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Impact of Digital Finance on Household Service Consumption in China: A Panel Analysis of Domestic Demand Drivers

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Abstract

In the current new situation, China's economic growth model has shifted, with domestic demand becoming the primary driver of economic growth, particularly for service consumption. This study examines the impact of digital finance development on household service consumption. Using data from the China Household Finance Survey (CHFS), the study constructs a digital finance index at the household level. It applies a two-way fixed effects panel model to test its impact on service consumption. The research method uses a two-way fixed effects panel model to identify the relationship between digital finance development and the increase in household service consumption. Empirical findings indicate that digital finance significantly promotes service consumption among residents. After verifying the robustness of the baseline model, several heterogeneity analyses are conducted to explore variations in the effect of digital finance based on differing demographic and economic characteristics. These findings offer important implications for economic policy development, particularly in optimizing the role of digital finance in driving domestic consumption. The study's primary recommendation is that the government and digital financial service providers expand access to and literacy in digital finance, especially among groups with limited access. This approach is expected to strengthen the role of digital finance as a primary driver of service consumption, support sustainable economic growth, and reduce inequality in access to digital financial services within society.

Keywords: *Consumption structure; Digital finance; Service Consumption*

A. Introduction

Service consumption, or labor consumption, refers to the sum of all non-physical service costs that society provides within residents' total consumption expenditure. In 2019, the preliminary calculation value of China's per capita GDP exceeded US$10,000. Drawing from the consumption structure upgrading experiences in the United States, Japan, South Korea, and other countries, it is evident that China has entered a phase of service consumption development, transitioning from "food and clothing" to "housing, transportation, and recreation" (Chen, 2009). Service consumption across various fields has begun to flourish, with rapid growth in sectors such as housekeeping, elderly care, medical care, transportation, communications, culture, and entertainment. Digital finance has improved the allocation of financial resources, enhancing the availability of financial services for residents and significantly impacting their service consumption patterns. By reaching a broader range of low- and middle-income residents through lower financial service costs, digital finance exerts an inclusive effect (Yi & Guo, 2023). Enhanced access to financial services also eases liquidity constraints and increases residents'

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expectations for future income, reducing precautionary savings and stimulating consumption (Zeldes, 1989).

The literature reviewed in this article can be categorized into two primary areas. The first examines factors influencing service consumption, rooted in foundational consumption theories such as Keynes' (1936) absolute income hypothesis, Duesenberry's (1949) relative income hypothesis, Modigliani's life cycle hypothesis (1954), and Friedman's (1957) permanent income hypothesis. Additionally, theories on liquidity constraints (Zeldes, 1989) and precautionary savings (Leland, 1968) offer insights into consumer behavior under financial uncertainty. Kornrich and Roberts (2018) suggest that increased family income can drive service expenditure, replacing in-home labor with external services. Moreover, household members entering the labor market contribute to increased service consumption, such as dining out (Bellante & Foster, 1984). Over the past two decades, rising service prices, rather than income levels, have driven mainly Chinese residents' service consumption expenditure (Chen, 2009).

The advent of the digital economy has further expanded service consumption channels by mitigating income uncertainty, easing liquidity constraints, and strengthening social networks (Yi & Guo, 2023). Mobile payments, in particular, foster inclusivity, supporting consumption among vulnerable groups, including the elderly, low-income individuals, and those with low educational attainment (Zhao et al., 2022). By alleviating credit constraints, digital payments reduce consumption inequality and foster social capital accumulation (Chen & Cheng, 2021). Occasional and frequent use of digital payments in rural areas has proven effective in boosting household consumption, particularly among farmers (Chen et al., 2021). Additionally, consumer credit has positively impacted consumption habits, encouraging consumers to adjust their spending structure and increase durable goods purchases (Li & Wang, 2017). Nan and Sun (2020) noted that consumer credit is conducive to both recurring and non-recurring consumption, with a more significant impact on the latter. Thus, digital finance affects residents' consumption behavior through three primary mechanisms: facilitating consumption, reducing liquidity constraints, and expanding household income. By enhancing financial accessibility and income opportunities, digital finance supports a robust domestic demand and encourages a shift towards a consumption-driven economy, particularly within the service sector (Xie & Li, 2021). This study hypothesizes that digital finance development will significantly boost residents' service consumption, offering insights into its role in promoting sustainable growth and more inclusive consumer behavior.

