Consumer Borrowing in Rural and Urban China

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Abstract

This study examines differences in consumer borrowing between rural and urban households in China and associations between consumer borrowing and financial assets and knowledge. Using data from the 2014 China Family Panel Study, results show that there is no difference in formal and informal borrowing among rural and urban households in China. Compared to households that are willing to borrow from families/friends, only rural households that are not willing to borrow are associated with lower financial assets. Only urban households that are willing to borrow from banks or other formal channels tend to have higher financial knowledge.

Keywords: China, consumer behavior, urban-rural comparisons, borrowing
JEL: C20, D10, D19

Introduction

China has a typical urban-rural dual economy structure, where urban areas are significantly more developed leading to geographic disparities of income and consumption creating geographic inequality (Sicular et al., 2007). As a growing economy, China has also shown an increase in urbanization in a very short period of time. By the end of 1978, 17.9% of Chinese households resided on an urban area. By the end of 2013, more than half of all Chinese households were urban (Want et al., 2015). An important factor in urbanization is the implementation of financial markets and formal banking. Access to efficient financial institutions is believed to help firms and households to better their financial lives via access to credit, more investment options and insurance (Fry 1995) and improve financial inclusion (Demirgüç-Kunt & Klapper, 2013; Beck et al., 2007).

Rural households in China are less likely to have a bank account (Sui & Niu, 2017) or credit cards (Porto, Huang & Xiao, 2017). The aforementioned Sui and Niu (2017) used decomposition analysis to reveal that both supply-side and demand-side barriers exist preventing rural households from utilizing formal banking. Lack of financial intermediaries such as banks and lending institutions limit access to credit and other financial products in rural areas. In addition, lack of trust on financial institutions and reliance on informal credit from family and relatives also decrease household participation in financial markets, these issues being more prevalent amongst households in rural areas. These imperfections in the rural credit market may be considered to be a market failure that justifies government intervention and policies from central banks (Besley 1994).

The current study attempts to contribute to the literature of consumer finance in China by examining if there any differences in borrowing choices between urban and rural households. Since 2012, more than half of China population lives in a rural area (Bloomberg 2012). Understanding the financial needs of the other rural half should be of concern to policymakers in promoting their financial wellbeing and the overall health of the Chinese economy. For instance, previous studies have found that access to formal credit improve farm profits in rural areas (Foltz 2004). In addition, we examine if borrowing choices are associated with two financial outcome variables: financial asset and financial knowledge.

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Methods

Data

Data used in this study were from the 2014 China Family Panel Studies (CHFS), a nationally representative sample of Chinese households conducted by the Institute of Social Science Survey from the Peking University. For this study, we will be using the Family Questionnaire portion of the data set with a sample size of almost 14,000 respondents. While the questionnaire asks for family information, the definition used in the survey most resemble the definition of a household, a group of people living in one housing unity sharing financial resources. We will use the term household throughout this study. Observations missing one of the key variables of interest are dropped from the regression models for a final sample of 12,353 completed cases.

Variables

Household asset is our main dependent variable of interest. The interested independent variable is rural status, where 1 if a respondent living in a rural area, otherwise 0. Control variables include several measurements of assets and household income. All figures are in yuan.

The variable First Person to Borrow is constructed from the survey question *If your family need to borrow a large amount of money (e.g. purchasing house, operation turnover), the first choices of borrowing money is from…* Choices are mutually exclusive and include Family, Friends, Bank, Formal financial institution other than bank, Individual or private loan institution or Will not borrow money under any condition. For this study, we collapsed these choices into three groups: 1. Family/Friends, 2. Banks and other Formal Borrowing (include bank, formal institution and loan institutions), and 3. Will not Borrow.

Finally, the Financial Knowledge variable was constructed from 13 surveys questions on general financial topics such as interest rate calculations, investment risk, and bank products. Those questions were only asked to households where the family member most knowledgeable on personal finances was available.

Data Analyses

We used the following model (Equation1) to estimate results using our data:

$$Y = \alpha + \beta_1 \boldsymbol{X} + \beta_2 \delta + \beta_3 \gamma_i + \beta_4 \theta_i + \epsilon \qquad (1)$$

where δ is a vector of household financial variables including income, house values and size of financial products. θ captures three indicators of borrowing choice: from family/friends, from a formal institution or unwilling to borrow from anyone. Our main variable of interest, X, is a binary where 1 represents a rural household. The error term ϵ is independent and identically distributed with a mean of zero and variance of σ^2. The same model applies to both set of regression using initially household assets as Y and then financial knowledge as the dependent variable.

Results

Summary Statistics

Table 1 displays summary statistics by households' place of residence. We see significant differences between rural and urban households to almost all of our main variables of interest, further indication of the geographic and financial divide in China. Urban households are wealthier in both assets and income measurements. Moreover, urban households also display a considerably higher level of financial knowledge than their rural counterparts.

Urban-Rural Differences in Consumer Borrowing

Regarding borrowing choices, the evidence is mixed. There are no significant differences between rural and urban households when choosing to borrow from a bank or other formal financial institution. However, rural households are more likely to choose Family and Friends as their main borrowing channel while less likely to state that they will never borrow from anybody (Results are not shown but will be presented at the conference). A potential explanation is that rural households are more credit and resources constrained, relying on their social networks for most of their borrowing.

Consumer Borrowing and Financial Assets

Tables 2 and 3 employs ordinary least squares with clustering by province to control for error correlation within each cluster. Both tables include a first column for the full samples and subsequent columns by Rural and Urban to better highlight intrinsic differences between both types of household.

Household asset is the dependent variable on Table 2. Despite differences in household assets by place of residence, the dummy for Urban is not statistically significant on the first model. Banks as the first borrowing choice is positively associated with more household assets in all columns while Will Not Borrow is correlated to lower assets to rural households. Due to the inclusion of several components of assets, this model has high adjusted R-squares across the board but we find no

evidence of multicollinearity (VIF of 1.10, full model). In addition, the model includes too few independent variables to raise concerns of overfitting.

Consumer Borrowing and Financial Knowledge

In Table 3, our sample is reduced to 3,631 observations since only a fraction of respondents were selected to answer the financial knowledge section of the survey. In fact, we only have financial knowledge survey questions for 232 rural households.

Column 1 indicates that being in an urban household is associated to higher levels of financial knowledge. Formal is also positively associated with higher financial knowledge while unwillingness is correlated to lower levels of financial knowledge. Moving to individual analysis of rural and urban subsamples in columns 2 and 3, a few unique differences are revealed. Rural household holding more financial products scored better on the final knowledge questions, perhaps indicating more familiarity with financial products. Family size s is related to lower levels of financial knowledge for urban households, potentially due to diminished human capital available.

Limitations and Conclusion

This study attempts to examine urban-rural differences in the usage of formal lending using a large national survey of households in China. We find that rural households (lack of) choice to participate in formal lending has relevant implications on their financial lives. Rural households' decision – or lack of option – to reject formal lending in favor of borrowing from their social networks reduce their overall wealth. Moreover, rural household that refrain from any type of borrowing also display less assets than other rural households that choose or are able to obtain formal borrowing.

These results might be an indication that factors inherent to living in a rural area such as less access to banks and other formal lending institutions might hamper households' financial success.

While borrowing from friends and family could be the least costly option, lack of access to formal lending might preventing many rural households from leverage their future wealth and/or to properly overcome financial emergencies. The fact that rural households have less assets and earn less income than urban households can further widen the financial gap between both when financial institutions are not available.

Our variable of interest – borrowing choices – is built upon the households' response to their first lending choice but does not give us information if the household has actually borrowed from a bank, a friend or any of the other choices available. As such, we are unable to separate intention from action. However, the survey question on borrowing choice can be seen as indicator where households will be more likely to go when the need for credit arises or if borrowing does not fit their financial habits in any form. Ideally, we hope to include actual indicators of actual borrowing to this study to better examine how rural (and urban) households manage their credit options.

