

# Happiness or Burden: An Analysis Based on Chinese Household Borrowing Behavior

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**Abstract:** As one of the main household financial behaviors, borrowing behavior plays an increasingly critical role in economic activities, which has an important impact on household economic welfare and the subjective feelings of individuals. From the data of the China Household Finance Survey (CHFS) in 2017, this paper empirically analyzes the impact of household borrowing behavior on residents' subjective well-being. The results show that borrowing could reduce individual happiness, and this inhibitory effect mainly originates from informal borrowing behavior, while the occurrence of formal borrowing can promote individual subjective well-being. Meanwhile, the development of regional digital finance as well as the enhancement of individual financial literacy can mitigate the inhibitory effect of borrowing behavior on happiness. Further analyses find that when individuals have a cognitive bias on their own debt, that is, when individuals are optimistic about debts exceeding the household ability to repay, happiness will decrease significantly.

**Key words:** borrowing behavior; happiness; formal borrowing behavior; informal borrowing behavior; financial literacy

**JEL Classification:** D14; I31

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## 1. Introduction

In recent years, the living standards of Chinese residents have been greatly improved, which is closely related to the high-quality development of China's economy. At the same time, Chinese people desire a more prosperous life, including the demand for material life and spiritual life. According to the World Values Survey, the overall happiness ratio of Chinese showed a large growing trend from 1990 to 2020, and the micro-data based on China Household Financial Survey (CHFS) revealed that the percentage of happy households increased from 56.7% in 2013 to 67.3% in 2019. However, in terms of horizontal comparison, World Happiness Report (2021) released by the United Nations showed that China's happiness index ranks the 72th out of 146 participating countries and regions, with a happiness index 5.585, indicating the sense of residents' happiness still needs improvement.

Neoclassical economics often measure the individual satisfaction or happiness according to utility, meaning that individuals always make behavioral decisions with the objective of maximizing their own utility, hence, the increase in utility brought by individuals in the process or result of the behavior is considered as the improvement of the happiness or satisfaction. As one of the most important financial behaviors of households, borrowing behavior plays a critical role in residents' lives. From a macro perspective, the stability of the leverage ratio of

the household sector is of great significance for economic growth and the orderly operation of macro-economy. From a micro perspective, the acquisition of debt can ease the liquidity constraints, meet current capital needs, and improve individual happiness in life. However, the accumulation of debt could increase the burden and the financial vulnerability of household. That is to say, not only can excessively borrow cause serious psychological and social consequences, the negative externalities it generates may eventually be transmitted to the macro level and even induce the financial crises (Jia et al., 2021; Jeanne & Korinek, 2019). Therefore, household borrowing behavior may bring about an increase in individual subjective well-being, or may lead to a decrease in happiness.

How to correctly guide individual borrowing behavior, maximize the positive impact and reduce the risk caused by borrowing plays a primary role in enhancing the subjective well-being of individuals. Thus, this paper intends to analyze the relationship between household borrowing behavior and individual subjective well-being by using data from the 2017 China Household Finance Survey (CHFS). The contribution to the literature includes three aspects. Firstly, by analyzing the main effect that borrowing behavior has on individual happiness and distinguishing the sources of borrowing, this paper found that formal borrowing can improve individual subjective well-being, while the inhibitory effect comes mainly from informal borrowing, which provides a certain basis for advocating the development of a formal credit market. Secondly, the deviation of subjective and objective debts can reduce individual happiness, by recognizing the subjective debt on whether the family members have repayment pressure, indicating that it is crucial to raise individual awareness of risk in borrowing behavior. The third contribution is to document a significant effect that the development of digital finance and the improvement of individual financial literacy can alleviate the inhibitory effect of borrowing behavior on happiness, thus providing some policy advice about maximizing the effectiveness of borrowing for regions and individuals.

