

Analysis of the Effectiveness of Real Estate Market to Household Consumption under Macro-control Policy

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Abstract: Housing has become an important part of household wealth in China. On the one hand, it can promote household consumption through the wealth effect, on the other hand, it may reduce household consumption due to the "house slave effect". Throughout the research process of housing assets, most scholars study the horizontal level, through the data tracking of different families, to explore the impact of housing assets on household consumption. Based on the data from China Household Finance Survey from 2011 to 2019, this paper constructs a balanced panel, and uses OLS and fixed effect model to analyze the impact of housing asset appreciation on household consumption. The results show that the appreciation of housing assets can promote household consumption. In the heterogeneity analysis, for the families with only one suite, the housing is mostly to meet the living demand, and the role of housing assets in promoting consumption is small. In addition, for families in the central and western regions, under the influence of housing asset appreciation, the level of household consumption is higher. Mechanism analysis shows that the appreciation of housing assets alleviates household credit and makes households smooth consumption by borrowing. The policy implications of this paper are: to strengthen the implementation of "purchase restriction", improve the proportion of public participation in macro-control, and further improve the real estate industry supervision system.

Keywords: Housing Asset Appreciation, Household Consumption, Macro Policy, Fixed Effect

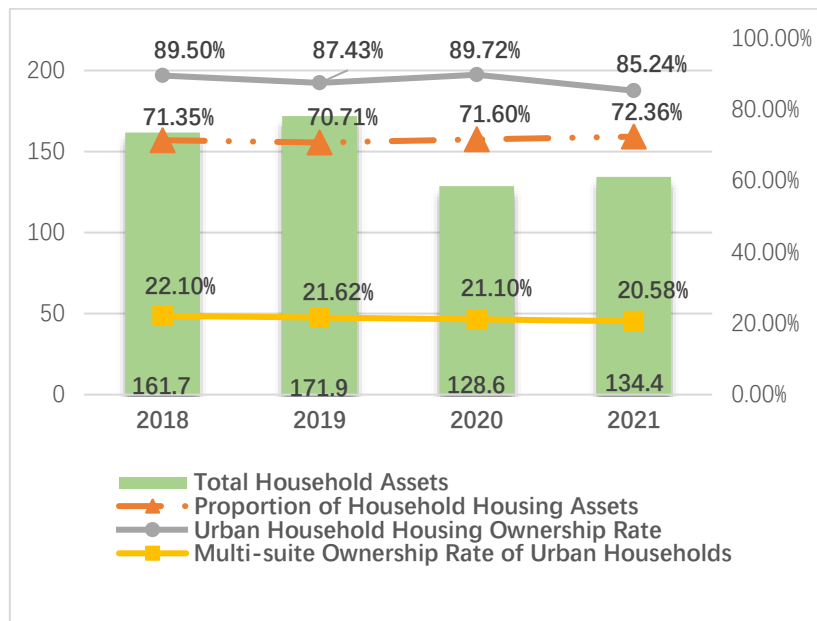
1. Introduction

Under the background of accelerating the construction of a new development framework with domestic circulation as the main body and domestic and international double circulation mutually promoting each other, real estate has become a pillar industry of the national economy and one of the main driving forces for continued economic development. According to the National Bureau of Statistics, in 2021, the total wealth of China residents reached 687 trillion yuan, with average household assets of about 1.344 million yuan, of which housing assets accounted for 70 percent. The CPC Central Committee attaches great importance to the housing problem of the people, continuously deepens the reform of the housing system, strengthens the regulation and control of the housing market, and has formed a series of new ideas, new ideas and new viewpoints, which have clarified the direction and provided follow-up for China to improve the housing system and promote the healthy and orderly development of the housing market.

Cultivating a consumption-oriented "internal circulation" market can help China cope more calmly with the changeable international economic environment. In 2021, the final consumption expenditure of residents accounted for 54.5% of GDP, 11.5% higher than the total capital formation, the highest proportion in recent years. On the whole, the per capita consumption expenditure of residents in China continues to grow, reaching CNY 5641.1 in 2020. The Sixth Plenary Session of the 19th CPC Central Committee proposed to firmly establish the concept of "taking consumers as the core" and deeply cultivate people's feelings. In recent years, China's consumer market has continued to recover, and the consumption structure of residents has been continuously optimized and upgraded.