B. Methods

1. Data Source and Processing

The empirical data used in this paper comes from the China Household Finance Survey (CHFS) of Southwestern University of Finance and Economics in 2017 and 2019. In terms of data processing, this paper excludes samples with missing key variables and negative values of total household assets, household income, and annual consumption. It performs bilateral truncation on multiple variables of total household assets, household income, and total annual household consumption at the 1% quantile. The provincial statistical data used in this paper comes from each province's statistical yearbooks, and each province's digital financial development index comes from the Digital Financial Development Center of Peking University. Finally, balanced panel data for 2017 and 2019 were obtained, with a total number of household samples of 31,684 and 15,842 households.

2. Variable Selection

Explained Variables

The hypothesis proposed in this paper is that developing digital finance can promote residents' service consumption. The household service consumption of residents is the variable explained in this paper. According to the National Bureau of Statistics definition, service consumption is residents' consumption expenditure on various life services. This paper draws on Yi Xingjian's method to construct residents' household service consumption expenditure from the China Household Finance Survey (CHFS) [14]. It includes eight categories: household services, medical services, transportation services, communication services, educational services, cultural and entertainment services, residential services and other services. This paper takes household service consumption as the explained variable.

Core Explanatory Variables

This study refers to the methods of Yin Zhichao et al. (2019) and He Jing and Li Qinghai (2019). This study examines households' use of digital finance from three perspectives: mobile payment, digital financial management, and digital lending, constructing a household digital finance index. According to data from the China Household Finance Survey (CHFS), if a household uses third-party mobile payment platforms, such as WeChat and Alipay, for shopping, it is considered that the household uses mobile payment (Yin et al., 2019). If the household participates in Internet financial management and purchases Internet financial management products, it is regarded as using digital financial management (He & Li, 2019). Additionally, if the household has a loan from an online lending platform or a consumer finance company, it is considered to participate in digital lending. This paper measures household participation in digital finance by the number of instances of mobile payments, digital financial management, and digital lending that the household engages in. The core explanatory variable takes a value of 0-3. In the robustness test section, this paper utilizes the Digital Finance Development Index, published by the Digital Finance Development Center of Peking University, as an alternative for the core explanatory variable to test robustness.

Control Variables

The control variables selected in this paper are divided into three levels: household head level, family level, and regional level. At the household head level, this paper selected household head age, gender, highest education, marital status, and health status. At the family level, this paper selected the following: annual household income, total household assets, number of family members, elderly dependency ratio, child dependency ratio, and urban and rural classification of the location. This paper selected per capita GDP and urbanization rate as control variables at the regional level. The descriptive statistics of each variable are shown in Table 1.

3. Model Design

To verify the hypothesis that the development of digital finance promotes residents' service consumption, this paper draws on the method proposed by Yi and Guo (2023) to analyze residents' service consumption. It constructs the following panel two-way fixed effect model.

$$y_{ijt} = \beta_0 + \beta_1 DI_{ijt} + X'_{ijt}\beta_2 + D'_{jt}\beta_2 + \phi_i + \varphi_t + \mu_{itj}$$

Among them, y_{ijt} represents the service consumption expenditure of households i in the province j in the year t, DI_{ijt} represents the core explanatory variable of this paper: the use of digital finance by households i in the province j in the year t, X'_{ijt} represents the control variables at the household head level and the household level,D'_{jt} represents the regional control variables in the province j in the year t, ϕ_i represents the household fixed effect,φ_t represents the year fixed effect and μ_{itj}represents the random disturbance term. In order to avoid the possible correlation of

household consumption behavior in the same district and county, the standard errors are clustered at the district and county level in the regression.