## 2. Literature Review and Hypothesis Proposition

### 2.1. Literature Review

Nowadays, with the continuous improvement of financial market, changes in consumption concepts and the diversified needs for asset allocation, borrowing plays a prominent role in household financial behavior, making debt a core composition of household resources (Berger & Houle, 2016). Therefore, the relationship between household debt status and happiness has gradually been paid attention by scholars. Related studies are mostly carried out from two branches. The first strand of literature emphasizes the influence of the actual amount of household debt on happiness, forming two distinct conclusions, "promotion" or "inhibition". In the "promotion theory", credit is regarded as a factor of production, which can improve the individual income level. It is documented that borrowing within a reasonable range can effectively improve life satisfaction of individuals. However, once the debt is beyond the range, it may damage personal welfare, accordingly increase household financial vulnerability, and even lead to household debt crisis, that is the view of "inhibition". The research of Wu et al., (2018) has proved that excessive debt will lead to some rural households

“becoming impoverished due to debt”, which may have a detrimental impact on household consumption and individual happiness.

The other strand of literature focuses on individual subjective debt burden, highlighting the negative impact of debt on mental health (Selenko & Batinic, 2011; Keese & Schmitz, 2014). Household debt often causes individual anxiety (Archuleta et al., 2013), such as the repayment pressure, which reduces individual happiness by affecting health (Balmer et al., 2006). Especially for groups who cannot effectively manage the debt, they do not have the ability to achieve their personal goals or improve their consumption capacity and financial flexibility through debt. Instead, it is easy to lead to the accumulation and duration of debt (Clayton et al., 2015), increasing household debt repayment pressure and reducing individual life well-being (Norvilitis et al., 2003).

Overall, as one of the important financial behaviors, borrowing has attracted much attention on individual happiness, and large body of related studies have yielded abundant achievements, but differences in the development situation, cultural background and individual habits of various countries may lead to various manifestations in China. Hence, based on the reality of Chinese household borrowing behavior, it is of certain theoretical and practical guiding significance to explore whether it can improve the happiness of individuals in China.

## *2.2. Hypothesis Proposition*

According to the analysis of existing literature, borrowing can meet the household instant financial needs, and ease liquidity constraints. Besides, through credit acquisition, kinds of activities such as entrepreneurship can increase income, which positively affects individual well-being. Therefore, relaxing credit constraints has positive implications for improving the financial market participation of individuals and enhancing their optimistic expectancy for the future (Luo et al., 2021), illustrating that borrowing has positive effect. However, borrowing behavior is often driven by materialistic pursuits (Crain & Ragan, 2012), rather than improving the household welfare, such groups are more prone to perform conspicuous consumption due to the ratchet effect, which leads to the household taking on more debt for consumption to keep up with the Joneses. These negative effects may increase household financial vulnerability and expose them to greater risks, reducing individual life satisfaction.

At present, irrespective of China’s credit market developing and prospering, residents’ financial literacy is still relatively poor, and their cognition of financial market needs improving. Some groups are unable to actively and effectively deal with the uncertainty in economic activities, and fail to recognize the risks accompanying household indebtedness reasonably, which limit the positive effects of borrowing due to unreasonable behaviors (Wu et al., 2021). This motivates the first hypothesis, which relates to whether borrowing behavior is associated with lower happiness.

Hypothesis 1: The occurrence of borrowing behavior will reduce individual subjective well-being.

The sources of borrowing behavior include formal and informal. Formal borrowing generally refers to loans from banks and other formal financial institutions, while informal mainly comes from private borrowing, including some debt from non-financial institutions, which generally has the characteristics of short maturity and high interest rate. Although all types of loans are obtained to meet the household immediate financial needs, households under informal borrowing may face much greater repayment pressure, and even crowd out daily consumption due to the time constraint to repay loans (Chen, 2017), which may reduce individual subjective well-being. Most of the debt obtained from relatives and friends do not require interest payment and have no fixed repayment period, but family members will bear a large psychological burden and feel a personal desire to repay in the short term, that is to say, informal borrowing has piled great pressure on individuals, so the happiness effect from such loans is weaker and may even be negative.

In contrast, loans from formal financial institutions generally have longer and fixed terms, furthermore, the institutions have systematically evaluated and confirmed the repayment ability of individuals before their loans are granted, and some of the loans are secured. It indicates that formal borrowing is mostly within the affordable range of the household economic situation, which is with relatively lower repayment pressure. Thus, formal borrowing behavior can effectively play a positive role of indebtedness., this motivates the second hypothesis:

Hypothesis 2: The positive effect of borrowing behavior on happiness mainly comes from the formal borrowing while the negative effect is from informal borrowing behavior.