Policymakers and financial institutions involved in lending should be aware of the hurdles rural households might be facing to take out a loan. A more comprehensive network of banks in the rural area may not just facilitate access to formal lending but also remove part of the social stigma associated with lending in China.

Financial educators and other agents delivering financial knowledge can also play an important part to improve the wellbeing of rural households. Rural household lower level of financial knowledge could have a number of serious financial consequences from lack of retirement planning (Lusardi & Mitchell 2007) to investment performance (Clark, Lusardi, & Mitchell, 2014).

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Table 1: Key Variable Rural-Urban Differences

	Rural		Urban		
	mean	sd	mean	sd	p-value
Total household expenditure (yuan)	44989	100311	70154	142948	0.000
Net household income (yuan)	42161	71161	69454	163053	0.000
Property income (yuan)	352	2415	1849	9511	0.000
Transfer income (yuan)	4584	53988	20159	137135	0.000
Total amount of cash & deposits (yuan)	16952	44047	49391	130811	0.000
House value (net) (yuan)	162008	336392	506728	975260	0.000
Net household asset (yuan)	234194	395999	618186	1100600	0.000
Total value of financial product (yuan)	327	6502	11285	92590	0.000
Household size	3.97	1.96	3.38	1.66	0.000
By First Choice to Borrow					
Family/Friends	0.63	0.48	0.59	0.49	0.000
Banks and other formal borrowing	0.21	0.40	0.22	0.41	0.288
Will not Borrow	0.11	0.31	0.14	0.35	0.000
Financial Knowledge	4.38	3.06	5.88	3.11	0.000
N	7,042		6,789		13,831

Source: 2014 China Family Panel Studies.

Table 2: Ordinary Least Squares, Household Assets as dependent variable

	(1) Household Assets - All b/se	(2) Household Assets - Rural b/se	(3) Household Assets - Urban b/se
Total household expenditure (yuan)	0.1989*	0.1469	0.2146
	(0.072)	(0.111)	(0.117)
Total value of financial product (yuan)	1.6027***	2.3021***	1.6235***
	(0.058)	(0.265)	(0.058)
Net household income (yuan)	0.1734	0.4449	0.1151
	(0.085)	(0.292)	(0.064)
House value net (yuan)	1.0548***	1.0550***	1.0558***
	(0.004)	(0.020)	(0.004)
Household size	5282.2533**	3641.9190**	5720.3486*
	(1607.553)	(1253.850)	(2128.945)
Urban area (Census Bureau's definition)	1428.1632	N/A	N/A
	(9051.387)		
First Person to Borrow (ref: family/friends)			
Banks or other formal borrowing	22840.0724***	17374.1288**	28254.5031***
	(5835.889)	(6064.509)	(7177.221)
Will not Borrow	-3881.1875	-11701.6987*	4428.6763
	(3943.453)	(4299.065)	(6677.324)
Constant	22836.4597***	22238.7354**	22440.2655*
	(5414.374)	(6579.061)	(8464.301)
Observations	12353	6314	6039
R^2	0.948	0.856	0.958
Adjusted R^2	0.948	0.856	0.958

2014 China Family Panel Studies
* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table 3: Ordinary Least Squares, Financial Knowledge (0-13) as dependent variable

	(1) Financial Knowledge - All b/se	(2) Financial Knowledge - Rural b/se	(3) Financial Knowledge - Urban b/se
Total household income (yuan)	-0.0001	0.0158*	-0.0001
	(0.000)	(0.006)	(0.000)
Total household assets (yuan)	0.0013***	0.0009*	0.0013***
	(0.000)	(0.000)	(0.000)
Total household expense (yuan)	0.0029	0.0028	0.0029
	(0.002)	(0.003)	(0.002)
Total value of financial product (yuan)	0.0004	0.0128***	0.0004
	(0.001)	(0.003)	(0.001)
House value net (yuan)	-0.0011***	-0.0002	-0.0011***
	(0.000)	(0.001)	(0.000)
Family size	-0.1379***	-0.0026	-0.1739***
	(0.028)	(0.108)	(0.026)
Urban area (Census Bureau's definition)	1.3800***	0.0000	0.0000
	(0.312)	N/A	N/A
First Choice to Borrow (ref: family/friends)			
Banks or other formal borrowing	0.4137**	0.7744	0.3662**
	(0.125)	(0.524)	(0.110)
Will not Borrow	-1.4115***	-1.6326*	-1.4094***
	(0.219)	(0.694)	(0.210)
Constant	4.5529***	3.0151***	6.0748***
	(0.392)	(0.556)	(0.198)
Observations	3631	232	3399
R^2	0.113	0.267	0.098
Adjusted R^2	0.111	0.240	0.096

2014 China Family Panel Studies
* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

The Impact of Rural Women's Labor Participation on Large-Scale Agriculture Enterprise in China: A case study of Sichuan

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Key words: Large-scale agriculture, agricultural employees, rural women, multiple employment, and multiple job-holding household

Abstract

At present, China's food consumption structure is undergoing rapid transformation, with the proportions of consumed grain, vegetables, meat, poultry, eggs, and dairy gradually shifting from 8:1:1 to 4:3:3. Current agriculture is also transitioning from low value-added grain production to the production of vegetables, fruits as well as meat, poultry, eggs, and dairy in an increasingly higher proportion. It can be surmised from both the empirical data and the statistical data, compared with grain crops, vegetables and fruits are on the fastest growth trajectory and require more labor force. Concurrently, the amount of new-type agriculture enterprises entities in China is growing year by year, and they are primarily based on large-scale enterprises greater than traditional farmers.

This paper aims to discuss the diversified organizational forms of wage labor in large-scale agriculture enterprises and rural women's labor participation in agriculture in China today.

Since China's reform and opening up in the 1980s, the academic has paid attention to migrant workers from rural areas, and the large-scale migrant movements of provinces has been the main focus. However, those who remain in the rural areas as active labor in the agriculture sector have been less studied. Some are working on family farming, while some expand to the large-scale agriculture enterprises, and the left are as hired labor in rural. In statistics those who as the hired labor in large-scale agriculture has not be counted, and the statues of labor participation of them is not accurate; therefore, they are usually listed as surplus labor force.

Many previous research emphasized on the parts integrating large-scale agriculture enterprises and mechanization and believed that the large-scale enterprises inevitably narrows the utilization of the rural labor force and has negative impact on the income increasing of rural families. Simultaneously, someone iterated that within a trend of a large amount of non-agricultural employment, also known as surplus labor, exists in rural areas, especially among rural women and the elderly. However, empirical data and the cases show that they are participating in modern agricultural production in multiple organizational forms rather than surplus or idle labor, greatly contributing to agricultural production and their families.

The innovation of this paper: firstly, it values the part of the population neglected by the most official statistical data and presents their specific working status with the field research data. Secondly, it calculates their labor time distribution and annual income through two periods field data (in 2012 and 2018) and verifies their significant economic contribution through statistical analysis.

This paper adopts the quantitative and qualitative, mixed research method. Beginning with quantitative analysis and statistical description, the paper undertakes in-depth interviews and qualitative analysis.

Firstly, due to the extreme deficiency of direct official statistics of labor and employment status of population of this type, the paper collects partial data from existing database from different angles. (1) The characteristics of labor participation in agricultural production and proportion of family income sources in western regions are depicted from the panel data of rural fixed observations point of the Ministry of Agriculture (from 2003 to 2014 in Sichuan Province). (2) According to village questionnaires including the respective proportions of rural women participation in agricultural production and migrant non-agricultural labor in the CFPS and CHARLS data, these representative samples are used to depict population attributes, labor time and income of rural Chinese women participating in agricultural labor.

