents to cope with the solution that income shocks affect consumption. On the other hand, as consumption level is affected by consumption risk sharing, medium, and long-term financial development can play a role and create more basic conditions for consumption risk sharing, thus, the resident average consumption propensity can be increased, ensuring the stability of residents' income and driving the progress and efficiency of regional specialized production In fact, Chinese urban and rural residents face the restriction of financial exclusion for a long time, especially in remote and poor areas, traditional financial services exist a large number of credit blank groups [1-3], potential consumption demand has not been the financial support, this reason is that insufficient agriculture-related credit investigation services and asymmetric information of financial product supply and demand subjects. From the perspective of urban and rural residents' endowments, some studies have pointed out that self-exclusion from traditional finance can be effectively relieved by improving financial knowledge and literacy. With the rapid popularization and development of digital finance, many scholars believe that digital finance is a good way to break the fetters of credit investigation development of "agriculture, rural areas, and farmers", the organic integration of digital finance and "agriculture, rural areas, and farmers" has become an important mothed to practice the socialist rural revitalization path with Chinese characteristics [4-5].

Digital finance has the double attributes of Internet technology and finance, providing a more solid foundation and guarantee for the development of new consumption in the new era. The majority of the literature currently in circulation looked at how digital finance affected overall resident spending, but there are significant variations between urban and rural areas in the findings. Urban residents' consumption is encouraged and their consumption habits are improved more by digital finance [6], but it has little or no impact on rural consumption, this is because the low level of education restricts the urban and rural residents to participate digital finance. Another piont is that digital finance brings

more obvious rural residents consumption growth effect. The transaction scale of third-party payment platforms reflects the development level of digital finance to a large extent, and expanding the scope of Internet payment is conducive to promoting the consumption of rural residents. In the rural areas [7], digital finance focuses on increasing rural consumption formal credit demand rather than survival formal credit demand, which helps to ease household consumption credit constraints and release rural household consumption vitality [8].

This paper examines the impact and mechanisms of action of digital finance on the consumption of urban and rural residents based on survey data of Chinese household finances. It also discusses the heterogeneity of digital finance on urban and rural residents' consumption from the perspective of individual differences between urban and rural residents, differences in digital finance use, and comparative analysis with traditional financial use, which aids in understanding the inherent advantages and inclusive value of digital inclusive finance on urban and rural residents' livelihoods [9-10].

## 2. Theoretical Analysis

### 2.1. The Direct Impact of Digital Finance on Urban and Rural Residents' Consumption

Digital finance has a more direct influence on rural residents' consumption. First, digital payment may have an impact on the inherent “psychological account” of rural consumers and accelerate the consumption decision-making of urban and rural residents. Compared with urban consumers, rural consumers have the more smooth willingness and lower consumption ability, which leads to stronger non-substitution between their psychological accounts. Digital payment reduces the transparency and visibility of capital outflow, weakens the psychological loss of cash payment of urban and rural residents, leading to the increase of unplanned purchases and debts, and changes the marginal propensity to consume, thus affecting their consumption. Second, digital payment promotes the transformation of consumption patterns and brings consumption diversity and transaction convenience to urban and rural residents. Compared with urban and rural residents who do not use Internet payment, the implementation probability of online shopping for urban and rural residents who use Internet payment is 33.41% higher than the former. Third, from the consumption type selection, digital finance broadens the channels for urban and rural residents to participate in the financial market, lowers the threshold for participation in digital financial services, and expands the ratio of urban and rural residents’ consumption of financial products. Therefore, the consumption of financial products is a broad field for urban and rural residents to seek new consumption breakthroughs and realize the upgrading of new consumption structures. When urban and rural residents use digital finance, they can have extra access to more financial investment channels and increase the proportional allocation of risky financial assets such as stocks, funds, and securities. This can stimulate the financial consumption demand of urban and rural residents and further extend the improvement of consumption quantity to consumption quality. To sum up, following the deepening of the popularity and use of digital finance in rural areas, the consumption-driving mechanism of rural residents tends to be diversified and the consumer products are rich and diverse, which will promote the consumption expenditure of urban and rural residents and promote the significant change of consumption structure [11].

Assumption 1: Digital finance can boost consumer spending in urban and rural areas.

### 2.2. Indirect influence of digital finance on consumption of urban and rural residents

According to the consumption theory, the consumption ability and marginal propensity of residents are the main reasons that affect consumption expenditure. Based on theory and literature, this paper analyzes the impact of digital finance on urban and rural residents' consumption through its indirect effects on non-agricultural employment and financial availability.