### 3. Research Design

#### 3.1. *Data Sources and Sample Selection*

This paper constructed the sample by using the data from China Household Finance Survey (CHFS), which is conducted every two years by Survey and Research Center for China Household Finance at Southwestern University of Finance and Economics, and it has collected data form six rounds of surveys in 2011, 2013, 2015, 2017, 2019 and 2021. However, the latest survey data in 2021 is not yet fully available, meaning that requests for access to data cover from 2011 to 2019. Meanwhile, considering the research object and specific variables selection requirements in this paper, and ensuring as large a sample size as possible, this paper finally choose the fourth round of surveys in 2017. Given that the head of household knows the most approximately the household economic situation and makes decisions, the samples are restricted to answers from the heads of household. Besides, this paper also obtained data from China Statistical Yearbook for control variables at the provincial level. After excluding samples with missing information about head of the household, missing statistical values of core variables, and abnormal values, a total of 19,177 samples were obtained.

#### 3.2. *Variables*

1. Explained variable,

Following the related research, this paper uses the index for self-reported values to measure individual subjective well-being. Specifically, the CHFS asks respondents the question to report the level of their happiness: "In general, do you feel happy now?". One being the least level of happiness and five being the highest level of happiness. Accordingly, option 1 and 2 were assigned to 1, and option 3, 4 and 5 were assigned to 0. So, the variable *Hap* (Happiness) means "are you happy or not", the value of 1 means happy and 0 means unhappy.

## 2. Explanatory variables,

The selection of independent variables in this paper includes the following aspects: First, in CHFS, individuals are asked whether they have a loan for any of the reasons, including agriculture, industry and commerce, housing, shops, automobiles, luxury goods, financial products, education, and other factors, so this paper defined a dummy variable *BB* (borrowing behavior). When the household borrows due to any one or more of the nine categories of factors, the indicator of *BB* equals to 1 and 0 otherwise. Second, the question that whether households borrow due to factors including industry and commerce, housing, shops, automobiles, financial products, and education can differentiate the source, so the variable *BB<sub>1</sub>* (borrowing behavior<sub>1</sub>) was used to measure whether household borrows due to at least one of the six categories. Third, to test the hypotheses related to the borrowing source, *F\_BB<sub>1</sub>* was generated as a dummy equal to one if household has formal borrowing due to any one or more of these six factors, similarly, a dummy variable *IF\_BB<sub>1</sub>* was defined.

## 3. Control variables,

Drawing on existing research, other variables may also influence individual subjective well-being either directly or indirectly. Considering the data availability, this paper selected a series of control variables regarding individual level, household level, district and county level, and province level, respectively. Table 1 provides the definitions and measures of the control variables.

### 3.3. Empirical Strategy

To examine the impact of household borrowing behavior on individual subjective well-being, this paper applied econometric model to testing the hypothesis. Since the explained variable is dummy variable, a discrete choice model is selected, hence, this paper mainly uses the Probit model. The benchmark model is set as follows:

$$Hap_i = \alpha BB_i + \beta Controls_i + \varepsilon_i \quad (1)$$

In the above equation, *i* represents the individual in the sample, *Hap<sub>i</sub>* is a dummy variable with values of 0 and 1, and *BB<sub>i</sub>* refers to explanatory variable with values of 0 and 1. *Controls<sub>i</sub>* Refers to a set of control variables for the four dimensions of individual level of household head, household level, district and county level and provincial level mentioned above. In order to eliminate the possible heteroskedasticity of the model, indicators such as the

assets, cash, transportation and communication expenses, durable goods expenditure, per capita GDP and per capita disposable income are processed logarithmically.

