Analysis of the Impact of Property Tax on Property Wealth Effect

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Abstract. Contemporarily, with the boosting value of China's real estate prices as well as the prospers of the market, family real estate wealth also increases. Based on the data of China Household Finance Survey (CHFS) in 2019, this paper investigates and discusses the impact of household property wealth on household consumption and the impact of property tax on the property wealth effect. Empirical research shows that real estate wealth has a significant positive impact on household consumption. In other words, the increase of it has a significant promoting effect on household consumption. The property tax has a significant restraining effect on the wealth effect of real estate. According to the analysis, a number of relevant policy suggestions are put forward to help accelerate economic development, promote consumer consumption, stabilize employment, and improve people's well-being. Overall, these results shed light on guiding further exploration of the impact of property taxes on household consumption.

Keywords: Real Estate Wealth; Household Consumption; Housing Loan.

1. Introduction

China began real estate market reform in 1998, causing an increase in real estate prices with price levels in the some regions. Particularly, the price of first-tier metropolises are continuing to rise, as well as the rise in property prices far outpacing the total growth level of the economic system as well and the increase in services and goods in the other industries [1]. Prior to the Internet bubble bust in 2000, this wealth impact study had been restricted to stock holdings. However, following the Internet boom, the property investment effect drew extensive scholarly attention as stock values continued to plummet. In addition, rather of falling, citizens' household consumption expenditures climbed. The trend of excessive housing price growth has had a significant impact not only on the quality of consumption, but also on the sustained and stable development of the entire national economy. As a consequence, it causes the housing price issue to become an important economic and social issue that has caused widespread concern among the entire population [2].

According to previous scholarly research, property prices have a significant boost to household consumption. Based on CHFS data, Mao's team found that housing price increases have a boosting effect on the consumption of all three types of households: at least two homes, only one home, and no home. Among them, the greatest impact is on households without a home [3]. He and Yang's research focuses on the house price to income ratio, using data from the 2009 National Bureau of Statistics (NBS) Survey of Economic Conditions and Attitudes of Urban Residents in China, and further concludes that household consumption levels are higher in areas with high house price to income ratios [4]. Yan's team used data from the Chinese Family Panel Studiesto build a panel data model for empirical evidence, and concluded that household inheritance motives and potential demand for home replacement would suppress the increase in consumption expenditure [5]. Zhao used data from 31 provinces as a sample and applied a panel data model to analyze that property wealth has a dampening effect on residential consumption and a boosting effect on non-residential consumption [6]. Using a stochastic Ramsey model, Ju's team found a significant difference in the sensitivity of consumption levels to changes in house prices between the east and west of China, with the west being more sensitive [7]. Most Chinese households are bound to purchase property in their lifetime and it is a great expense to buy a house. In recent years, many industries have been hit hard due to the new crown pneumonia, leading to low consumption. The state has introduced various policies to boost consumption, such as cash handouts and subsidies for some products.

In this paper, it will be analyzed the impact of house price fluctuation on household consumption and the effect of property wealth effect after the property tax is imposed from the perspective of the perimeter, combined with data empirical evidence. When house prices rise, the wealth of households rises, i.e., there is a wealth effect, which will lead to an increase in household consumption. When a property tax is imposed, households holding property face a financial burden. The paper then uses regression analysis to determine whether house price fluctuations dominate or property taxes dominate in the effect on household wealth effect. Finally, based on the conclusions obtained from the empirical analysis, corresponding recommendations are given in the context of the actual situation. The subsequent chapters of this paper are structured as follows. The Sec. 2 will present analysis of the trend of house price change and mechanism in. Then, the Sec. 3 will give an overview of the retrieving data and analysis method. Subsequently, the Sec. 4 will give the empirical analysis. Afterwards, the Sec. 5 will offer the suggestion accordingly. Eventually, a brief conclusion wil be given in Sec. 6.