Digital finance promotes non-farm employment. On the one hand, the high-quality non-agricultural employment and entrepreneurship brought by digital finance increase income that can

enhance the consumption power of urban and rural residents and improve the quality of consumption. In terms of expanding non-agricultural employment opportunities, rural family members have the opportunity to obtain real-time employment information provided by big data platforms through the in-depth use of digital finance, so that urban and rural residents have a higher level of non-agricultural employment and have a greater positive impact on household consumption. The marginal propensity to consume of self-employed migrant workers was 0.06 higher than that of employed migrant workers, which would increase the per capital consumption expenditure of households by 14.85% ~ 15.84% and the consumption rate by 17.42% ~ 18.21%. In terms of promoting entrepreneurship, the in-depth use of digital finance improves the availability of information and financial services for urban and rural residents, through multiple channels, promotes entrepreneurial financing for urban and rural residents, stimulates their entrepreneurial enthusiasm, and improves entrepreneurial probability and performance. It is Indirect for the upgrading of household consumption structure to provide stable and higher income accumulation. On the other hand, the change of the different income sources structure may have an impact on marginal propensity to consume. Hence, the use of digital finance has the impact of promoting non-agricultural employment when the non-agricultural employment of urban and rural populations is insufficient. Urban and rural populations will take the initiative to boost consumption as a result of the rise in income and marginal propensity to consume [12].

Assumption 2: Digital finance can positively affect the consumption of urban and rural residents by increasing the level of non-agricultural employment.

Due to the existence of dual financial structure, the development of agriculture-related online lending is unbalanced and inadequate, and the resulting financial constraints lead to differentiated rural household consumption behaviors. Digital finance has a positive impact on the availability of both formal and informal credit for urban and rural residents, thus providing double support for consumer credit for urban and rural residents. On the one hand, digital finance increases the consumption-type formal credit demand of urban and rural residents compared with households that did not use digital finance, households that used digital finance significantly reduced the11.0% household credit constraint. Digital finance can provide a variety of credit products. At the same time, digital finance is a beneficial supplement to rural informal credit, which may increase the difficulty of obtaining private credit for rural households, thus creating space for expanding the demand for Internet credit. Therefore, digital finance can promote the healthy development of formal and informal finance in multiple dimensions, and improve the financial availability of urban and rural residents excluded by traditional finance, so that serves and optimizes the consumption behavior decision-making of urban and rural residents to meet the diversified consumption needs of urban and rural residents.

## 3. Model setting and variable description

### 3.1. Model setting

In order to investigate the impact of the use of digital finance on the consumption of urban and rural residents, this paper sets the following econometric model:

$$\mathrm{LnConsumption}i = \alpha + \beta \mathrm{DigiFin}i + \gamma \mathrm{Control}i + \mu j + \varepsilon i \quad (1)$$

$$\mathrm{LnConsumption}i = \alpha + \beta \mathrm{DigiFin_degree}i + \gamma \mathrm{Control}i + \mu j + \varepsilon i \quad (2)$$

Including, consumptioni is total consumption of the I-th rural and urban population, logarithm. The core explanatory variable is whether urban and rural residents use digital finance DigiFini. If urban and rural residents use digital finance DigiFini=1, otherwise DigiFini=0. DigiFin_degreei indicates the degree of digital finance use. Controli is the control variable, including household head personal characteristics variable, family demographic structure variable and economic characteristics variable, $\alpha,\beta,\gamma$ are the parameters to be estimated, $\mu j$ is the provincial fixed effect, $\varepsilon i$ is the random error term.

To effectively reduce the bias of sample estimation caused by "self-selection", a lot of Propensity Score-Matched (PSM) method was used for estimation.

### 3.2. Data sources

China Household Finance Survey (CHFS) collects micro-data on household finance, including assets and liabilities, income, and consumption, payment habits and employment, providing sufficient data support for investigating the impact of digital finance on urban and rural residents' consumption.

### 3.3. Variable description

#### 3.3.1. Explanatory variables.

This paper examines the use of digital finance by urban and rural residents from three dimensions. First, the use of third-party payment products. Second, the use of Internet financial products. Third, online lending participation.

#### 3.3.2. Explained variables.

The variable being addressed in this essay is the total consumption of urban and rural populations, which includes total spending on food and clothes, housing, daily necessities, communication, transportation, and leisure activities. Table 1 displays the outcomes of group descriptive statistics. This suggests that as the use of digital finance grows, so will the total amount of money that urban and rural residents spend on consumption, leading to a greater effect on consumption growth. This suggests that there is a positive correlation between the use of digital finance and the consumption of urban and rural residents.