Tabel 1. Descriptive Statistics

Variable	Sample size	Mean	Max	Mix	Std
Digital Finance Index	31656	0.4715	3	0	0.6420541
Service consumption (yuan)	31656	25293.79	245106	384	32720.29
Educational background	31656	3.4013	9	1	1.655914
Gender (man=1)	31656	0.7749	1	0	0.4176625
Marital status (Married=1)	31656	0.8518	1	0	0.3552502
Age	31656	55.6908	93	17	13.95863
Health status (healthy=1)	31656	0.8045	1	0	0.3965816
Family population	31656	3.1414	17	1	1.550922
Proportion of children	31656	0.1040	0.8333	0	0.1609258
Proportion of elderly people	31656	0.2339	1	0	0.3660788
Family area（rural=1）	31656	0.3326	1	0	0.4711309
Annual household income (yuan)	31656	78899.49	635729	0	85880.5
Total household assets (yuan)	31656	967847.9	9797759	1986	1498045
Province GDP per capita (yuan)	31656	69291.13	164222	28496.5	30349.78
Urbanization rate of provinces	31656	0.6371	0.8923	0.4628	0.1042531

The table provides descriptive statistics on various factors influencing digital finance and service consumption among a sample of 31,656 observations. The Digital Finance Index shows a mean of 0.4715, indicating moderate adoption of digital finance with some variability, as reflected by a maximum value of 3 and a standard deviation of 0.6421. Service consumption has an average expenditure of 25,293.79 yuan, but with substantial variability (standard deviation of 32,720.29), showing a wide disparity in spending across households. The educational background of respondents averages 3.4013 (with a range from 1 to 9), suggesting moderate educational diversity. Gender is skewed towards males (mean = 0.7749), and most respondents are married (mean = 0.8518), while the average age is 55.69 years, with a wide range, reflecting the age diversity in the sample. Health status is generally positive, with most respondents considering themselves healthy (mean = 0.8045). Family size averages at 3.14 members, with considerable variation, which may influence consumption needs. The proportion of children in households is relatively low (mean = 0.1040), as is the proportion of elderly people (mean = 0.2339). About one-third of the households are in rural areas (mean = 0.3326), indicating a mix of rural and urban households in the data. Annual household income averages 78,899.49 yuan, with significant disparities, as shown by a high standard deviation of 85,880.5 yuan, suggesting income inequality within the sample. Total household assets are similarly varied, with a mean of 967,847.9 yuan and a wide range, indicating diverse economic backgrounds.

The province GDP per capita averages at 69,291.13 yuan, reflecting economic differences across regions, with urbanized areas showing higher values. The urbanization rate of provinces is 0.6371 on average, with higher urbanization linked to better digital finance access and higher service consumption. These statistics reveal a complex socioeconomic landscape, where income, asset levels, education, and urbanization influence access to digital finance and consumption behaviors, highlighting the socioeconomic diversity that may impact digital finance utilization and service consumption levels across households.

C. Findings and Discussion

1. Benchmark Model Estimation Results

The benchmark model estimation results are shown in Table 2. Column (1) shows the results of the regression of household service consumption using the core explanatory variables alone without adding control variables. Columns (2) to (4) show the regression results of the control variables at the household head, household, and regional levels. The year-fixed effect and household fixed effect are controlled in the regression process, and the standard error is clustered at the district and county levels. The regression results show that the household digital finance index significantly impacts residents' service consumption. After adding all control variables, the regression coefficient of the digital finance index on service consumption is 0.1462, and all regression results show that the household digital finance index is significant at the 1% statistical level.

Table 2. Benchmark Model Regression Results

Variable	(1)Service consumption	(2)Service consumption	(3)Service consumption	(4)Service consumption
Digital Finance Index	0.2622***	0.2496***	0.1464***	0.1462***
	(0.0256)	(0.0256)	(0.0177)	(0.0237)
Household head control variable	NO	YES	YES	YES
Household control variables	NO	NO	YES	YES
Regional control variables	NO	NO	NO	YES
Household fixed effects	YES	YES	YES	YES
Year fixed effects	YES	YES	YES	YES
Sample size	31656	31656	31656	31656