With the housing reform and the development of the real estate market, housing has gradually become an important asset and wealth for Chinese families in accordance with Figure 1. Since the 18th National Congress of the Communist Organization of China, the state has constantly improved the real estate market, put forward a series of macro-control policies, promoted the rapid development of the real estate industry, and the real estate system has been constantly improved. The 2016 Central Economic Work Conference pointed out that "houses are used for living, not for speculation" to curb the excessive rise in housing prices in some cities. The year 2021 is a key turning point for the real estate industry. The "14th Five-Year Plan" has been fully launched, and the central government continues the policy of "housing

and housing will not be fired" and the effect of "three red lines" becomes more and more obvious.



Source: China Household Finance Survey.

Figure 1: Household Assets and Housing in China from 2018 to 2021

Yin Zhichao ^[1] (2021) found that housing wealth significantly promoted urban household consumption, significantly improved household consumption structure, and housing assets had a wealth effect. The relevant mechanism test is that housing wealth can ease liquidity constraints, thus improving the level of household consumption. According to the life cycle-permanent income hypothesis, real estate has an important impact on residents' consumption, and the fluctuation of house prices will change people's wealth stock, thus bringing uncertainty to household wealth. From the perspective of the influence of housing wealth on consumption, scholars have given different conclusions. Some scholars believe that the increase in housing wealth can promote household consumption and produce a wealth effect (Yin Zhichao and Gan Li ^[2], 2010; Zhang Dayong and Cao Hong ^[3], 2012); Other scholars hold different opinions and believe that the increase of housing wealth will reduce household consumption, thus producing the house slave effect (Color and Zhu Guozhong ^[4], 2013; Zhao Xiliang et al. ^[5], 2013), due to the existence of credit constraints, household consumption expenditure is affected (Huang Qian et al. ^[6], 2021). Expand the research of Yin Zhichao et al. (2021) to further discuss the impact of house price appreciation on household consumption in China from the perspective of house price appreciation.

Compared with the previous literature, the possible innovations and contributions of this paper are as follows: On the one hand, we use the OLS model and fixed effect model to estimate the influence coefficient of housing asset appreciation on household consumption, and contrast it with the effect of housing wealth. On the other hand, it is more reasonable to explore the change in housing asset value over many years and supplement the previous literature on the change in housing wealth at the horizontal level. The rest of this paper is arranged as follows: The second part is the research design, introducing the definition of data and variables, and proposing the hypothesis model; In the third part, the author empirically studies the impact of the appreciation of housing assets on household consumption and outputs the regression results. The fourth part further studies the heterogeneous impact of housing asset appreciation on the consumption of multi-suite families and families in different regions and its mechanism; In the fifth part, credit constraint is taken as a mechanism variable to test the credit effect of households. The sixth part summarizes and discusses the relevant policies and makes recommendations.

2. Study Design

2.1 Data Description

The data used in this paper comes from the China Household Finance Survey (CHFS) conducted nationwide in 2015, 2017 and 2019 by the China Household Finance Research and Research Center of the Southwestern University of Finance and Economics. The China Household Finance Survey adopts a

three-stage, stratified, and proportional population size (PPS) sampling method. Through scientific sampling, modern survey techniques and survey management tools such as the Computer Aided Survey System (CAPI) are used to collect micro-information on Chinese household finance. This paper focuses on the impact of household housing asset appreciation on household consumption. The following are household housing assets, household housing asset appreciation, household consumption, household credit constraints, and other control variables.

2.2 Variable Definition

(1) Explained Variable

To study the impact of changes in housing assets on household consumption, the explained variable selected in this paper is household consumption. This paper defines household consumption as household consumption expenditure. According to the data of the National Bureau of Statistics, household consumption expenditure refers to all expenditures used by residents to meet the daily consumption needs of households, including both cash consumption expenditure and physical consumption expenditure. Consumption expenditure includes eight categories: food, tobacco and alcohol, clothing, housing, daily necessities and services, transportation and communication, education, culture and entertainment, medical care, and other goods and services.