**Table 1.** Use of digital finance and Total Consumption Expenditure of urban and rural residents (Yuan).

| Type | Use digital finance | Not used Digital finance | Digital Financial Use = Class 1 | Digital Financial Use > Class 1 |
|---|---|---|---|---|
| Total consumption of urban and rural residents | 65539.19 | 31040.94 | 62411.21 | 88706.66 |

### 3.4. Control Variables.

Referring to the existing literature, the control variables selected in this paper include three categories, which are household head characteristics, family population characteristics, and family economic characteristics. In terms of sample screening, the regional questionnaire, family questionnaire, and personal questionnaire database were matched, and then the samples whose household head was less than 16 years old, consumption was more than 5 times of income, total income or total assets were less than 100 yuan, and there were missing values and outliers were excluded. Finally, the samples of 8019 urban and rural residents were retained.

## 4. Empirical Results and Analysis

### 4.1. Analysis of the Impact of Digital Finance on Consumption of Urban and Rural Residents

The $R^2$ of the models in columns (1) and (2) in Table 2 are 50.75% and 50.73%, it indicates that the chosen independent variable has some capacity to explain the dependent variable. The influence coefficient of digital finance use on the total consumption expenditure of urban and rural residents is significantly positive at the 1% level, according to the regression results in column (1), after controlling the variables of household head characteristics and family characteristics. This means that under the influence of digital finance, the total consumption expenditure of urban and rural residents using digital finance is 24.50% higher than that of urban residents. According to the anticipated coefficient of the degree of use of digital finance in column (2), which is similarly considerably positive at the 1% level, residents of urban and rural areas with high levels of use will experience a

22.37% rise in consumption compared to those with low levels of use. The policy implication of the aforementioned findings is that raising the penetration rate of digital finance in rural areas, raising the participation rate of digital finance among urban and rural residents, and emphasizing the effect of digital finance on the marginal propensity to consume of urban and rural residents will all be favorable to raising consumption expenditures of urban and rural residents. As a result, assumption 1 is proven.

**Table 2.** Regression results of the influence of digital finance on consumption of urban and rural residents.

| variate | Total consumption expenditure of urban and rural residents | | | | Use of digital finance |
|---|---|---|---|---|---|
| | -1 | -2 | -3 | -4 | -5 |
| Use of digital finance | 0.2450*** | | 0.7692*** | | |
| | -0.0208 | | -0.1265 | | |
| Degree of use of digital finance | | 0.2237*** | | 0.7105*** | |
| | | -0.0176 | | -0.1115 | |
| Schooling | 0.0168*** | 0.0164*** | 0.0142*** | 0.0131*** | 0.0049*** |
| | -0.0022 | -0.0023 | -0.0024 | -0.0025 | -0.0011 |
| Marital status | 0.1956*** | 0.1956*** | 0.2015*** | 0.2027*** | -0.0112 |
| | -0.0246 | -0.0248 | -0.025 | -0.0253 | -0.0103 |
| Family members | 0.1545*** | 0.1546*** | 0.1443*** | 0.1428*** | 0.0195*** |
| | -0.0058 | -0.0058 | -0.0064 | -0.0066 | -0.0032 |
| Proportion of family labor force | 0.0986*** | 0.0991*** | 0.0715** | 0.0705** | 0.0520*** |
| | -0.0324 | -0.0328 | -0.0336 | -0.0341 | -0.0133 |
| Household debt ratio | -0.0016*** | -0.0016*** | -0.0014*** | -0.0016*** | -0.0001 |
| | -0.0004 | -0.0004 | -0.0004 | -0.0004 | -0.0002 |
| Housing situation | 0.0201 | 0.0202 | 0.0373 | 0.0373 | -0.0325** |
| | -0.0332 | -0.0337 | -0.0343 | -0.0351 | -0.0136 |
| Provincial fixed effect | Yes | Yes | Yes | Yes | Yes |
| N | 0.8019 | 0.7816 | 0.8019 | 0.7816 | 0.8019 |
| R2 | 0.5075 | 0.5073 | 0.4726 | 0.465 | 0.1738 |

Note: *, ** and *** are significant at the level of 10%, 5% and 1% respectively; Robust standard error adjusted for heteroscedasticity in parentheses. The same in the following table

## 4.2. Mechanism test of the influence of digital finance on consumption of urban and rural residents

### 4.2.1. Optimize the information environment and promote non-agricultural employment.

Based on the consideration of the impact of the level of non-agricultural employment, this paper studies whether the effect of digital finance on the consumption of urban and rural residents is more obvious for urban and rural residents with low non-agricultural employment level.