Table1. Definition and measures of variable descriptions

Variable	Index	Definition
Gender	<i>Gen</i>	1 = men, 0 = women
Age	<i>Age</i>	Age of the individual
Age squared	<i>Age<sup>2</sup></i>	Age squared of the individual
Marital status	<i>Mar</i>	1 = married, cohabiting and remarriage, 0 = unmarried, separated, divorced, and widowed
Health	<i>Hea</i>	Measured on a five-point scale, one is the least healthy and five is the healthiest
Education	<i>Edu</i>	Years of education
Party	<i>Par</i>	Whether the individual is a Communist Party member
Work	<i>Wor</i>	Whether the individual has a job
Internet	<i>Int</i>	Whether the individual uses the Internet
Social net	<i>Soc</i>	Household average monthly local transport and communications costs last year
Asset	<i>Ass</i>	Total household assets
Risk preference	<i>Rpr</i>	Whether the individual is risk preference type
Risk neutral	<i>Rne</i>	Whether the individual is risk neutral
Car	<i>Car</i>	Whether the household has a car
Production	<i>Pro</i>	Whether the household is engaged in industrial and commercial production and operation
Lend	<i>Len</i>	Whether the household has lent
Rural	<i>Rur</i>	Whether the household is a rural family
Economic information	<i>Inf</i>	Whether the individual pay attention to economic and financial information
Transfer spending	<i>Tsp</i>	Whether the household has transfer expenditure
Financial Product Value	<i>Fpv</i>	Total value of household financial products
Cash	<i>Cas</i>	Total household cash and deposits
Durable	<i>Dur</i>	Total value of household durable goods
Gini	<i>Gini</i>	Inequality of income for people at the county level
Family Size	<i>Pop</i>	The number of people who eat at the same cooking table
Pgdp	<i>Eco</i>	GDP per capita at the province level
Unemployment	<i>Une</i>	Unemployment at the provincial level
Urbanization	<i>Urb</i>	Urbanization rate of the province
Financial Development	<i>Fir</i>	(Regional premium income + various deposit balances of banking financial institutions + market value of stocks)/ GDP
U-income	<i>Uinc</i>	Per capita disposable income of urban residents at the provincial level
R-income	<i>Rinc</i>	Per capita net income of rural residents at the provincial level

## 4. Results

### 4.1. Baseline Results

This part first examines how borrowing behavior affects the happiness. The regression results are shown in Table 2, as Columns (1) and (2) reports, after controlling a series of control variables, both  $BB$  and  $BB_1$  are significantly and negatively associated with happiness, which

means that people are always unhappy with loans. As the marginal effects shows, the borrowing behavior will significantly reduce individual happiness by 2.6%, and the occurrence of household borrowing behavior measured by  $BB_t$  can reduce individual subjective well-being by about 2.5%. Hypothesis 1 can be verified.

Table 2. Baseline regression results

<i>Hap</i>	(1)	(2)	(3)	(4)	(5)	(6)	(7)
<i>BB</i>	-0.026*** (-3.67)	—			-0.028*** (-3.74)	—	-0.032*** (-3.62)
<i>BB<sub>t</sub></i>	—	-0.025*** (-3.24)			—	-0.028*** (-3.33)	—
<i>F_BB<sub>t</sub></i>			0.030* (1.68)				
<i>IF_BB<sub>t</sub></i>				-0.056*** (-3.36)			
Constant	—	—			0.341 (1.09)	0.348 (1.10)	—
N	19,177	19,177	3,900	3,900	19,177	19,177	19,175
R <sup>2</sup>	0.072	0.072	0.066	0.068	0.082	0.082	0.064

Note: The values in parentheses in Columns (1) through (4) is Z-statistics, the values in parentheses in Columns 5 through 7 is t-statistics. \*p < 0.1, \*\*p < 0.05, \*\*\*p < 0.01. Due to space limitations, this paper does not report the regression results of relevant control variables. The same below.

#### 4.2. Empirical Analysis Based on Differences in Debt Sources

To test the hypothesis 2, borrowing behavior was divided into formal borrowing behavior ( $F\_BB_t$ ) and informal borrowing behavior ( $IF\_BB_t$ ), this part mainly examines their differential impact on happiness. From the regression result in Column (3) of Table 2, formal borrowing behavior can significantly improve individual happiness by about 3%. On the contrary, the results in Column (4) indicate that the informal borrowing behavior leads to a significant decrease in happiness by 5.6%, and the absolute value of the coefficient shows that this effect is greater than the positive effect of formal borrowing, which leads to the inhibitory effect of borrowing behavior on subjective well-being to some extent. Hypothesis 2 can be verified.