(2) Explanatory Variables

In this paper, housing assets are defined as family housing assets, and the appreciation of housing assets is defined by subtracting the housing assets of the previous year from the housing assets of the next year. This measure allows for a sample of households that are tracked over many years to more realistically reflect changes in household housing wealth as the economy develops.

(3) Mechanism Variables

According to Guiso et al., 1996^[7], in analyzing the credit effect of the increase in housing wealth on household consumption, the standard introduces a dummy variable of household use of credit cards. A household using a credit card is defined as 1, and the household is considered not to be subject to credit constraints; A household that does not use a credit card is defined as 0 and is considered credit bound.

(4) Control Variables

This paper controls household head characteristic variables and family characteristic variables. Among them, the household head characteristic variables include gender, age, health status, marital status, unemployment, minor children, risk preference, and other variables; The family characteristic variables include family total income, family financial assets, family size, province, rural and other variables.

2.3 Model Design

When analyzing the impact of housing assets and housing asset appreciation on household consumption, this paper constructs the following regression model:

$$\text{Consumption}_{it} = \alpha + \beta \ln_rise_{it} + X_{it}\gamma + C_i + \mu_{it} \quad (1)$$

$$\text{Consumption}_{it} = \alpha + \beta \ln_house_asset_{it} + X_{it}\gamma + C_i + \mu_{it} \quad (2)$$

Consumption_{it} represents the consumption of household i in period t , $\ln_house_asset_{it}$ represents the household housing asset of household i in period t , \ln_rise_{it} is the appreciation of household housing assets, X_{it} is the control variable, C_i is the omission variable that does not change with time, and μ_{it} is the residual term.

In addition, this paper examines whether the appreciation of housing wealth alleviates household credit constraints, and constructs the following regression models:

$$\text{Consumption}_{it} = \alpha + \beta \ln_house_asset_{it} + \text{Credit_constraint}_{it} + X_{it}\gamma + C_i + \mu_{it} \quad (3)$$

$$\text{Consumption}_{it} = \alpha + \beta \ln_rise_{it} + \text{Credit_constraint}_{it} + X_{it}\gamma + C_i + \mu_{it} \quad (4)$$

$\text{Credit_constraint}_{it}$ is a dummy variable representing credit constraints, Consumption_{it} represents the consumption of household i in period t , $\ln_house_asset_{it}$ represents the logarithm of household housing assets in period t , \ln_rise_{it} is household housing assets appreciation, X_{it} is a control variable, C_i is a missing variable that does not change with time, and μ_{it} is a residual term. The

coefficient β_1 measures the credit effect of household housing wealth appreciation.

3. Empirical results

3.1 Descriptive Statistics

Table 1 reports the descriptive statistics for the variables. Among them, the unit of household housing assets, total household consumption, total household income, and household financial assets is 10,000 yuan, which needs to be logarithmic in the regression. In recent years, the state has implemented rural revitalization, deepened rural reform, and promulgated a new policy of "integration of housing and land". Rural households need to register real estate, and the right to use homestead cannot be transferred separately and cannot be used for a mortgage. Because most of the rural houses in China are collective property rights, they are not commercial houses and cannot be mortgaged as formal collateral, and there is a big difference between the sale and net value calculation and general commercial houses, so this paper excludes the rural samples. The samples with missing values were removed, and the remaining valid samples of the balanced panel were 81578.

Table 1: Descriptive Statistics

	count	mean	sd	min	max
house_asset	81578	972,983.716	1467690.981	0	49720000
consume	81578	71,809.546	71,469.818	0	1.695e+08
rise	30796	592,011.604	1002744.788	0	45720000
growth_consump	30476	23.634	1,895.664	0	218,580.422
fina_asset	81578	118,760.806	246,011.860	0	78282336
income	81578	91,649.326	106,076.976	-15,166.578	690,180
family_size	81578	2.029	1.417	1	15
male	81578	0.699	0.458	0	1
age	81578	54.533	15.006	18	117
health	81578	0.482	0.500	0	1
married	81578	0.838	0.368	0	1
unwork	81578	0.379	0.485	0	1
children_yes	81578	0.369	0.482	0	1
risk	81578	0.083	0.276	0	1
house_debt	81578	42,441.878	216,915.104	0	20000000