However, in the above-mentioned database, the very limited variable quantities related to labor participation fails to show the diversity of agricultural production and labor or to fully reveal the complexity of the relationships between agricultural participants and employers. The above-mentioned quantitative analysis is difficult to explain the reasons behind individual subjective choice behaviors of labor participants and the economic differences in the employment relationships of different

agricultural productions. Both of them can only be completed based on the qualitative data obtained from field research.

This study collects qualitative data primarily through semi-structured interview, with the contents included originating from direct questionnaires and semi-structured interviews to acquire the laborer family backgrounds, their reasons, and willingness to participate in waged agricultural labor as well as their individual working modes, including how to distribute and coordinate the time for the family labor and their own agricultural production (unpaid) and through which channel and social network they join in organizations offering waged labor.

Interview sources consist of two parts: (1) field research in September 2012, including the information and materials of an intermediary organization of agricultural labor, its principal, and 5 laborers; (2) field research conducted from March 2018 to May 2018, including interview materials from the agricultural labor employer and dozens of laborers. This research, after qualitative analysis generated by combining materials of the two instances of field research, summarizes three organizational forms including (1) family labor; (2) direct hired labor; (3) contract-type/outsourcing-type wage labor, and analyzes the characteristics and application scopes of the three forms in detail.

Accessibility of Financial Services and Household Consumption: New Evidence from Micro Data in China

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Abstract

This paper provides new evidence of the impact of access to financial services on household consumption. It identifies two important channels through which accessibility of financial services affects consumption: current income sensitivity and credit constraints. This paper employs a more micro focused measure as a proxy for financial development and access to financial services, which better captures how financial development potentially impacts household consumption, using data from the China Household Finance Survey. Our key finding is that access to financial services has a sizeable effect on household consumption, especially among households with lower income and being loan constrained. This paper also shows that access to financial services is an important factor in determining consumption patterns and consumption structure.

Introduction

It is well recognized that financial development is important for economic growth (Levine, 2005), the reduction of income inequality (Levine, 2007; Mookerjee and Kalipioni, 2010), and poverty alleviation (Beck et al., 2007). However, most empirical literature on the impact of financial development focuses on financial depth, using macro-perspective measures. Recently, researchers have turned their attention to questions of financial outreach: the extent to which households can access formal financial services, using randomized or quasi-experimental settings (Karkan and Zinman, 2010; Ruiz, 2013; Bruhn and Love, 2014).

In addition to its impact on economic growth and poverty reduction, financial outreach can also affect an individual household's consumption decisions; however, existing literature discusses little about this effect. In addition, several papers have explored the important nexus between financial development and consumption growth (Cecchetti et al., 2006; Ang, 2011; and Suzuki, 2014). All of these studies document an economically and statistically significant negative correlation between financial development and consumption volatility, as measured by the variance of consumption and aggregate measure of financial development. They do not investigate the causal relationship between financial development and consumption growth. While financial institutions in China, especially in the microfinance industry, have grown rapidly over the past few decades, there is still little evidence on the causal impact of access to financial services on consumption.

This paper seeks to fill this gap and add new evidence on the impact of access to financial services on household consumption. We note that the measure of access to financial services in the majority of extant literature is from a relatively macro perspective. The preferred measure of financial development has been *private credit*, such as the value of all credit that financial intermediaries issue to the private sector as a share of GDP (Levine, 2005). In this paper, we employ a more micro measure as a proxy for financial development and access to financial services, which better captures how financial development potentially impacts household consumption. We also note that existing studies focus on examining factors to explain the continuous insufficient consumption and China's continually rising savings rate. These factors include life cycle permanent income theory (Modigliani and Cao, 2004); precautionary savings in the face of limited health care; pension and education benefits (Meng, 2003; Chamon and Prasad, 2010; Bai and Wu, 2014); income distribution (Jin et al, 2010); and the growing gender imbalance (Wei and Zhang, 2011). However, the effect of access to financial services seems to be overlooked by the existing studies.

Existing studies have investigated the impact of financial development on consumption from the perspective of financial marketization (Jappelli and Pagano, 1989), financial liberation (Levchenko, 2005), and financial supply factors (Ludvigson, 2006). However, most of these studies reveal the economically significant effect of financial development on consumption based on macro data such as panel data (national level or provincial level) or time series data without controlling for the demographic characteristics and economic conditions. Another deficiency of these studies is their inability to explain

why better financial development can stimulate consumption.

This paper seeks to add new evidence on the impact of access to financial services on consumption. We use a unique set of micro data in China, the 2011 China Household Finance Survey (CHFS), and a micro measurement of financial development, the number of bank branches in each community, to evaluate the effect of improved access to financial services on household consumption. Two possible elements exert pressure on the exogeneity of access to financial services. First, the number of bank branches is calculated by counting the number of opened bank deposit accounts of all the interviewed households in each community, which might over-estimate households' access to financial services in each community. Second, places with higher consumption might attract financial institutions to set up branches there; that is to say, access to financial services might suffer from a reverse causality problem. Therefore, we instrument the amount of bank branches using the population density of each county in 2000 as instruments, which we believe to be exogenous.

We first show that access to financial services should not be taken for granted. The majority of households in China lack access to financial services, especially in the rural areas, and household consumption is much higher in regions with better access to finance. This suggests that financial development strategies are likely to be more efficient when differentiating among different regions. Both the baseline results and 2SLS results show that improved access to financial services has a sizeable effect on consumption, and its impact is larger in the rural areas. Thus, promoting the universal development of financial markets is an important measure to stimulate household consumption. Though we use instrument variables to eliminate the endogeneity problem, we cannot observe all the characteristics that might affect consumption decisions. As a result, we cannot completely rule out the possibility of omitted variable bias.

Further analysis indicates that improved access to financial services also significantly alters households' consumption structure as well as their consumption habits, showing less durable consumption and more non-cash consumption. Finally, we point out three important channels through which improved access to financial services affects consumption: the decrease of sensitivity to current income; the relaxing of liquidity constraints; and the wealth effect of financial market investments. Results show that the impact of access to financial services differs substantially depending on income, credit constraints, and financial market participation. This indicates that financial development should favor specific segments of the population.

The rest of the paper is organized as follows. In section 2, we summarize data used in the study and preliminary empirical patterns, and we also lay out our empirical strategy. In section 3, the empirical findings are reported and discussed. The last section concludes.

Data, Measurement Issues, and Preliminary Patterns

We use data from the 2011 China Household Finance Survey (CHFS). CHFS is a biennial household survey covering detailed information on households' demographic characteristics, assets and debts, insurance and social welfare, and income and expenditures. This survey is conducted by Southwestern University of Finance and Economics (SWUFE) and randomly selects 80 counties from among the total 2,585 counties in the country. (Tibet, Xinjiang, Inner Mongolia, Macau, and Hong Kong are not included.) Four communities are randomly selected from each county. In total, there are 320 communities, from which 8,438 households are randomly selected. The data set is representative in terms of both economic development and geographic location.

The purpose of this paper is to evaluate the effect of improved access to financial services on household consumption. The number of bank branches in or around a community is used to measure the access to financial services for households in each community. We calculate the number of bank branches in or around a community by counting opened bank deposit accounts (time deposits and demand deposits) of all the interviewed households in each community. We believe that the number of bank branches in or around the community a family resides in directly affects its financial behavior and can more accurately measure its access to financial services. We should note that "the number of bank branches in or around a community" in this paper is not strictly the number of bank branches located in or around a community; it is the total number of bank branches whose financial services can be easily enjoyed by households residing in the community. This is a more micro perspective measurement, better and more accurately capturing the effect of access to financial services.