### 5. Further Analysis

#### 5.1. Analysis Based on Subjective Debt and The Deviation Between Subjective Debt and Objective Debt

Borrowing behavior directly leads to the generation of debt. In general, debt repayment pressure will bring mental health shocks (Brown et al., 2005), leading to a reduction in individual happiness. For example, Crain & Ragan (2012) points out that materialists are more likely to consume beyond their financial means, which are not conducive to the improvement of household welfare. What is more, some household debts have risks beyond the household financial capacity, and they may be overly optimistic about the debt situation due to their inability to correctly perceive the current situation of household debt. In other words, when individual subjective perception of the current situation of household debt deviates from the objective facts, they may act in ways that exacerbate the risk of household debt and damage household welfare, leading to a decrease in the individual well-being.

Based on the above analysis, there are two problems need to be empirically analyzed. One is to investigate whether happiness could be driven by the subjective debt, and the other is to explore how the deviation between perceived and actual debt affects individual subjective well-being. Referring to previous studies, subjective debt is always quantified by debt repayment pressure, and in the CHFS data, there is a related question designed in the relevant mortgage loan module: "At present, how is your household economic capacity of repaying the monthly installment? ① There is no problem at all. ② There is basically no problem. ③ It is difficult to repay. ④ Absolutely impotent". Since most households with debts have a large proportion of mortgage loans, and the repayment pressure of other debts in the database cannot be effectively measured, it is adopted as a proxy variable for household subjective debt whether individuals deem that there is repayment pressure (*SD*). Options ③ and ④ are assigned a value of 1, that is, the individual has repayment pressure, and options ① and ② are assigned a value of 0, indicating that the individual has no repayment pressure. The regression results with household subjective debt as the explanatory variable are shown in Column (1) of Table 3, showing that the group with high repayment pressure is inclined to lower happiness, and compared with the group with less repayment pressure, their happiness significantly reduces by approximately 11.9%.

Researchers often use the debt-to-income ratio to measure the real debt. Taking into account the availability of the CHFS data, this paper mainly calculates the ratio of monthly mortgage repayments to monthly household income. According to the personal loan regulations for national commercial housing in China, it is appropriate to measure whether household have debt burden at an objective level based on whether the ratio exceeds 50% (the loan conditions will not be met if the proportion exceeds 50%). If the debt-to-income exceeds 50%, while the individual does not think he has debt burden, it is defined as a deviation (*Dev*) between the individual subjective perception of the household debt status and the objective fact, assigning the value 1, otherwise 0. Column (2) of Table 3 explores the effects of the deviation on happiness, indicating that once there was a deviation between the subjective and objective debts, the individual happiness would significantly reduce by 5.9%. It is thus conspicuous that individuals who are overly optimistic in the face of debt may engage in risky behavior beyond the household financial situation, which can negatively impact the individual subjective well-being.

## 5.2. The Moderating Effect of Digital Finance

At present, the rapid development of digital finance has made up for the shortcomings of traditional finance, mitigates the information asymmetry in the market, and accurately captures customers' information based on big data accurately. Conspicuously, the investigation of the borrower's loan qualifications increases the rationality of borrowing and ensures the security of the debtor's funds. Besides, the intelligent credit approval saves the borrower's time and cost, and improve the probability of their loan success while ensuring that the debtor has the potency to repay, alleviating the uncertain impact of borrowing behavior in



the traditional financial environment, lessening the decline in happiness caused by borrowing behavior to some extent.

Based on the influence of household borrowing behavior on subjective well-being, this part mainly delves the moderating role of digital finance in it. Taking into account the hysteresis of the impact, this paper uses the province-level digital financial inclusion index in 2016 published by the Digital Finance Research Center of Peking University (Guo et al., 2020), the digital financial inclusion index was divided by 100 to measure the degree of development of digital finance (*IF*), and the interaction term (*BB\*IF*) between digital finance and household borrowing is also included in the regression. Columns (3) and (4) of Table 3 shows that the development of regional digital finance can alleviate the negative impact of borrowing behavior on individual happiness, and each increase of 100 in the digital financial inclusion index in the local area alleviates the inhibitory effect of borrowing behavior on happiness by about 5%.