3.2 Regression Results

Table 2 reports the aggregate effect of household housing assets and housing asset appreciation on household consumption, with household consumption as the explained variable. Results were obtained using an OLS model and a panel data fixed effects model, controlling for both individual and year-fixed effects. From column (1), the estimated coefficient of housing assets to household consumption estimated by OLS is 0.021, which is significant at the 1% significance level. From column (2), we can see that the estimated coefficient of housing assets to household consumption obtained by FE estimation is 0.011, which is significant at a 1% significance level. As can be seen from column (3), the estimated coefficient of housing asset appreciation to household consumption estimated by OLS is 0.005, which is significant at the 1% significance level. This suggests that the likelihood of household consumption increases significantly by 0.5 percent when the value of household housing assets increases. Column (4) uses panel fixed effects estimates to find that the estimated coefficient of housing asset appreciation on household consumption is 0.002, which is significant at the 1% significance level. This suggests that an increase in housing assets can significantly boost aggregate household consumption.

To conclude, the impact of total household income and financial assets on household consumption is significantly positive at the level of 1%. Households with higher income levels tend to have higher housing wealth. Family size has a positive effect on consumption, and consumption increases when the family size is larger. The head of the household is the main source of household income and the main decision-maker of the household. His risk attitude, physical condition, and working condition will have an important impact on household consumption.

Table 2 Impact of housing assets and housing asset appreciation on household consumption

VARIABLES	ln_consump			
	ols	fe	ols	fe
ln_house	0.021*** (0.001)	0.011*** (0.002)		
ln_rise			0.005*** (0.000)	0.002*** (0.000)
male	-0.051*** (0.009)	0.025* (0.015)	-0.039*** (0.009)	0.032* (0.017)
age	-0.016*** (0.000)	-0.009*** (0.001)	-0.011*** (0.000)	-0.005*** (0.001)
health	0.065*** (0.007)	-0.029** (0.013)	0.031*** (0.008)	-0.044*** (0.013)
married	0.278*** (0.012)	0.110*** (0.031)	0.212*** (0.013)	0.068** (0.030)
unwork	0.205*** (0.010)	0.118*** (0.019)	0.155*** (0.010)	0.019 (0.018)
ln_income	0.039*** (0.002)	0.019*** (0.002)	0.041*** (0.003)	0.017*** (0.003)
ln_fina	0.050*** (0.001)	0.012*** (0.002)	0.066*** (0.001)	0.015*** (0.002)
family_size	0.062*** (0.003)	0.018*** (0.005)	0.100*** (0.004)	0.075*** (0.008)
children_yes	0.181*** (0.009)	0.281*** (0.020)	0.102*** (0.011)	0.164*** (0.026)
risk	0.255*** (0.013)	0.115*** (0.022)	0.218*** (0.024)	0.116*** (0.033)
year	yes	yes	yes	yes
prov	no	yes	np	yes
Constant	7.510*** (0.074)	7.718*** (0.102)	10.312*** (0.040)	10.385*** (0.080)
Observations	81,578	81,578	30,795	30,795
R-squared	0.510	0.522	0.328	0.141
Number of hhid		50,416		21,144

Robust standard errors in parentheses

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

4. Further Analysis

4.1 Heterogeneity Analysis

As shown in Table 3, the total sample of households is divided into three groups according to the number of housing units: For the family group with 1 suite, the family group with 2 suites, and the family group with 3 suites or more, the interaction item between housing assets and the number of family houses, the interaction item between housing asset appreciation and the number of family houses are constructed to test the impact of housing assets and housing asset appreciation on the relevant consumption of households with different housing quantities. Other explanatory variables are controlled unchanged. The estimated results are shown in Table 3. In Table 3, columns (1) and (2) show the OLS regression results. From column (1), it can be seen that the coefficient of the cross-estimation term is negative in the sample of households with one suite, while the coefficient of the cross-estimation term is positive in the sample of households with two suites and three suites, and more. The coefficient of households with three suites and more is 0.027, which is higher than the coefficient of households with two suites 0.018. This shows that the wealth effect of housing assets will increase with the increase in the number of households owned. As can be seen from column (2), the coefficient of the cross-estimator is still negative in the sample of 1-suite households, while the coefficient of the cross-estimator is positive in the sample of 2-suite households and 3-suite households and more, and the coefficient of the group of 3-suite households and more is 0.033, which is higher than the coefficient of 0.014 in the group of 2-suite households and is significant at the 1% significance level. This shows that the appreciation of housing assets will promote