Someone may argue that access to finance should be defined in the sense of per capita. Therefore, we also construct another three measurements of access to financial services at the county level: the number of bank branches per 10,000 people; the number of ATMs per 10,000 people; and the number of security exchanges per 10,000 people in 2010. Data on the number of bank branches, the number of automated teller machines (ATM), and the number of security exchanges in each county

are manually collected. The population data comes from the "Tabulation on the 2010 Population Census of the People's Republic of China by County." Mookerjee and Kalipioni (2010) measured access to financial services based on the number of bank branches per 100,000 people in a country level.

The primary outcome variable in this paper is the logarithm of total consumption in the year 2010. Households with more than 10 members are excluded because the decision-making subject of consumption becomes unclear when there are too many household members. Samples with household incomes of less than 1,000 RMB and households with total consumption of more than five times their total income are also eliminated. Our final sample includes 6,549 households, of which 4,026 reside in urban areas and 2,523 reside in the rural areas.

To investigate the impact of access to financial services on consumption structure, we construct another six outcome variables, indicating the proportion that each type of consumption comprises of the total consumption. According to the Household Consumption Expenditure Classification (2013) standard released by the National Bureau of Statistics (NBS), we divide total consumption into six parts including food consumption, clothing consumption, housing consumption, daily consumption, transportation and communication consumption, and consumption on education and training. The ratio of each type of consumption of the total consumption is calculated. To measure consumption patterns, we define another three outcome variables by creating dummy variables for each household in the sample, indicating whether a household a) owns an active credit card; b) consumes with non-cash payment; and c) suffers from credit constraints. All dummies are defined for the whole sample, meaning that they denote the percentage of all individuals in the sample who fall into each category.

Control variables:

Our empirical specification recognizes that there are many determinants of household consumption, and we consider a wide set of variables that are available in the face-to face survey data. As in the previous studies, we consider a variety of socioeconomic characteristics and demographic variables known to affect consumption behavior. The head of household's age is included to control for the life-cycle factors. The education level, marital status, health status, and risk towards attitude are included to control for the impact of individual background on household consumption. The household's size, young dependency ratio, and elder dependency ratio are included to control for family burden factors. Consumption is also greatly affected by wealth, so we add the total household income and household net wealth. Additionally, we add a dummy for home ownership and a dummy for self-employment. To control for regional factors, the per capita GDP of counties and provincial dummy variables are included.

Most importantly, we add measures of access to financial services. One of the main hypotheses of this paper is that people who lack access to financial services consume less because financial exclusion impedes income growth and restrains investment. We use the number of bank branches in or around a community to account for access to financial services. In Table A1, we report the summary statistics and detailed definition for the outcome variables and control variables.

We report the distribution of household total consumption across demographic variables such as age, education, marital status, gross income and wealth, and gross community bank number in Table 2. As expected, the total household consumption is a little higher in younger households and it is much lower among households with an unmarried head of household, which might be the result of saving money for marriage. Total household consumption increases sharply with the level of education and also increases strongly with total household income and net wealth. Total household income is the sum of labor income, financial income, and other transfer income. Net wealth is the sum of financial assets, business assets, land, house values, and car assets minus total debt. These correlations are consistent with existing studies.

Table 2: Total Household Consumption across Subgroups

Age		**Household Income Quartiles**	
<25	55151.56	1(low)	16474.68
25-35 years	55916.75	2	29169.29
35-45 years	45088.53	3	42314.99
45-55 years	38253.98	4(high)	74357.24
55-65 years	31214.76		
>65 years	29716.49	**Net Wealth Quartiles**	

		1(low)	22031.14
Education		2	28683.7
No school	22130.11	3	40642.73
Primary	31798.11	4(high)	70860.87
High school	44265.23		
Higher vocational	69897.40	**Community Bank Number**	
University	108077.10	0	18101.86
		1-3	29688.39
Marital Status		4-6	46991.25
Unmarried	37531.04	7-9	71930.31
Married	40906.38		

One explanation about insufficient consumption that has not yet been well-explored in the literature is that the under development of financial sectors restrains household consumption. In table 2, we report total household consumption across different levels of financial development measured by the number of community banks introduced above. Total household consumption increases sharply with an increased number of community banks. Households with 7 – 9 community bank branches nearby have approximately four times the total consumption of those with no banks in close proximity.

Main Results

Access to Financial Services and Household Consumption

We now turn to examine whether the relationship between the number of community banks and the level of consumption holds true after accounting for many other determinants of consumption, such as demographic variables and regional factors. We first investigate the impact of access to financial services on total household consumption by using the classical linear regression model. The model is specified as below:

$$\ln(Consump) = \alpha + \beta * Financial\_Accessibility + \gamma X + \varepsilon \quad (1)$$

Where *Consump* denotes household total consumption in 2010. *Financial_Accessibility* represents the access to financial services measured by the number of bank branches in or around the community a household resides in. *X* represents other control variables, including household characteristics, the head of household's demographic variables, and regional factors. ε is the residual term.

The regression results are presented in Table 3. Column 1 shows the OLS regression results. We find that the number of community banks has a positive and statistically significant impact on total household consumption. Those who live in communities with more bank branches will also consume more.

Table 3: Accessibility of Financial Services and Household Consumption

	(1)	(2)	(3)	(4)	(5)	(6)
	Full Sample		Urban Sample		Rural Sample	
Community Bank Number	0.045***	0.105***	0.045***	0.136***	0.042***	0.109***
	(0.009)	(0.029)	(0.010)	(0.043)	(0.016)	(0.024)
Age of Head of Household	-0.001	-0.000	-0.001	-0.002	-0.004	0.001
	(0.005)	(0.005)	(0.006)	(0.006)	(0.010)	(0.010)
Age Sq. of Head of Household	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Head of Household Is Male	-0.044**	-0.032	-0.042**	-0.026	-0.026	-0.016
	(0.020)	(0.020)	(0.021)	(0.022)	(0.045)	(0.044)
Single	-0.134***	-0.138***	-0.136***	-0.137***	-0.139**	-0.155**
	(0.029)	(0.028)	(0.030)	(0.029)	(0.065)	(0.064)
No Schooling	0.073*	0.067*	0.018	0.010	0.052	0.047
	(0.041)	(0.040)	(0.061)	(0.059)	(0.052)	(0.051)
Primary	0.164***	0.143***	0.090	0.060	0.185***	0.169**
	(0.044)	(0.044)	(0.061)	(0.060)	(0.070)	(0.070)
High School	0.279***	0.231***	0.231***	0.181***	0.215**	0.055

	(0.047)	(0.048)	(0.064)	(0.064)	(0.090)	(0.109)
College	0.359***	0.316***	0.325***	0.293***	0.244**	-0.003
	(0.081)	(0.085)	(0.093)	(0.097)	(0.111)	(0.083)
Risk Preferred	0.068***	0.058**	0.092***	0.085***	0.025	0.014
	(0.024)	(0.023)	(0.026)	(0.026)	(0.045)	(0.045)
Risk Averse	-0.044**	-0.042**	-0.016	-0.011	-0.073**	-0.077**
	(0.018)	(0.018)	(0.019)	(0.019)	(0.034)	(0.035)
Young Dependency Ratio	-0.047*	-0.049*	-0.060*	-0.055*	-0.029	-0.031
	(0.025)	(0.025)	(0.032)	(0.033)	(0.040)	(0.040)
Old Dependency Ratio	-0.019	-0.025	-0.005	-0.015	-0.036	-0.033
	(0.029)	(0.029)	(0.034)	(0.036)	(0.051)	(0.050)
Household Size	0.072***	0.079***	0.072***	0.082***	0.074***	0.082***
	(0.007)	(0.007)	(0.009)	(0.009)	(0.010)	(0.010)
Self-employed	0.155***	0.126***	0.148***	0.119***	0.157***	0.130***
	(0.021)	(0.021)	(0.023)	(0.025)	(0.043)	(0.044)
Ln (Housing Assets)	0.011***	-0.005	0.009***	-0.010**	0.023***	0.010
	(0.002)	(0.003)	(0.002)	(0.004)	(0.006)	(0.007)
Ln (Financial Assets)	0.044***	0.032***	0.042***	0.028***	0.046***	0.037***
	(0.004)	(0.004)	(0.004)	(0.005)	(0.006)	(0.007)
Ln (Total Income)	0.349***	0.319***	0.332***	0.297***	0.360***	0.338***
	(0.010)	(0.011)	(0.012)	(0.013)	(0.017)	(0.018)
Ln (Per capita GDP)	0.056**	0.045	0.054	0.051	0.102*	0.086*
	(0.028)	(0.027)	(0.038)	(0.039)	(0.052)	(0.050)
Rural	-0.190***	-0.041				
	(0.039)	(0.062)				
N	6549	6549	4026	4026	2523	2523
R^2	0.542	0.539	0.487	0.472	0.456	0.451
adj. R^2	0.539	0.536	0.482	0.466	0.447	0.442
Fstatistics 1st stage regression		306.56		83.79		57.18
t- statistics of instrument		27.04		18.09		25.00
p-value exogeneity test		12.76(0.00)		15.62(0.00)		10.55(0.00)