Table 3. The results based on further analysis

	(1)	(2)	(3)	(4)	(5)	(6)
<i>SD</i>	-0.119*** (-5.54)					
<i>DEV</i>		-0.059* (-1.87)				
<i>BB</i>			-0.145** (-2.26)	—	-0.035*** (-3.38)	—
<i>IF</i>			-0.181*** (-3.02)	-0.193*** (-3.26)	—	—
<i>BB*IF</i>			0.050* (1.86)		—	—
<i>BB<sub>1</sub></i>			—	-0.304*** (-3.46)	—	-0.043*** (-3.83)
<i>BB<sub>1</sub>*IF</i>			—	0.119*** (3.17)	—	—
<i>FK</i>			—	—	-0.009 (-0.72)	-0.011 (-1.06)
<i>BB*FK</i>			—	—	0.015 (0.81)	—
<i>BB<sub>1</sub>*FK</i>			—	—	—	0.036* (1.73)
Controls	Yes	Yes	Yes	Yes	Yes	Yes
N	2846	912	19177	19177	12351	12351
R <sup>2</sup>	0.066	0.064	0.072	0.072	0.075	0.075

Note: The values in parentheses are Z-statistics. \*p < 0.1, \*\*p < 0.05, \*\*\*p < 0.01.

### 5.3. The Moderating Effect of Financial Literacy

Studies on household behavior decision-making always emphasize the importance of financial literacy (Yin et al., 2014). As far as borrowing behavior is concerned, the liabilities are risky, especially for groups devoid of financial literacy, who have got a smattering of experience with finance, unable to deal with uncertainty, and are more likely to be over-indebted (Lusardi & Tufano, 2015). Conversely, groups with higher financial literacy generally have better capital management capabilities and risk awareness, who can optimize their financial situation as much as possible, ensure the household debts are within control, and

responding to uncertain situations timely. Thereby, they may reduce the detrimental effects caused by the borrowing behavior.

Therefore, this paper further explores the moderating effect of financial knowledge level in the effect of borrowing on subjective well-being. There are five questions to measure individual financial knowledge in the 2017 CHFS: H3105: Suppose the annual interest rate in the bank is 4%, if you put 100 yuan into a one-year deposit, what is the principal and interest you will get after one year? ① less than 104 yuan, ② equal to 104 yuan, ③ more than 104 yuan, ④ can't figure it out; H3106: Suppose the bank's annual interest rate is 5% and inflation is 3% a year, what can I buy in a year if I put 100 yuan in the bank? ① more than a year ago, ② as much as a year ago, ③ less than a year ago, ④ can't figure it out; H3111: Which do you think is riskier in general, stocks or funds? ① stocks, ② funds, ③ never heard of stocks, ④ never heard of funds, ⑤ neither has ever been heard of, ⑥ the same size. Based on these questions, two or three correct answers are assigned a value of 1 (financial knowledge level is high) and the others are assigned a value of 0 (financial knowledge level is low), so the variable *FK* is generated. Columns (5) and (6) of Table 3 shows that the interaction coefficient is positive but not significant. Further taking  $BB_t$  as an explanatory variable, and adding its interaction term with financial knowledge level, the result shows that the coefficient of interaction term is significantly positive, indicating that individuals with full-fledged knowledge of finance can significantly mitigate the inhibitory effect by approximately 3.6%.

#### 5.4. Robustness Test

To further test the robustness of the baseline results, this paper also conducts foregoing analysis by using different model and replacing explanatory variables to verify the impact of borrowing behavior on individual subjective well-being.

First, the empirical method was altered. Least Squares Regression (OLS) was deployed to re-examine the impact of household borrowing behavior on happiness. The regression results with  $BB$  and  $BB_t$  as the core explanatory variables are shown in Column (5) and (6) of Table 2, the coefficients are negative and significant at 1% level, suggesting that borrowing could lead to lower happiness, confirming the robustness of the baseline model estimate.

Second, the propensity matching score method (PSM) was used to do this test. Another important factor that may interfere with the reliability of the baseline results is the self-selection problem. That is, when the research plunges into the impact of household borrowing behavior on happiness, the occurrence of borrowing behavior and individual happiness may be affected by some variables not included in the empirical model at the same time, resulting in the self-selection problem of the sample households with borrowing behavior. Referring to the practice of Chen (2017), the PSM is used to match the borrowing behavior with the households that do not have borrowing behavior according to multiple characteristics, and through the counterfactual test, the net effect of household borrowing behavior on individual subjective well-being is stripped out. As Column (7) in Table 2 shows, the adjusted ATT is -0.032 after the regression based on sample weight substitution, and it passes the test at the 1% significance level, indicating that the negative effect of borrowing behavior on happiness is robust.