The non-agricultural labor force is defined in this paper based on data from CHFS2017 as urban and rural residents whose family members are employed in non-agricultural industries or industries and whose employment time exceeded six months in the previous year. The sum of these numbers represents the non-agricultural employment level of urban and rural residents. For testing, the model includes the cross terms of digital finance use, degree of use of digital finance, and degree of non-agricultural employment.

### 4.2.2. Reduce transaction costs and improve financial availability.

Urban and rural residents have obvious characteristics of credit information lag. If digital finance will lower the credit threshold, and expand the availability of consumer finance to promote consumption, then compared with urban and rural residents with a high capital endowment, urban

and rural residents of vulnerable groups, because of their difficulties in effectively meeting the mandatory requirements of mortgage guarantee and information asymmetry, and so on, they have been affected by the "loan reluctance" of traditional financial institutions for a long time .but they should benefit more from digital finance. This paper will consider the quantity of different traditional finance to identify whether digital finance has a greater impact on the consumption of urban and rural residents who are constrained by traditional finance.

The number of bank savings cards or current passbooks opened by urban and rural residents is used in the empirical study as a proxy for financial availability. Additionally, the cross-term of digital finance use, the degree of use of digital finance, and financial availability are introduced into the model for two-stage least squares estimation. The coefficients of the two cross terms in columns (3) and (4) in Table 3 are -19.19% and -16.98%, respectively, and both are significant. This demonstrates that the usage of digital finance by urban and rural residents has a more significant promotion effect on the total household consumption spending when the financial availability of urban and rural people is weak.

**Table 3.** Test results of the mechanism that the use of digital finance affects the consumption of urban and rural residents.

| Variate | Total consumption expenditure of urban and rural residents | | | |
|---|---|---|---|---|
| | -1 | -2 | -3 | -4 |
| Use of digital finance | 1.3303*** | | 1.7185*** | |
| | -0.1763 | | -0.2416 | |
| Degree of use of digital finance | | 1.2204*** | | 1.5502*** |
| | | -0.1529 | | -0.2045 |
| Digital finance uses x non-farm employment | -0.2628*** | | | |
| | -0.0982 | | | |
| Financial availability | | | 0.0605*** | 0.0576*** |
| | | | -0.0162 | -0.0162 |
| Use degree of digital finance × availability of finance | | | | -0.1698*** |
| | | | | -0.0353 |
| Control variable | Yes | Yes | Yes | Yes |
| N | 0.8019 | 0.7816 | 0.7607 | 0.7418 |
| R2 | 0.3933 | 0.3798 | 0.3706 | 0.3615 |

## 5. Robustness test

### 5.1. Use different instrumental variables

This paper selects whether urban and rural residents own computers and whether they own smartphones as instrumental variables for the use of digital finance. The results in Table 4 show that the DWH test results are significant, which does not reject the null hypothesis that the use of digital finance is an endogenous variable. The first-stage F value is greater than 16, which also indicates that the instrument variable does not have the problem of a weak instrumental variable. Therefore, instrumental variables are feasible and effective. The 2SLS estimation by replacing the instrumental variable shows that the use of digital finance still has a significant role in promoting the consumption of urban and rural residents, indicating that the estimation results above are robust. The approximate zero approaches (LTZ) offers a workable way to further confirm the accuracy of the instrumental variables in this study. The robustness of the foregoing findings is further supported by the LTZ regression estimate results, which also demonstrate that the usage of digital finance considerably encourages the increase of consumption among urban and rural inhabitants when the instrumental variable is roughly exogenous.

**Table 4.** Robustness Test 1: Different instrumental variables.

| Variate | Total consumption expenditure of urban and rural residents | | | | | |
|---|---|---|---|---|---|---|
| | IV: Whether there is a computer | IV: Whether there is a computer | IV: Whether there is a smart phone | IV: Whether there is a smart phone | LTZ | LTZ |
| | -1 | -2 | -3 | -4 | -5 | -6 |
| Degree of use of digital finance | | 1.0587*** | | 5.4733*** | | 0.9316*** |
| | | -0.1102 | | -0.9672 | | -0.0924 |
| Control variable | Yes | Yes | Yes | Yes | Yes | Yes |
| Provincial fixed effect | Yes | Yes | Yes | Yes | | |
| N | 0.8019 | 0.7816 | 0.8019 | 0.7816 | 0.8019 | 0.7816 |
| F in stage one | 29.15 | 26.39 | 28.55 | 26.08 | | |
| Tool variable t value | 14.2 | 14.32 | 6.94 | 6.18 | | |
| DWH test Chi2 | 91.7084 | 82.3602 | 130.473 | 122.789 | | |
| P | 0 | 0 | 0 | 0 | | |