Dependent variable is the logarithm of total consumption. Robust standard errors clustered at the county level are in parenthesis. *=10% significance, **=5% significance, ***=10% significance.

However, there are several potential problems in relying on the OLS estimates in column 1. First, the number of bank branches in or around a community may be measured with substantial error. As we have argued before, the number of banks in a community is constructed by counting the number of opened bank time deposit and demand deposit accounts of all interviewed households in each community. It is approximately the number of bank branches whose financial services can be enjoyed by the households living in this community rather than the number of bank branches in or around this community. Thus, it may overestimate households' actual access to financial services and thus OLS estimates may be biased downward. On the other hand, there may be reverse causality problems. Financial institutions are more likely to open new branches in areas with higher consumption levels. As a result, OLS estimates in column 1 may be biased upward. In either case, we cannot simply rely on the estimates reported in column 1 of Table 3 to assess the effect of the number of community banks.

To solve these problems, we choose population density as the instrument variable of the number of community banks. To ensure that the instrument variable is exogenous with respect to household consumption, we use population density from the year 2000. The t statistics of instrument variable and the F-statistics of the first stage regressions reported in column 2 of Table 3 in the bottom panel indicate that not only are our instrument variables statistically significant, but the aforementioned F-statistics are the value recommended to avoid the weak instrument problem. Moreover, the exogeneity test is rejected. Thus, the OLS estimates differ significantly from the IV estimates. The IV estimates in the second stage reported in column 2 of Table 4 show that the relationship between the number of banks in a community and total household consumption remains positive and statistically significant. Overall, our estimates indicate that access to financial services is an important determinant of household consumption.

In consideration of the regional heterogeneity of access to financial services, we divide the full

sample into an urban sample and a rural sample according to the place of residence. Then, we replicate the OLS estimation using both subsamples. The estimates are reported in column 3 to column 6 of Table 3. We can see that results remain the same: improved access to financial services has a positive and significant effect on consumption, both in urban and rural areas. However, we do not find any significant difference in the impact of financial accessibility on household consumption between urban and rural areas.

Access to Financial Services and Household Consumption Structure

The China Household Finance Survey (CHFS) collects detailed and comprehensive information about household consumption; this allows us to further investigate the impact of access to financial services on the changing of household consumption structures. According to the Household Consumption Expenditure Classification (2013) standard released by China's National Bureau of Statistics (NBS), we divide total household consumption into seven parts including food consumption, clothing consumption, living consumption, everyday consumption, transportation and communication consumption, education and entertainment consumption, and other consumption. The detailed definition of each type of consumption is presented in Table 5.

Table 5 shows the estimates of the effects of the number of community banks on household consumption structure change. The dependent variables are the ratios of each type of consumption accounts to total consumption. OLS estimates are reported in the above panel of Table 5. We find that the number of banks in a community only has a significantly positive effect on the proportion of living consumption account to the total consumption. Since the OLS estimates may be biased due to measurement errors and reverse causality, we also estimate the regressions using an instrument variable (IV) approach: the two-stage least square technique. Results are shown in the bottom panel of Table 5. The instrument variable used is the population density from the year 2000. Column 1 in the bottom panel estimates the effect of the number of banks in a community on the proportion of food consumption account to total consumption. The exogeneity test is rejected, and the estimates in column 1 are negative and statistically significant, indicating that the number of banks in a community has a decreasing effect on the proportion of food consumption. The proportion of food consumption to total consumption is also called Engel's Coefficient. Thus, the estimates in Column 1 of the bottom panel indicate that improved access to financial services will decrease the Engel's coefficient. This may be the result of economic growth driven by financial development. Estimates in the bottom panel of column 2 show that improved access to financial services have no significant impact on food consumption. Exogeneity tests are all rejected in column 3 to column 5 in the bottom panel, and the estimates indicate that improved access to financial services has an increasing effect on the proportion of living consumption and the proportion of everyday consumption. It also has a decreasing effect on the proportion of transportation and communication consumption. Column 5 estimates the effect of community bank number on the proportion of education and training consumption in total consumption; both the OLS estimates and IV estimates are insignificant. Thus, access to financial services has no significant impact on the proportion of education and training consumption. Overall, our estimates indicate that improved access to financial services will significantly alter households' consumption structures, shown as the decrease of the proportion of food consumption and transportation-communication consumption of the total consumption and the increase of the proportion of living consumption and everyday consumption.

Table 5 Access to Financial Services on Household Consumption Structures

	(1) Food_ratio	(2) Cloth_ratio	(3) Liv_ratio	(4) Everyday_ratio	(5) Trans_ratio	(6) Edu_ratio
Community Bank Number	-0.002	-0.001	0.005**	-0.000	-0.002	-0.000
	(0.003)	(0.001)	(0.002)	(0.001)	(0.002)	(0.001)
N	6549	6549	6549	6549	6549	6549
R^2	0.095	0.098	0.065	0.028	0.060	0.051
adj. R^2	0.089	0.092	0.058	0.021	0.053	0.044
	(1) Food_ratio	(2) Cloth_ratio	(3) Liv_ratio	(4) Everyday_ratio	(5) Trans_ratio	(6) Edu_ratio
Community Bank Number	-0.020**	-0.004	0.025***	0.003*	-0.011**	0.006
	(0.009)	(0.003)	(0.008)	(0.002)	(0.005)	(0.005)
N	6549	6549	6549	6549	6549	6549

R^2	0.083	0.095	0.034	0.024	0.054	0.048
adj. R^2	0.077	0.089	0.027	0.017	0.047	0.041
Fstatistics of 1st stage regression	290.23	290.23	290.23	290.23	290.23	290.23
t- statistics of instrument	26.12	26.12	26.12	26.12	26.12	26.12
p-value exogeneity test	4.53(0.03)	1.92(0.17)	9.37(0.00)	3.45(0.06)	3.40(0.07)	2.27(0.13)

Robust standard errors clustered at the county level are in parenthesis. *=10% significance, **=5% significance, ***=10% significance. The top panel shows the OLS estimates and the bottom panel shows the IV estimates. All regressions include the head of household's demographic variables, household characteristics, and regional factors. For simplicity, we only report the focus variable in the table.

Access to Financial Services and Household Consumption Patterns

The rapid development of the financial sector is accompanied by the innovation of financial tools, and advanced technologies are widely used in the financial service system, such as the popularization of Automated Teller Machine (ATM), Point of Sale (POS), and E-bank. Thus, financial development might have some effect on households' consumption patterns, including consumption habits and consumption concept. Therefore, we further investigate this relationship in this section.