The table presents the regression results of the benchmark model analyzing the impact of the Digital Finance Index on household service consumption, with four models progressively adding control variables to test the robustness of the findings. In Model (1), which includes only the Digital Finance Index with household and year fixed effects, the index has a coefficient of 0.2622, significant at the 1% level, indicating a positive and significant influence of digital finance on household service consumption. In Model (2), which incorporates control variables related to household head characteristics, the coefficient of the Digital Finance Index slightly decreases to 0.2496. However, it remains significant, suggesting that the positive impact of digital finance persists even with these additional controls. Model (3) includes household-level control variables, further reducing the coefficient to 0.1464 while maintaining significance, indicating that household characteristics play a role in service consumption but do not negate the effect of digital finance. Finally, Model (4) includes household and regional control variables, showing a stable Digital Finance Index coefficient of 0.1462 with continued significance. These results consistently demonstrate the positive effect of digital finance on service consumption, supporting the hypothesis that digital finance promotes household service consumption. The stability of the coefficients across models suggests that this effect is not significantly confounded by household or regional characteristics, reinforcing digital finance as a robust driver of increased domestic demand in the service sector and a potential catalyst for economic growth through enhanced household consumption.

2. Robustness test

Considering the impact of endogeneity and contingency on the estimation results of the benchmark model, to strengthen the reliability of the conclusions of this paper, as shown in Table 3, this paper conducts robustness tests from three aspects.

Table 3. Robustness test results

	Replace the explained variable	Replace explanatory variables	Changing the clustering hierarchy
Variable	Service consumption	Service consumption	Service consumption
Digital Finance Index	0.01557***	1.4208**	0.1462***
	（0.0049）	（0.6541）	（0 .0167）
Household head control variable	YES	YES	YES
Household control variables	YES	YES	YES
Regional control variables	YES	YES	YES
Household fixed effects	YES	YES	YES
Year fixed effects	YES	YES	YES
Sample size	31656	31656	31656

The table presents the results of robustness tests conducted to verify the reliability of the findings on the impact of digital finance on household service consumption. Three approaches were used: replacing the explained variable, replacing explanatory variables, and changing the clustering hierarchy. In the first test, where the explained variable was modified, the Digital Finance Index showed a coefficient of 0.01557, significant at the 1% level, indicating that digital finance continues to positively and significantly impact service consumption even when the dependent variable changes. The second test involved replacing the main explanatory variables, yielding a coefficient of 1.4208 for the Digital Finance Index, which was significant at the 5% level. This suggests that the positive influence of digital finance on service consumption holds even with alternative explanatory variables, supporting the robustness of the initial findings. Lastly, changing the clustering hierarchy produced a coefficient of 0.1462 for the Digital Finance Index, significant at the 1% level, confirming that the positive relationship between digital finance and service consumption remains consistent despite adjustments in the clustering method. Together, these robustness tests demonstrate that the positive effect of digital finance on household service consumption is stable across different model specifications, reinforcing the conclusion that digital finance significantly promotes service consumption and serves as a key driver of domestic demand in China’s service sector.

The first is to replace the explained variable and the total amount of household service consumption with the proportion of household service consumption in total household consumption. The estimation results show that the coefficient of the household digital finance index is significantly positive, and the use of digital finance also has a promoting effect on service consumption in terms of consumption structure. The second is to replace the core explanatory variable and use the digital finance development index published by the Digital Finance Development Center of Peking University to replace the core explanatory variable. The regression result is significantly positive, which is consistent with the benchmark regression result. Third, considering the possible correlation between household consumption behaviors in the same province, the standard error clustering level

changes to the province level during the regression. The regression result is significantly positive, consistent with the benchmark regression result, and the benchmark regression result is robust.

3. Heterogeneity Analysis

Urban-rural Heterogeneity Test

Since there are significant differences in the level of financial development between urban and rural areas in China, the consumption habits between urban and rural residents are significantly different. This paper divides all households into two sub-samples, rural and urban households, and analyzes the difference in the impact of digital finance on urban and rural households. The regression results are shown in Table 4. The regression coefficient of digital finance in rural households is significantly greater than that in urban households (the two are 0.2153 and 0.1079, respectively), and both are significant at the 1% significance level. The main possible reason is that the penetration rate of the traditional financial industry in rural areas is not high. Rural areas have more severe financial exclusion than urban areas (Su et al., 2016) [21]. The universality of digital finance has a more significant effect on alleviating the financial exclusion of rural residents than that of urban residents.