household consumption more with the increase in household housing ownership. The possible reason is that housing has dual attributes. For families, it is both consumer goods and sometimes investment goods. For families with 1 suite, this kind of housing plays the residential attribute and meets the daily life needs of families. The change in housing assets will not significantly affect the consumption of families; however, for the group of two or more than three sets of households, with the increase in the number of households, the possibility of households using their housing assets to invest to increase household consumption increases, which is consistent with the regression results of fixed effect model, indicating that the conclusion of this study is robust.

Table 3: Impact of housing assets and housing asset appreciation on the number of household housing consumed by households

VARIABLES	ln_consump	
	ols	ols
house_hh_number_1	-0.017*** (0.001)	
house_hh_number_2	0.018*** (0.001)	
house_hh_number_3	0.027*** (0.001)	
rise_hh_number_1		-0.005*** (0.001)
rise_hh_number_2		0.014*** (0.002)
rise_hh_number_3		0.033*** (0.002)
Control	Yes	Yes
year	Yes	Yes
prov	Yes	Yes
Constant	7.600*** (0.074)	10.322*** (0.040)
Observations	81,578	30,795
R-squared	0.516	0.331

Robust standard errors in parentheses

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

4.2 The Impact of Housing Asset Appreciation on Household Consumption in Different Regions

In this paper, households are divided into eastern, western, and central family groups according to the region. OLS model and fixed effect model are used to test the impact of housing assets and housing asset appreciation on household consumption in eastern, central, and western regions. The estimated results are shown in Table 4. The results show that the wealth effect of housing assets and the estimated coefficient of housing assets value added is significantly positive. Comparing the results of different regional household groups, we can find that with the change of region, the wealth effect of housing assets increases from the east, the middle, and the west in turn. From column (1), we can see that the estimated coefficient of wealth effect of housing in the eastern region is 0.019, which is significant at the 1% significance level. From column (3), we can see that the estimated coefficient of the appreciation of housing assets to household consumption in the central region is 0.021, which is significant at the 1% significance level. From column (5), the estimated coefficient of the interaction between housing asset appreciation and the eastern region to household consumption is 0.026, which is significant at the 1% significance level. In the fixed-effect model, the estimated coefficient of the impact of the increase in housing assets on household consumption is 0.005. This shows that we can see that housing assets for the central and western regions of household consumption promote a greater role. The economic level in the central and western regions is relatively low, and the economic pressure faced by individuals and families is great. Therefore, with the increase in family wealth, families are more likely to extract housing wealth from different channels for consumption and improve the living standard of families. In the eastern region, the pressure of house purchase and the cost of living is relatively high, and it is less likely that consumers will be greatly increased after the increase in housing wealth.

Table 4: Impact of housing assets and housing asset appreciation on household consumption in eastern, central, and western regions

VARIABLES	ln_consump		ln_consump		ln_consump	
	EAST		MIDDLE		WEST	
ln_house	0.019***		0.021***		0.026***	
	(0.001)		(0.002)		(0.002)	
ln_rise		0.005***		0.005***		0.005***
		(0.000)		(0.001)		(0.001)
Control	Yes	Yes	Yes	Yes	Yes	Yes
year	Yes	Yes	Yes	Yes	Yes	Yes
EASTprov		Yes				
MIDDLEprov				Yes		
WESTprov						Yes
Constant	7.598***	10.314***	7.053***	9.746***	7.201***	10.168***
	(0.095)	(0.059)	(0.124)	(0.070)	(0.458)	(0.075)
Observations	43,128	15,820	19,425	7,410	17,780	7,139
R-squared	0.511	0.335	0.508	0.283	0.499	0.306

