Final Project Report

1. Introduction of data

The China Household Finance Survey (CHFS) is a sampling survey project conducted by the China Household Finance Survey and Research Center nationwide, aiming to comprehensively characterize the economic and financial behavior of households by collecting information on assets, liabilities, income, consumption and insurance. The data in this project is selected based on the latest public survey results of CHFS in 2019. Exclude sample data with obvious errors, such as zero household housing area, zero annual household income, and zero annual expenditure. Finally, this project selected 2831 samples for analysis. STATA15.0 is used for statistical analysis.

2. Description of the research question

This report's aim is to explore the impact of liquidity constraints measured by debt and the proportion of housing assets in total assets on family consumption and income. Furthermore, this report also try to find out the interactive effects of family commercial insurance on the impact of liquidity constraints.

3. Summary of approach and results

(1) Descriptive statistics

From a financial perspective, the average annual income of these 2831 families is 94079 yuan, with a range of over 4.5 million yuan, indicating a significant income gap between different families; The average total household debt is 11471 yuan, with a range of over 2 million yuan.

From the perspective of household housing assets, the average housing assets of 2831 households reached 2231000 yuan. Based on the average annual income and average housing area mentioned earlier, households need more than 26 years of income to purchase residential properties.

From the perspective of household consumption, the average annual consumption expenditure of the sample households is 24451 yuan, accounting for 25.98% of the average income, which is significantly lower than the world level.

(2) OLS multiple regression

a. Liquidity constraints, housing assets, and household consumption

In order to study the impact of liquidity constraints and housing assets on household consumption, the model in this section is set as follows:

$$Consume = \beta_0 + \beta_1 Debt_i + \beta_2 House_i + e_i$$

From the OLS multiple regression analysis results, it can be seen that when the response is set as household consumption, the coefficient of total household debt is -0.043, and the effect is significant at the 95% level. This result means that the more total debt a household has, the deeper its liquidity constraint, and the less its annual consumption expenditure it has. For every 10000 yuan increase in debt, household consumption expenditure decreases by 430 yuan.

The coefficient of household housing assets is extremely negative and significant at the 99% level,

which means that the more housing assets a household has, the less consumption expenditure it has.

b. Liquidity constraints, housing assets, and household income

In order to study the impact of liquidity constraints and housing assets on household income, the model in this section is set as follows:

$$Income=\beta_0+\beta_1 Debt_i+\beta_2 FDebt_i+\beta_3 House_i+e_i$$

From the OLS multiple regression analysis results, it can be seen that when the dependent variable is set as household income, the coefficient of total household debt is -0.085, which is significant at the 95% level. This result shows that the more household debt, the higher household income. For every 10000 yuan increase in total household debt, household income increases by 850 yuan. The coefficient of household financial liabilities is positive, but the significance is weak, indicating that there is no significant relationship between financial assets and liabilities and household income.

The coefficient of household housing assets is positive and significant at the 99% level, which means that the higher the household's housing assets, the higher the household income.

c. OLS multiple regression analysis with interaction terms

In order to investigate whether the impact of liquidity constraints on household consumption varies with the purchase of commercial insurance and different amounts of commercial insurance, this paper constructs the following OLS regression model with interaction terms:

$$Consume=\beta_0+\beta_1 Debt_i+\beta_2 VIns_i+\beta_3 Insurance_i+\beta_4 Debt*Insurance+\beta_5 House_i+e_i$$

From the regression results, the coefficient of the dummy variable VIns, representing whether households purchase commercial insurance, is positive and significant at the 95% level. This result indicates that overall, households who purchase commercial insurance have higher consumption expenditures than those who do not, indicating that purchasing commercial insurance has a promoting effect on household consumption.

The coefficient of the total amount of commercial insurance for households is positive and significant at the 99% level. This result indicates that the higher the total amount of commercial insurance purchased by households, the higher their annual consumption expenditure.

The coefficient of the interaction term between the total amount of household commercial insurance and household debt is also positive and significant at the 95% level, indicating that the interaction term has a weakening effect on the main effect. That is to say, the more the total amount of household commercial insurance, the weaker the negative impact of liquidity constraints represented by the total amount of household debt on household consumption expenditure.

(3) Robust Test

After completing the empirical analysis of the sample data, in order to ensure the reliability of the

analysis results, this part uses the survey results of the fourth round of China Household Finance Survey (CHFS) in 2017 for robustness analysis.

The results showed that after using 2017 data for OLS multiple regression analysis, the coefficients of total household debt and household housing assets remained negative and significant at the 99% level. The significance of the household housing asset coefficient has increased, which may be related to the more obvious growth trend of housing prices in 2017. The coefficient of household debt and housing assets remains positive. Household debt is significant at the 90% level, although the significance has decreased, it still has statistical significance.