Third, the explanatory variables were replaced. Borrowing directly leads to household debt, so, this part examines the impact on happiness based on the actual amount of household debt. The variable *Debt* is reported in the CHFS database, representing the actual amount of household debt, which is added by 1 and logarithmic. According to the previous discussion, only some debts can distinguish the source, therefore, the debts that can distinguish the source are added up, the value is added by 1 and the logarithm is processed to generate the variable *Debt<sub>t</sub>*. Furthermore, this part also examines the effect of the proportion of debts based on formal borrowing to total debts (*F\_Debt<sub>t</sub>*) and the proportion of informal borrowing-based debt to total household debt (*IF\_Debt<sub>t</sub>*) on happiness. As shown in Column (1) of Table 4, each unit increase in the logarithm of debt reduces individual happiness by about 0.3%. As columns (3) and (4) shows, the coefficient of the proportion of formal debt to household debt is significantly positive, meaning that higher formal debt ratio is associated with higher happiness in individuals. In contrast, the increase in the proportion of informal debt reduces subjective well-being at the 5% significant level, so the aforementioned conclusions are robust.

Table 4. Robustness checks for replacing the explained variable

	(1)	(2)	(3)	(4)
<i>Debt</i>	-0.003*** (-4.65)	—	—	—
<i>Debt<sub>t</sub></i>	—	-0.002*** (-3.10)	—	—
<i>F_Debt<sub>t</sub></i>	—	—	0.035** (2.03)	—
<i>IF_Debt<sub>t</sub></i>	—	—	—	-0.047** (-2.40)
Controls	Yes	Yes	Yes	Yes
N	19,177	19,177	3,879	3,879
R <sup>2</sup>	0.072	0.072	0.066	0.067

Note: The values in parentheses are Z-statistics. \*p < 0.1, \*\*p < 0.05, \*\*\*p < 0.01.

## 6. Conclusion and Discussion

Promoting people's living standard is an important part of achieving common prosperity, and the enhancement of individual happiness is of great significance for improving people's livelihood and well-being. As one of the main economic behaviors, borrowing has a decisive impact on behavior decision-making, capital flow, economic status and subjective feelings.

This paper empirically investigates the impact of household borrowing behavior on individual subjective well-being through the CHFS data in 2017, the results show that borrowing behavior inhibits the improvement of individual happiness, and the negative impact mainly originates from informal borrowing, while formal borrowing can significantly enhance the subjective well-being. In addition, this paper also plunges into how the subjective debt burden and the cognitive bias affect happiness, the result shows that those who perceive their greater debt repayment pressure have a significant inhibiting effect on happiness, and the cognitive deviation of subjective and objective debts also decreases the well-being. This result may explain that borrowing restrains happiness mainly due to the psychology stress of debt, particularly in China's relation society, informal borrowing probably contributing to greater debt repayment pressure. The other

explanation is someone cannot correctly recognize their debt status, and they keep optimistic about the debt exceeding household solvency. Besides, to offer insights into some of the moderating effects possibly driving the negative effect between borrowing and happiness, this paper further probes into the digital finance and individual financial literacy, the result shows that the rapid development of regional digital finance and the improvement of individual financial literacy can significantly alleviate the inhibitory effect of household borrowing behavior on happiness.

The empirical results contain several strong policy implications. The first is to regulate the credit market. It is important to accelerate the development of the formal credit market, especially with the rapid development of digital finance, and improve the availability of credit for individuals who have the demands and then meet loan qualifications relying on digitization, artificial intelligence, etc. Besides, the normative development of informal credit should be actively guided to promote the diversification of the credit market. For instance, it is necessary to establish and improve relevant laws and regulations on private credit, encourage the healthy development of private financing, gradually incorporate private financial institutions into the regulatory system in due course, protect the legitimate rights and interests of consumers. The second is to strengthen the popularization of financial knowledge, improve the individual financial literacy. This helps to deepen individual understanding of the financial market, and guide individuals to make correct financial decisions, therefore, avoiding the debt pressure and cognitive deviation caused by greater debt burden.

Conflict of interest: none

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