Table 4. Results of The Urban-Rural Heterogeneity Test

	（1）Town	**（2）Rural**
Variable	Service consumption	Service consumption
Digital Finance Index	0.1079***	0.2153***
	（0.0266）	（0.0462）
Household head control variable	YES	YES
Household control variables	YES	YES
Regional control variables	YES	YES
Household fixed effects	YES	YES
Year fixed effects	YES	YES
Sample size	18514	12804

The table displays the results of the urban-rural heterogeneity test, examining the differential impact of digital finance on service consumption across urban (town) and rural areas. In the urban sample (Column 1), the Digital Finance Index shows a coefficient of 0.1079, significant at the 1% level, with a standard error of 0.0266. This indicates that digital finance has a positive and significant effect on service consumption in urban areas, although the magnitude of this effect is moderate. The positive relationship suggests that urban households spend more on services as digital finance expands, potentially due to better access to digital financial services and infrastructure in towns. In the rural sample (Column 2), the coefficient of the Digital Finance Index is 0.2153, which is also significant at the 1% level, with a standard error of 0.0462. This coefficient is nearly double that of the urban sample, indicating a more substantial effect of digital finance on service consumption in rural areas. The more significant impact in rural areas may suggest that digital finance is more critical in enhancing consumption among rural households, likely because rural areas have historically faced more significant financial access constraints. Digital finance may help overcome these barriers, increasing rural households' service consumption more significantly as they gain access to digital payment systems, credit options, and other financial services.

The heterogeneity test results reveal that while digital finance positively influences service consumption in urban and rural settings, the effect is more pronounced in rural areas. This finding underscores the potential of digital finance to reduce the urban-rural gap in financial accessibility and consumption, promoting more balanced economic development across different regions. The study suggests that policies aimed at expanding digital finance in rural areas could substantially stimulate service consumption, contribute to economic growth, and reduce regional disparities.

Income Heterogeneity Test

China has a considerable number of low- and middle-income groups. Exploring the consumption potential of the vast number of low- and middle-income people and increasing the service consumption of the low- and middle-income people are essential driving forces for consumption growth. This paper divides all households into two sub-samples of higher- and lower-income households based on the median household income in all samples. It analyzes the differentiated effects of digital finance on households with different income levels. The regression results are shown in Table 5. The regression coefficient of digital finance in lower-income households is more significant than that in higher-income households (the two are 0.1432 and 0.1168, respectively), and both are significant at the 1% significance level. Possible reasons include that digital inclusive finance has lowered the threshold for obtaining financial services and alleviated the credit constraints faced by low- and middle-income groups who originally had difficulty obtaining loans. In addition, the convenience of payment brought by digital finance is also more conducive to stimulating the demand for service consumption by low- and middle-income groups.

Table 5. Results of the income heterogeneity test

	（1）High income	**（2）Lower income**
Variable	Service consumption	Service consumption
Digital Finance Index	0.1169***	0.1432***
	（0.0328）	（0.0437）
Household head control variable	YES	YES
Household control variables	YES	YES
Regional control variables	YES	YES
Household fixed effects	YES	YES
Year fixed effects	YES	YES
Sample size	10676	12798

The table presents the results of the income heterogeneity test, analyzing the impact of digital finance on service consumption across high-income and lower-income households. In the high-income group (Column 1), the coefficient for the Digital Finance Index is 0.1169, significant at the 1% level, with a standard error of 0.0328. This finding indicates that digital finance has a positive and significant effect on service consumption among high-income households, though the magnitude of this effect is relatively modest. The positive relationship suggests that as digital finance expands, high-income households increase their spending on services, likely due to better financial literacy, access, and flexibility to utilize digital financial tools. In the lower-income group (Column 2), the Digital Finance Index has a coefficient of 0.1432, which is also significant at the 1% level, with a standard error of 0.0437. This coefficient is slightly higher than the high-income group, indicating that digital finance significantly impacts service consumption among lower-income households. The more significant effect among lower-income households may imply that digital finance plays a more crucial role in enhancing consumption within this group, as digital financial services

provide lower-income households with improved access to credit, payment options, and savings mechanisms that they might not have had otherwise.