The results of the robustness analysis are consistent with the previous analysis, proving that the analysis results in this project are robust.

(4) Multicollinearity detection

To test for multicollinearity in the model, this part conducts multicollinearity tests on the two core OLS multiple regression models.

The results showed that all the VIFs of two models are all less than 10, which means there is no multicollinearity in these two models.

4. Conclusion

Through OLS multiple regression analysis, it was found that the more household debt or housing assets a household has, the higher their annual income and the lower their annual consumption expenditure. Specifically, for every 10000 yuan increase in total household debt, the annual consumption expenditure of the household decreases by 430 yuan, and the annual income of the household increases by 850 yuan. For every 10000 yuan increase in total household housing assets, the annual consumption expenditure of the household decreases by 10 yuan, and the annual income of the household increases by 10 yuan. And by using survey data from 2017 for robustness and multicollinearity tests, it is proven that the above model in this article does not have multicollinearity, and the analysis results are robust.

The OLS multiple regression results with interaction terms indicate that purchasing commercial insurance by households will promote household consumption, and the more total commercial insurance purchased, the more annual household consumption expenditure will be. Specifically, for every 10000 yuan of additional commercial insurance purchased by households, they will increase their annual consumption expenditure by 110 yuan; The interaction coefficient between the total amount of household commercial insurance and the total amount of household debt is positive, while the coefficient of the total amount of household debt is negative. This indicates that household commercial insurance will weaken the negative impact of liquidity constraints on household consumption. The more total amount of household commercial insurance, the weaker the negative impact of liquidity constraints on household consumption.

Appendix

Table 1 Descriptive statistics

	(1)	(2)	(3)	(4)	(5)
VARIABLES	N	mean	sd	min	max
Income	2,831	94,079	164,657	1	4.500e+06
Debt	2,831	11,471	73,746	0	2.000e+06
House	2,831	2.231e+06	1.265e+07	30	3.613e+08
Price	2,831	35,242	188,124	1	5.000e+06
Bldg	2,831	1.078	0.344	1	9
Consume	2,831	24,451	43,500	15	832,200
Food	2,801	2,195	2,401	0	60,000
Insurance	2,782	53,157	332,498	0	6.100e+06

Table 2 Correlation analysis of major variables

	Income	Debt	Fdebt	House	Consume	Insurance
Income	1					
Debt	0.042**	1				
Fdebt	0.00800	0.074***	1			
House	0.064***	0.059***	0.00200	1		
Consume	0.327***	-0.051***	0.046**	-0.037**	1	
Insurance	0.154***	0.035*	0.044**	-0.00300	0.125***	1

Table 3 Liquidity constraints, housing assets, and household consumption

	(1)
VARIABLES	y
Debt	-0.043**
	(-2.34)
House	-0.001***

	(-4.16)
Constant	20,587.306***
	(16.71)
Observations	1,063
R-squared	0.021

t-statistics in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Table 4 Liquidity constraints, housing assets, and household income

VARIABLES	(1)
	y
Debt	0.085**
	(2.02)
Fdebt	0.274
	(0.26)
House	0.001***
	(3.29)
Constant	91,277.129***
	(28.81)
Observations	2,831
R-squared	0.006

t-statistics in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Table 6 OLS multiple regression analysis with interaction terms

VARIABLES	(1)
	y

Debt	-0.016
	(-0.81)
VIns	9,045.960**
	(1.99)
Insurance	0.011***
	(2.68)
Di	0.000**
	(2.38)
House	-0.001***
	(-4.20)
Constant	19,290.110***
	(15.18)
Observations	1,063
R-squared	0.051

t-statistics in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Table 7 Robust Test for consumption

	(1)
VARIABLES	y
Debt（总负债）	-0.221***
	(-8.40)
House（住房资产）	-0.001***
	(-6.91)
Constant	17,623.668***
	(17.00)

Observations	1,096
R-squared	0.101

t-statistics in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Table 8 Robust Test for income

	(1)
VARIABLES	y
Debt（总负债）	0.006*
	(1.42)
House（住房资产）	0.000***
	(7.95)
Constant	4,913.105***
	(28.10)
Observations	1,096
R-squared	0.057

Table 9 VIFs for consumption

VARIABLES	VIF	1/VIF
Debt	1.00	0.996479
House	1.00	0.996479
Mean	1.00	

Table 10 VIFs for income

VARIABLES	VIF	1/VIF
Debt	1.01	0.990993
Fdebt	1.01	0.994489
House	1.00	0.996475
Mean	1.01	