As mentioned before, three dummy variables are defined to measure households' consumption patterns, including: whether families a) own active credit cards; b) consume with non-cash payment; and c) suffer from loan constraints. The Probit model is used to estimate the effect of the number of community banks on households' consumption pattern. The model is set as below:

$$y = 1(\alpha + \beta * Financial\_Accessibility + \gamma X + \varepsilon > 0) \quad (2)$$

Where *Consump* denotes total household consumption in 2010. *Financial_Accessibility* represents the access to financial services and is measured by the number of bank branches in or around the community where a family resides. *X* represents other control variables, including household characteristics, head of household's demographic variables, and regional factors. $\epsilon$is the residual term. Considering the potential problems driven by measurement error and reverse causality problems in model (2), the Probit model using instrument variable (IV-Probit) is conducted to further confirm the relationship between access to financial services and household consumption patterns.

Table 6: Access to Financial Services and Household Consumption Behavior

	(1) Credit Card	(2) Card Consumption	(3) Loan Constrained
Community Bank Number	0.002	0.011***	-0.010**
	(0.003)	(0.004)	(0.005)
N	6345	6345	6549
PseudoR^2	0.321	0.344	0.114
	(1) Credit Card	(2) Card Consumption	(3) Loan Constrained
Community Bank Number	0.022**	0.021*	-0.054***
	(0.011)	(0.011)	(0.015)
N	6345	6345	6549
F-statistics of first stage regression	290.23	290.23	290.23
t- statistics of instrument	26.12	26.12	26.12
p-value exogeneity test	4.50(0.03)	1.07(0.30)	9.09(0.00)

Marginal effect is reported in the table. Robust standard errors clustered at the county level are in parenthesis. *=10% significance, **=5% significance, ***=10% significance. The top panel shows the Probit estimates and the bottom panel shows the IV-Probit estimates. All regressions include the head of household's demographic variables, household characteristics, and regional factors.

The estimates of the Probit model are reported in the above panel of Table 6, and the IV-Probit estimates are shown in the bottom panel. Column 1 estimates the effect of the number of community

banks on the likelihood of owing activated credit cards. The exogeneity test is rejected. Thus, the Probit estimates differ significantly from the IV-Probit estimates, and the IV-Probit estimates show that the number of banks in a community has a positive and statistically significant impact on the probability of using credit cards. This indicates that access to financial services is an important determinant of credit card use: those who have better access to financial services are more likely to own an active credit card. This may be because improved access to financial services affects residents' concept of consumption, transforming it from "live within your means" in the past to "excessive consumption" nowadays. Column 2 shows estimates of the effect of the number of banks in a community on the probability of non-cash payment consumption. Non-cash payment denotes payment using bank cards, including debit cards, credit cards, and semi-credit cards. The exogeneity test in column 2 in the bottom panel shows that the Probit estimates do not differ significantly from the IV-Probit estimates, and the results indicate that the improved access to financial services will promote non-cash payment consumption. The reason is that the electronic systems such as POS are more extensive in the area with better access to financial services (which greatly facilitate household consumption). This indicates that improved access to financial services also bring changes in the mode of payment.

Meanwhile, financial institutions are more competitive in areas with greater access to financial services; this reduces the barriers to financial services. That means households might obtain loans from financial institutions more easily. Households constrained by loans are defined as those who have a credit demand, but 1) do not apply for a loan for many reasons, such as lacking knowledge or subjectively thinking that they will be rejected even if they apply for a loan; 2) their loan application was rejected; or 3) they only get a portion of the money they want to borrow from financial institutions. Column 3 investigates this relationship, and both the Probit estimates and IV-Probit estimates show that households with more banks in and around the community are less likely to be loan constrained. This indicates that credit availability is higher in places with greater access to financial services, thus easing households' liquidity constraints.

Further Analysis

Above, we investigate the average impact of accessibility of financial services on household consumption, but this impact may be heterogeneous across different subgroups. In this section, we will investigate the mechanism of how financial accessibility affects household consumption from the perspectives of income, loan constraints, and participation in the financial market. Generally speaking, households with lower incomes are more likely to be loan constrained. Thus, the accessibility of financial services may have a larger effect on them, so we introduce the interaction term of community bank number and total household income into model (1) and the regression results are reported in column 1 and column 2 of Table 7. We find that the coefficient of the interaction term is positively significant. This confirms our aforementioned hypothesis and indicates that the marginal effect of income on household consumption will decrease with the improved accessibility of financial services.

The effect of the accessibility of financial services on the consumption of loan constrained households may be different from those who are not. Therefore, in column 3 and column 4 we introduce the interaction term of community bank number and the dummy variable indicating that a household is being loan constrained. Both the OLS and the IV-OLS estimates show that the effect of accessibility of financial services on consumption is larger for loan constrained households. This indicates that the improved accessibility of financial services will ease the inhibiting effect of loan constraints on household consumption.

An existing study by Yin et al (2013) found that the accessibility of financial services can promote household participation in the financial market. The wealth effect of participating in the financial market might stimulate households to consume more, so in column 5 and column 6, we introduce the interaction term of community bank number and the dummy variable indicating whether households participate in the financial market (1=participate; 0=not). The OLS estimates in column 5 show that the marginal effect of community bank number on consumption is larger for those who do not participate in the financial market. However, the exogeneity test reported in the bottom of column 6 is rejected. In the IV-OLS estimates, the estimate of the interaction term is still negative, but not statistically significant. Thus, we do not find that the effect of accessibility of financial services on consumption is different between those who participate in the financial market and those who do not.

Table 7: Heterogeneity Analysis

	(1) OLS	(2) IV_OLS	(3) OLS	(4) IV_OLS	(5) OLS	(6) IV_OLS
Community Bank Number	0.206***	0.341**	0.036***	0.104***	0.045***	0.112***

	(0.045)	(0.139)	(0.009)	(0.029)	(0.009)	(0.031)
Ln (Total Income)	0.402***	0.411***	0.346***	0.337***	0.344***	0.337***
	(0.018)	(0.037)	(0.010)	(0.011)	(0.010)	(0.011)
Ln (Total Income) *	-0.016***	-0.021*				
Community Bank Number	(0.004)	(0.011)				
Loan Constrained			-0.091*	-0.278***		
			(0.048)	(0.103)		
Loan Constrained *			0.013	0.077**		
Community Bank Number			(0.012)	(0.032)		
Financial Market					0.292***	0.291
Participation*					(0.065)	(0.182)
Financial Market					-0.048***	-0.051
Participation* Loan					(0.012)	(0.035)
Constrained						
N	6549	6549	6549	6549	6352	6352
R^2	0.547	0.535	0.547	0.533	0.548	0.539
adj. R^2	0.544	0.531	0.543	0.529	0.544	0.535
F-statistics of first stage		285.59/		278.54/		265.85/
regression		352.32		403.85		1364.01
t- statistics of instrument		4.74/10.70		25.85/29.26		23.95/29.77
p-value exogeneity test		6.31(0.00)		6.02(0.00)		4.00(0.02)

Dependent variable is a log of total consumption. Robust standard errors clustered at the county level are in parenthesis. *=10% significance, **=5% significance, ***=10% significance. All regressions include the head of household's demographic variables, household characteristics, and regional factors.

Robustness Check

In this section, we conduct several robustness checks to further support our argument that access to financial services is an important determinant of household consumption, and as a result, consumption structure and consumption patterns can also be affected.