2. Analysis of the Trend of House Price Change & Mechanism in China

2.1 Analysis of the Trend of House Price Changes in China

For further visual analysis, the paper has listed the property prices of some cities from 2010-2019 as shown in Fig. 1, respectively, with Beijing, Shanghai, and Guangzhou selected as first-tier cities; Qingdao selected as new first-tier cities; Jinan selected as second-tier cities; and Linyi selected as third-tier cities. The property prices are measured in terms of the average sales price of residential commercial properties (CNY/square meter). According to the above statistics, the average sales prices of residential commercial properties in several cities of different tiers have generally shown an upward trend during 2010-2019, with some minor fluctuations, but not affecting the general growth trend. Besides, the average sales prices of residential commercial properties in first-tier cities, represented by Beijing, Shanghai and Guangzhou, are much higher than those in second- and third-tier cities, even reaching a multiplicative relationship. The growth of property prices in first-tier cities is also much greater than that in second- and third-tier cities, with prices in 2019 being about twice as high as those in 2010. Since 2014, the growth of property prices has increased significantly. It is obvious that the growth of property prices in first-tier cities has slowed down slightly since 2017, but property prices in new first-tier cities as well as second- and third-tier cities are still in a state of continuous growth.

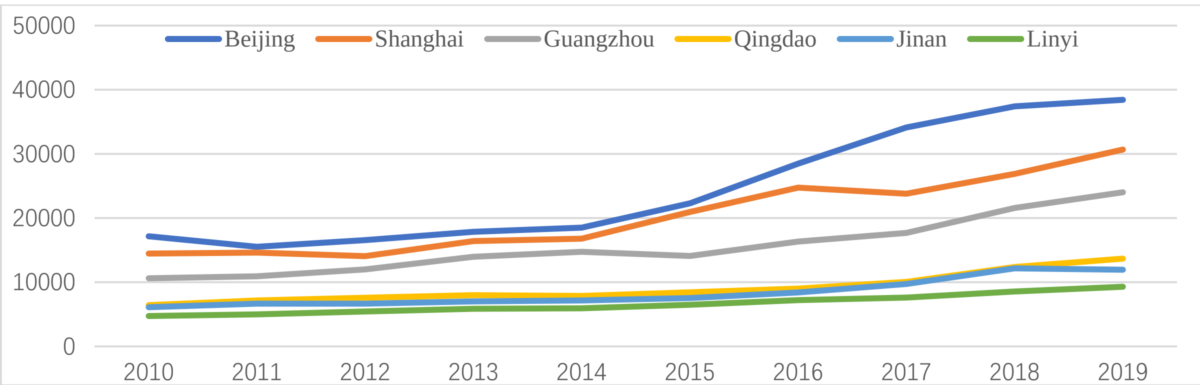

Figure 1. Data on house price changes in six cities, 2010-2019.

2.2 Mechanism Analysis

When each family spends a large amount of money to purchase property, the wealth of the family's property holdings will also change as property prices change, which will inevitably have an impact on the consumption of each family. According to the data of recent years, property prices are in an upward trend, so the rise of property prices will lead to the rise of the wealth. The paper needs to analyze the impact of property tax on property wealth. Finally, after implementing novel factors, the significance of the findings is observed. Based on the conclusions obtained from the empirical analysis, corresponding suggestions are given in relation to the reality. Accordingly, the following research hypotheses are proposed: Hypothesis 1, the growth of property wealth has a positive contribution to household consumption; Hypothesis 2, property tax has a negative inhibitory effect on the wealth effect of property.

Table 1. Meanings of explanatory variables, explained variables, and control variables

Name of the variable	Symbols of variables	Definition of a variable
Explained variables		
Total consumption	lnconsume	The logarithm of total consumption (CNY). Total consumption = living consumption + enjoying consumption
Living consumption	lnlivecon	The logarithm of household spending on food, electricity, water and gas, daily necessities, transportation, telephone and internet, clothing, and medical care (CNY).
Enjoying consumption	lnjoycon	The logarithm of household spending on beauty care, household services, culture and entertainment, decoration and maintenance, education and training, car purchase, travel, health and fitness, and online shopping on behalf of the family (CNY)
Real estate wealth effect	lnhwe	The logarithm of the ratio of total consumption to homeing assets(%)
Explanatory variables		
Housing assets	lnhouse	The logarithm of total housing assets (CNY)
Property tax	lnhousetax	The logarithm of the value of the property tax index multiplied by home assets (CNY)
Control variables		
Total household income	lnincome	The logarithm of annual household income (CNY)
Family Size Status	family_size	Number of family members
Gender Status	gender	If the respondent is male, the value is 1, otherwise it is 0
Age Status	age	Age of respondents, older than 16 years and younger than 90 years
Age Squared	age2	age*age
Marital status	marriage	If the respondents unmarried took value 1, married took value 2, cohabiting took value 3, separated took value 4, divorced took value 5, widowed took value 6
Education level	education	If the respondents did not go to school value 1, elementary school value 2, junior high school value 3, high school value 4, junior college/vocational high school value 5, college/higher vocational value 6, undergraduate degree value 7, master's degree value 8, doctoral degree value 9
Health status	health	If the respondent's health is very good take the value 1, good take the value 2, average take the value 3, bad take the value 4, very bad take the value 5