These findings from the income heterogeneity test indicate that digital finance positively influences service consumption in both income groups, but its impact is slightly more pronounced among lower-income households. This suggests that digital finance has the potential to reduce consumption disparities between income groups by enabling lower-income households to engage more in the service economy. Policies supporting the adoption and accessibility of digital finance among lower-income groups could enhance this effect, promoting greater economic inclusivity and helping bridge the gap in service consumption across different income levels.

Regional heterogeneity test

There are apparent differences between the East and West in developing digital finance in China. In order to examine the differences in the impact of digital finance on service consumption in the East and the central and Western regions， according to the division of the National Bureau of Statistics, this paper divides the sample into two sub-samples, the central and western samples, and the eastern samples, according to the location of the family, to analyze the differentiated effects of digital finance on families with different income levels. The regression results are shown in Table 6. The regression coefficient of digital finance in the central and western families is smaller than that in the eastern families (the two are 0.1270 and 0.1633, respectively), and both are significant at the 1% significance level. Possible reasons are: First, the development of digital finance in eastern China is faster than in central and western regions, and residents have greater convenience in consumption through digital finance. Second, from the perspective of commodity economy development, the eastern region is more developed than the central and western regions, which brings richer and higher-quality high-end service consumption, making eastern residents have more service consumption needs.

Table 6. Regional heterogeneity test results

	（1）East	**（2）Midwest**
Variable	Service consumption	Service consumption
Digital Finance Index	0.1633***	0.1270***
	（0.0334）	（0.0335）
Household head control variable	YES	YES
Household control variables	YES	YES
Regional control variables	YES	YES
Household fixed effects	YES	YES
Year fixed effects	YES	YES
Sample size	13946	17710

The table presents the results of the regional heterogeneity test, analyzing the impact of digital finance on household service consumption across different regions in China, specifically the East and Midwest. In the eastern region (Column 1), the Digital Finance Index has a coefficient of 0.1633, which is significant at the 1% level, with a standard error of 0.0334. This result indicates that digital finance positively and significantly affects service consumption in the East, where economic development and financial infrastructure are generally more advanced. The relatively higher coefficient suggests that households in the East respond positively to digital finance, potentially due to better access to financial services, higher levels of digital literacy, and a more developed market for digital financial

products. In the Midwest region (Column 2), the coefficient of the Digital Finance Index is 0.1270, which is also significant at the 1% level, with a standard error of 0.0335. Although digital finance still positively and significantly impacts service consumption in the Midwest, the effect is slightly lower than in the East. This difference may reflect regional disparities in infrastructure, financial access, and economic conditions, with the Midwest typically having less developed financial services than the East. The smaller coefficient suggests that while digital finance promotes service consumption in the Midwest, the impact is somewhat constrained by regional factors such as lower income levels, limited access to digital financial services, or lower digital adoption rates. Digital finance positively influences service consumption in the East and Midwest regions, though the effect is more substantial in the East. This regional variation highlights the importance of tailored policies to promote digital finance in less developed areas like the Midwest, where additional support for digital infrastructure and financial literacy could help enhance the impact of digital finance on household consumption. Expanding digital finance accessibility in the Midwest may contribute to more balanced economic development across regions, promoting a more inclusive growth model that leverages digital finance as a driver of service consumption.

D. Conclusion

This study concludes that digital inclusive finance significantly enhances household service consumption in China, crucial in driving economic growth and improving residents' consumption structure. The analysis of China Household Finance Survey (CHFS) data from 2017 and 2019 reveals that digital finance has a more substantial effect on service consumption in rural areas than urban areas and is more impactful in eastern regions than in central and western regions. Additionally, the positive influence of digital finance on service consumption is vital for low-income households, indicating its potential to reduce consumption disparities across income levels and regions.

To maximize the benefits of digital finance, it is recommended that policymakers focus on expanding digital financial infrastructure and services in rural and less developed areas, where the impact is more pronounced. Enhancing financial literacy and digital inclusion programs for low-income households and underdeveloped regions can also empower these groups to use digital financial tools better. Additionally, supporting tailored financial products that address the needs of low-income households and fostering innovation in digital financial services can further stimulate service consumption, promoting inclusive and balanced economic growth across China.

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