## 5.2. Replacing explained variables

The consumption patterns of households can provide a more thorough reflection of the capital distribution of urban and rural residents' consumption in terms of total household income. The average propensity to consume (APC) and the regression results of instrumental factors are shown in Table 5 together with the regression results of substituting the total consumption expenditure of urban and rural people. The findings demonstrate that, using the usage of digital finance as an example, the estimated coefficients of OLS regression in column (1) and 2SLS regression in column (2) have a mild drop and both are significant at the 1% level. After replacing the core explanatory variable with the degree of digital finance usage, the above results are still robust.

**Table 5.** Robustness test 2: different explained variables.

| Variate | Average consumption propensity of urban and rural residents(APC) | | | |
|---|---|---|---|---|
| | -1 | -2 | -3 | -4 |
| Use of digital finance | 0.2133*** | 0.6691*** | | |
| | -0.0244 | -0.1587 | | |
| Degree of use of digital finance | | | 0.2020*** | 0.5686*** |
| | | | -0.021 | -0.1371 |
| Control variable | Yes | Yes | Yes | Yes |
| Provincial fixed effect | Yes | Yes | Yes | Yes |
| N | 0.8019 | 0.8019 | 0.7816 | 0.7816 |
| R2 | 0.4966 | 0.4794 | 0.4997 | 0.4843 |
| F in stage one | | 29.62 | | 26.94 |
| Tool variable T value | | 13.84 | | 13.34 |
| DWH test Chi2 | | 8.796 | | 7.5812 |
| P | | -0.003 | | -0.0059 |

## 5.3. Adding control variables

The degree of financial development and per capital GDP at the regional level are included as additional control factors in this article based on the original control variables. The ratio of the balance of deposits and loans held by local financial institutions at the end of the year to GDP is one way to measure their degree of financial development. Improvements in regional financial development and per capita GDP have a major influence in encouraging consumption among urban and rural people, as shown by the regression findings in Table 6. Even after restricting it, the usage of digital money

continues to greatly encourage both urban and rural inhabitants' consumption. It is clear that this paper's estimation findings are reliable.

**Table 6.** Robustness test 3: Adding control variables.

| Variate | Total consumption expenditure of urban and rural residents | | | |
|---|---|---|---|---|
| | -1 | -2 | -3 | -4 |
| Use of digital finance | 0.2592*** | 0.9186*** | | |
| | -0.0209 | -0.1062 | | |
| Degree of use of digital finance | | | 0.2377*** | 0.8359*** |
| | | | -0.0175 | -0.0932 |
| Financial development level | 0.0388** | 0.0384** | 0.0337** | 0.0321** |
| | -0.0152 | -0.0155 | -0.0154 | -0.0157 |
| Lnper capital GDP | 0.1539*** | 0.1074*** | 0.1554*** | 0.1031*** |
| | -0.0213 | -0.0238 | -0.0216 | -0.0244 |
| Control variable | Yes | Yes | Yes | Yes |
| N | 0.8019 | 0.8019 | 0.7816 | 0.7816 |
| R2 | 0.4894 | 0.4329 | 0.4893 | 0.4241 |

## 6. Conclusion

This essay investigates the effects of digital finance on consumption among urban and rural inhabitants using sample data from the 2017 China Household Finance Survey. Clearly, digital money increases both urban and rural inhabitants' total spending levels. That is, under the influence of digital finance, consumption in 2016 was equal to 9000 yuan, with an average rise in consumption of 24.50% for urban and rural inhabitants who use digital finance compared to those who do not. The average household spending will rise by 22.37% if another form of digital financing is introduced, reaching 8000 yuan in 2016. After replacing the proxy variable of total consumption expenditure of urban and rural residents with average consumption tendency and adding regional control variables, the conclusions are still robust. Using the instrumental variable method and propensity score matching method for estimation, the conclusion that the use of digital finance has a significant promotion effect on the consumption of urban and rural residents is still very robust after overcoming the endogenous problem. The consumption growth of urban and rural residents is realized by the use of digital finance by improving the household non-agricultural employment level and financial availability, which confirms the non-agricultural employment effect and consumer credit effect mechanism of digital finance's impact on the consumption of urban and rural residents.

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