The Measurement Issue

The measurement of access to financial services we used above is the number of bank branches in or around a community, while the definition of accessibility which is often used in medical literature, is a concept in the sense of per capita. Mookerjee and Kalipioni (2010) measured access to financial services by the number of bank branches per 100,000 people on a national level. Therefore, we construct another three measurements of access to financial services at the county level: the number of bank branches per 10,000 people, the number of ATMs per 10,000 people, and the number of security exchange per 10,000 people. We further analyze how financial accessibility affects household consumption. We discuss the estimates with financial accessibility measured by bank per 10,000 people which is reported in Panel A of Table 9. The coefficient of bank per 10,000 people is in each column is still positive and statistically significant, and both the coefficient of the interaction term of bank per 10,000 population and rural dummy in column 3 and column 4 are positively significant. This indicates that access to financial services has a larger increasing effect on household consumption in the rural areas. Panel B and Panel C show the estimates with financial accessibility measured by ATM per 10,000 population and stock exchange per 10,000 populations. They are similar with the estimates to Panel A, so we do not discuss the details here.

Table A2 and Table A3 show the estimates of financial accessibility and household consumption behavior as well as consumption structure by using the other three per capita definitions of financial accessibility. The results are consistent with what we found above: that improved access to financial services will decrease the proportion of food consumption, clothing consumption, and transportation consumption of the total consumption, and increase the proportion of living consumption and everyday consumption of the total consumption. Table A4 shows the estimates of the robustness check of heterogeneous analysis. All the estimates are consistent with what we found before.

Does Financial Accessibility Really Matter?

Due to the rapid expansion of internet and the electronic development of financial services, residents can also consume through e-banks even if no financial institutions are around. To exclude this situation, we use samples without computers to further confirm our arguments. The results are reported in Table 8. We find that the coefficient of community bank number is still positive and statistically significant. This indicates that improved accessibility of financial services matters for household consumption.

Table 8 Accessibility of Financial Services and Total Consumption: Samples without Computer at Home

	(1)	(2)	(3)	(4)
Community Bank Number	0.021**	0.104***	0.016	0.120***
	(0.009)	(0.035)	(0.010)	(0.044)
Rural	-0.089*	0.094	-0.158**	0.284
	(0.046)	(0.081)	(0.075)	(0.197)
Community Bank Number * Rural			0.021	-0.055
			(0.019)	(0.038)
N	2847	2847	2847	2847
R^2	0.415	0.399	0.415	0.393
adj. R^2	0.405	0.389	0.405	0.382
F-statistics of first stage regression		79.49		89.18/422.26
t- statistics of instrument		18.79		14.81/62.64
p-value exogeneity test		23.26(0.00)		11.28(0.00)

Dependent variable is a log of total consumption. Robust standard errors clustered at the county level are in parenthesis. *=10% significance, **=5% significance, ***=10% significance. All regressions include the head of household's demographic variables, household characteristics, and regional factors.

Conclusion

In this paper, we investigate the impact of access to financial services on household consumption, using the instrument variable approach to solve the measurement error and reverse causality problems. We find that access to financial services is a significant determinant of household consumption by using data from the China Household Finance Survey (CHFS) in China. The different measures of financial accessibility (including community bank numbers, banks per 10,000 people, ATMs per 10,000 people, and stock exchanges per 10,000 people) all show that a lack of access to financial services greatly restrains household consumption. Considering the unbalanced development of financial institutions in different areas, we show that the effect of access to financial services is much larger in the rural areas. We also find that the effect of financial accessibility on household consumption is higher for those with lower incomes, loan constraints, and those who do not participate in the financial market.

We next study the effect of financial accessibility on household consumption structure. We find that improved access to financial services increase the proportion that living consumption and everyday consumption comprise of the total consumption, and decrease the proportion of food consumption and transportation and communication consumption of the total consumption. We also find that improved access to financial services can influence residents' consumption patterns, mainly presented as using credit cards, consuming with non-cash payment, and better credit availability.

Our results suggest that a lack of access to financial services is a significant deterrence to household consumption. The different measures of financial accessibility, including the number of banks in communities, banks per 10,000 people, ATMs per 10,000 people, and stock exchange per 10,000 people, all show that a lack of access to financial services greatly restrains residents' consumption. Improved access to financial services can decrease the sensitivity of consumption to current income and also inhibit the effects of loan constraints. The promotion of comprehensive and balanced development of financial institutions is an important measure to stimulate household consumption. The under-developed and unbalanced development of the financial market not only restrains household consumption, but also hinders China's economic growth and structural transformation. The government should reasonably regulate the development of financial institutions.

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Appendix

Table: A1 Definition and Descriptive Statistics of Variables

Variable	Definition	Mean	Standard Error	Min	Max
Regional variables					
Community Bank Number	Number of bank branches in and around a community	3.68	2.08	0	9
Per Capita GDP	The per capita GDP	25000	21200	2700	84500
Rural	Whether a family lives in urban area or rural area	0.39	0.49	0	1
Household Characteristics					
Total Consumption	Annual family consumption	40600	41100	1200	304700
Net Worth	Total asset minus annual debt	628500	1608600	0	68600000
Total Income	Annual income	56000	96100	1000	2189200
Credit Consumption	Whether family has an active credit card	0.15	0.35	0	1
Bank Card Consumption	Pay by bank cards	0.18	0.38	0	1
Loan Constraint	Family has loan demand but their application is rejected	0.19	0.40	0	1
Household Size	Family numbers	3.65	1.46	1	10
Young Dependency Ratio	$\frac{\text{Number of people aged 1 to 14}}{\text{Number of people aged 15 to 65}}$	0.23	0.34	0	3
Old Dependency Ratio	$\frac{\text{Number of people aged over 65}}{\text{Number of people aged 15 to 65}}$	0.13	0.32	0	3
Risk Preferred	The principal is risk prefer	0.14	0.35	0	1
Risk Neutral	The principal is risk neutral	0.27	0.45	0	1
Risk Averse	The principal is risk averse	0.57	0.49	0	1
House	Whether family own house(s)	0.23	0.42	0	1
Self-employed	1 represents a family engages in self-business , otherwise 0	0.14	0.35	0	1
Head of Household Demographic Variables					
Head Age	Age of head of household	47.78	11.97	16	79.83
Head is Male	Head of household is male	0.74	0.44	0	1
No School	The head of a family had never attend school	0.07	0.23	0	1
Primary	The education level of household head is primary or middle school	0.56	0.50	0	1
High School	The education level of the household head is high or vocational school	0.21	0.41	0	1
College	The education level of household head is college or undergraduate	0.15	0.36	0	1
Master	The education level of the principal of a family is a master's or PhD	0.01	0.11	0	1

Table A2 Access to Financial Services and Total Consumption: Measured by Per Capita Definition

	(1) OLS	(2) IV_OLS	(3) OLS	(4) IV_OLS
Panel A: Bank per 10,000 Populations				
Bank per 10,000 Populations	0.036***	0.044***	0.028***	0.038***
	(0.008)	(0.011)	(0.007)	(0.010)
Rural	-0.239***	-0.234***	-0.305***	-0.286***
	(0.030)	(0.029)	(0.033)	(0.034)
Bank per 10,000 Populations * Rural			0.051***	0.040***
			(0.011)	(0.010)
N	6549	6549	6549	6549
R^2	0.546	0.546	0.547	0.547
adj. R^2	0.543	0.543	0.544	0.544
F-statistics of first stage regression		466.20		490.05/1159.68
t- statistics of instrument		75.15		70.17/172.33
p-value exogeneity test		1.64(0.20)		1.39(0.25)
Panel B: ATM per 10,000 Population				
ATMs per 10,000 Populations	0.028***	0.030***	0.021***	0.026***
	(0.005)	(0.007)	(0.005)	(0.007)
Rural	-0.243***	-0.241***	-0.296***	-0.275***
	(0.029)	(0.028)	(0.029)	(0.030)
ATMs per 10,000 Population * Rural			0.035***	0.023***
			(0.009)	(0.006)
N	6549	6549	6549	6549
R2	0.547	0.546	0.548	0.548
adj. R2	0.543	0.543	0.545	0.545
F-statistics of first stage regression		523.57		555.46/999.40
t- statistics of instrument		77.89		72.87/177.68
p-value exogeneity test		0.34(0.56)		5.61(0.00)
Panel C: Stock Exchanges per 10,000 Populations				
Stock Exchanges per 10,000 Populations	0.123***	0.155***	0.090***	0.131***
	(0.031)	(0.039)	(0.029)	(0.038)
Rural	-0.256***	-0.255***	-0.283***	-0.275***
	(0.029)	(0.029)	(0.028)	(0.029)
Stock Exchanges per 10,000 Population * Rural			0.196***	0.150***
			(0.043)	(0.038)
N	6549	6549	6549	6549
R2	0.545	0.545	0.547	0.546
adj. R2	0.542	0.542	0.543	0.543
F-statistics of first stage regression		355.54		377.60/3154.27
t- statistics of instrument		88.94		83.91/341.57
p-value exogeneity test		2.94 (0.09)		2.22(0.11)