Robust standard errors in parentheses

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

5. Mechanism Analysis

To further verify the above conclusions and test the credit effect of housing wealth more comprehensively, this part explores the impact of housing wealth and housing wealth appreciation on household credit constraints. The estimated results are shown in Table 5. As can be seen from column (1), using the OLS model to estimate the impact of housing wealth on household credit constraints, the estimated coefficient is -0.006, which is significant at the 1% significance level. As can be seen from column (3), using the OLS model to estimate the impact of housing wealth appreciation on household credit constraints, the estimated coefficient is -0.001, which is significant at the 1% significance level. This shows that the higher the household housing wealth, the lower the possibility of household credit constraints and liquidity constraints. Housing wealth significantly alleviates household credit constraints, reduces household liquidity constraints, and exerts credit effect.

Table 5: The impact of housing wealth and the appreciation of housing wealth on household credit constraints

VARIABLES	credit			
	ols	fe	ols	fe
ln_house	-0.006***	-0.001**		
	(0.000)	(0.000)		
ln_rise			-0.002***	-0.001***
			(0.000)	(0.000)
Control	Yes	Yes	Yes	Yes
year	Yes	Yes	Yes	Yes
prov	Yes	Yes	Yes	Yes
Constant	0.797***	0.865***	0.587***	0.747***
	(0.014)	(0.024)	(0.020)	(0.039)
Observations	80,710	80,710	30,613	30,613
R-squared	0.194	0.020	0.181	0.018
Number of hhid		50,113		21,081

Robust standard errors in parentheses

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

6. Conclusions and Recommendations

The report of the 20th National Congress of the Communist Organization of China pointed out that promoting consumption growth is a key measure to promote domestic circulation and expanding domestic demand strategy, which plays a fundamental role in economic and social development. Based on the data

from China Household Finance Survey from 2011 to 2019, this paper constructs a balanced panel to comprehensively study the effect of housing asset appreciation on urban household consumption in China. The results show that the appreciation of housing assets can promote household consumption. Heterogeneity analysis shows that for families with only one suite, housing is mostly to meet living needs, and the role of housing assets in promoting consumption is small. In addition, for families in the central and western regions, under the influence of housing wealth appreciation, the level of household consumption is higher. As household wealth increases, households are more likely to withdraw housing wealth from different sources for consumption, thereby improving household living standards. In addition, the mechanism analysis shows that housing assets ease household credit so that households borrow to smooth consumption. On the whole, under the premise of the reasonable control of house prices and risk prevention, the fluctuation of housing wealth helps to improve the consumption level of families and promote the upgrading of the consumption structure.

Based on the above conclusions, this paper puts forward some suggestions to improve the macro-control of China's real estate market from the following aspects:

(1) The government should strengthen the enforcement of the "purchase restriction order" and improve the purchase restriction policy.

The effect of the short-term purchase restriction policy is limited, depending on the specific purchase restriction policy and implementation intensity. The central government should strictly enforce the purchase qualification and financial restrictions, such as strengthening the restrictions on non-local household buyers and encouraging the expansion of purchase restriction areas. Further eliminate loopholes in policy design, combine credit and tax policies to ensure that their scale matches the development of the macroeconomy, limit the rise of housing prices from multiple angles, and better guide financial development to serve the real economy.

(2) Strengthen public participation in macro-control and reduce the institutional costs of both parties.

Before formulating and adjusting macro-control documents, experts shall be organized to discuss the specific measures involved in macro-control, and public participation in administrative decision-making procedures shall be actively carried out. At the same time, after the policy is issued, feedback opinions shall be collected regularly from grass-roots organizations and citizens, and unreasonable places shall be adjusted in time to make the decision-making fully echo the demands of citizens.

(3) Improve the supervision system by scientific and technological means.

Make full use of modern scientific and technological means such as "big data analysis", through statistics and analysis of relevant indicators such as supply and demand of the real estate market, strengthen dynamic monitoring utilizing information technology, establish an early warning system for the development trend of the real estate market, strengthen the analysis and prediction of market trends, prevent risks, and establish a regular release system. In the imbalance between supply and demand, timely disclosure to the community, so that citizens understand the actual situation of the real estate market to reduce the imbalance between supply and demand caused by information asymmetry amplification, and guide citizens to purchase houses rationally.

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