Dependent variable is a log of total consumption. Robust standard errors clustered at the county level are in parenthesis. *=10% significance, **=5% significance, ***=10% significance. All regressions include the head of household's demographic variables, household characteristics, and regional factor

Table A3 Accessibility of Financial Services and Consumption Behavior: Measured by Per Capita Definition

	(1) Food_ratio	(2) Cloth_ratio	(3) Liv_ratio	(4) Everyday_ratio	(5) Trans_ratio	(6) Edu_ratio	(7) Credit card	(8) Card consumption	(9) Loan constraint
Panel A: Banks per 10,000 Populations									
Bank per 10,000 Populations	-0.009** (0.003)	-0.002** (0.001)	0.010*** (0.002)	0.002*** (0.001)	-0.003** (0.002)	0.002 (0.001)	0.006** (0.003)	0.009*** (0.003)	-0.019*** (0.004)
R^2	0.099	0.100	0.072	0.029	0.061	0.051	6345	6345	6549
adj. R^2	0.092	0.093	0.065	0.022	0.054	0.044			
pseudo R^2							0.323	0.344	0.115
Panel B: ATM per 10,000 Populations									
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
ATM per 10,000 Populations	-0.009** (0.002)	-0.001** (0.000)	0.008*** (0.001)	0.001*** (0.000)	-0.002 (0.001)	0.002** (0.001)	0.006*** (0.002)	0.007*** (0.003)	-0.017*** (0.003)
R^2	0.102	0.099	0.073	0.029	0.060	0.051	6345	6345	6549
adj. R^2	0.095	0.093	0.066	0.022	0.053	0.045			
pseudo R^2							0.323	0.345	0.117
Panel C: Stock Exchanges per 10,000 Populations									
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Stock Exchanges per 10,000 Populations	-0.046** (0.010)	-0.005** (0.002)	0.040*** (0.008)	0.007*** (0.003)	-0.012** (0.006)	0.011** (0.005)	0.023** (0.011)	0.026* (0.014)	-0.105*** (0.016)
R^2	0.101	0.099	0.072	0.029	0.061	0.051	6345	6345	6549
adj. R^2	0.095	0.092	0.066	0.022	0.054	0.045			
pseudo R^2							0.322	0.343	0.118

Table A4 Heterogeneous Analyses: Measured by Per Capita Definition

	(1) OLS	(2) IV_OLS	(3) OLS	(4) IV_OLS	(5) OLS	(6) IV_OLS
Panel A: Banks per 10,000 Populations						
Banks per 10,000 Population	0.197*** (0.058)	0.261*** (0.101)	0.033** (0.008)	0.040*** (0.010)	0.041** (0.009)	0.055*** (0.014)
Ln (Income)	0.371*** (0.013)	0.378*** (0.018)	0.343*** (0.010)	0.342*** (0.010)	0.343*** (0.011)	0.342*** (0.011)
Bank per 10,000 Population * Ln (Income)	-0.014** (0.005)	-0.019** (0.009)				
Loan constrained			-0.124*** (0.033)	-0.145*** (0.050)		
Bank per 10,000 Population * Loan Constrained			0.057** (0.014)	0.074** (0.033)		
Financial Market Participation					0.101** (0.038)	0.171** (0.081)
Bank per 10,000 Populations * Financial Market Participation					-0.018* (0.010)	-0.041 (0.025)
N	6549	6549	6549	6549	6352	6352
R^2	0.547	0.547	0.547	0.547	0.547	0.546
adj. R^2	0.544	0.543	0.544	0.544	0.543	0.543
F-statistics of first stage regression		478.66/ 526.30		448.34/ 250.50		442.01/ 431.45
t- statistics of instrument		-3.69/ 23.77		74.54/50.51		68.05/40.72
p-value exogeneity test		1.10(0.33)		1.01 (0.36)		1.14(0.32)
Panel B: ATM per 10,000 Populations						
ATM per 10,000 Populations	0.140*** (0.039)	0.177*** (0.066)	0.025** (0.005)	0.028*** (0.007)	0.030** (0.006)	0.037*** (0.009)
Ln (Income)	0.365*** (0.012)	0.370*** (0.015)	0.342*** (0.010)	0.341*** (0.010)	0.342*** (0.011)	0.342*** (0.011)
ATM per 10,000 Populations * Ln (Income)	-0.010** (0.004)	-0.013** (0.006)				
Loan Constrained			-0.102*** (0.029)	-0.119*** (0.040)		
ATM per 10,000 Population * Loan			0.042**	0.057** (0.024)		

Constrained			(0.010)			
Financial Market Participation					0.076***	0.136** (0.059)
					(0.035)	
ATMs per 10,000 Populations * Financial Market Participation					-0.009 (0.007)	-0.024* (0.014)
N	6549	6549	6549	6549	6352	6352
R^2	0.548	0.547	0.548	0.548	0.547	0.547
adj. R^2	0.544	0.544	0.544	0.544	0.544	0.543
F-statistics of first stage regression		544.88/584.08		504.96/152.65		501.26/370.55
t- statistics of instrument		-5.53/26.85		77.47/49.06		70.62/46.99
p-value exogeneity test		0.34(0.71)		0.47(0.62)		1.09(0.34)
Panel C: Stock exchange per 10,000 population						
Stock exchange per 10,000 population	0.846*** (0.305)	1.285*** (0.478)	0.112*** (0.030)	0.134*** (0.038)	0.131*** (0.038)	0.205*** (0.057)
Ln(income)	0.356*** (0.011)	0.361*** (0.012)	0.345*** (0.010)	0.344*** (0.010)	0.344*** (0.011)	0.343*** (0.011)
Stock exchange per 10,000 population*Ln(income)	-0.063*** (0.027)	-0.099** (0.041)				
Loan constrained			-0.068*** (0.025)	-0.080*** (0.028)		
Stock exchange per 10,000 population*Loan constrained			0.274*** (0.083)	0.481** (0.224)		
Financial market participation					0.050* (0.027)	0.094** (0.037)
Stock exchange per 10,000 population**Financial market participation					-0.025 (0.041)	-0.154* (0.093)
N	6549	6549	6549	6549	6352	6352
R^2	0.546	0.546	0.546	0.546	0.546	0.545
adj. R^2	0.543	0.543	0.543	0.543	0.543	0.542
F-statistics of first stage regression		392.12/408.52		345.80/76.70		349.02/197.95
t- statistics of instrument		-9.78/31.20		89.19/50.18		80.11/47.62
p-value exogeneity		1.18(0.31)		2.08(0.13)		3.09(0.05)

test

Dependent variable is log of total consumption. Robust standard errors clustered at the county level in parenthesis. *=10% significance, **=5% significance, ***=10% significance. All regressions include household head demographic variables, household characteristics, and regional factors.