3. Data & Method

3.1 Source of Data

The data used in the follow-up of this paper were obtained by questionnaire from Southwest University of Finance and Economics in 2019 in 29 provinces across China and compiled by the author. This data, in addition to the basic demographic characteristics survey, includes household financial data. Because of its high accuracy and relatively complete data, this data has been used in many similar studies. Through further selection and screening, a total of 30,874 sample data in 2019 were finally selected for empirical analysis in this paper.

3.2 Variable Setting and Descriptive Statistics

Based on subsequent data analysis, this paper will address the following questions: 1. how house prices affect on household consumption; 2. whether property tax has an effect on property wealth effect. Since scholars have previously conducted more research on property wealth and household consumption, this paper will focus on analyzing the effect of property tax on household consumption and analyzing whether it has a facilitating or inhibiting effect. Table 1 lists the variable meanings of explanatory variables, explained variables, and control variables.

As for explained variables, regarding the property wealth effect, the explained variable in this paper is household consumption expenditure, which is measured according to the questions of the CHFS questionnaire, for household consumption expenditure. Referring to the classification of Pan and Liu, this paper further classifies household consumption expenditure into living consumption as well as enjoying consumption [8]. Living consumption expenditure includes various types of consumption expenditure on clothing, food, housing, and transportation, which are divided into: food expenditure, living expenditure, communication and transportation expenses, clothing expenditure, and housing expenditure. Enjoying consumption includes cultural and entertainment expenditures, travel expenditures, and beauty expenditures. Regarding to the impact of property tax on household consumption, this paper refers to the study of Lin, which defines real estate wealth effect as the ratio of total consumption to homeing assets as the explanatory variable [9].

With regard to explanatory variables, as for the property wealth effect, the explanatory variable is housing assets. Regarding to the effect of property tax on property wealth effect, this paper defines property tax as the product of the whole-day average of property tax index (data source: Baidu index) and household property wealth for the whole year of 2019 as the explanatory variable.

Table 2. Basic data characteristics of variables

variables	N	mean	p50	sd	min	max
lnconsume	30874	10.84	10.87	1.016	6.581	18.95
lnlivecon	30874	10.59	10.66	0.922	6.125	14.64
lnjoycon	30874	8.222	8.650	2.653	0	18.95
lnhouse	30874	12.41	12.61	1.899	0.693	16.93
lnhwe	30874	0.382	0.169	0.778	0.00100	11.80
lnhousetax	30874	20.36	20.57	1.915	7.959	24.89
lnincome	30869	3.556	0	4.035	0	15.52
family_size	30874	2.029	1	1.498	1	15
gender	30874	0.766	1	0.423	0	1
age	30874	58.45	58	13.26	20	103
age^2	30874	3592	3364	1555	400	10609
marriage	30874	2.402	2	1.206	1	6
education	30874	3.336	3	1.607	1	9
health	30874	2.738	3	1.002	1	5

For control variables, there are many variables that affect household consumption expenditure, and according to the study of Zhang and Yao, the paper selected the following six control variables: The following six control variables: age status, gender status, education level status, marital status, physical status, and total net household income [10].

Table 2 presents the results of basic data characteristics of variables, from which it can be seen that the mean logarithm of total household consumption expenditure is 10.84, while the subsistence consumption is 10.59, and the enjoyment consumption is 8.222, which indicates that in household consumption, subsistence consumption is more dominant compared to enjoyment consumption. It is also worth noting that the standard deviations of the three consumption types are 1.016, 0.922 and

2.653 in order, with the largest standard deviation for enjoyment consumption. Hence, the difference in the ability of different households in enjoyment consumption is much larger than that of survival consumption. The demographic data shows that the mean value of population size is 2.029, indicating that most family members are 2-3; the mean value of overall respondents' age is at 58 years old, with a minimum age of 20 and a maximum age of 103, indicating that the research subjects already have the basic social cognitive ability, further consolidating the authenticity of the data.

3.3 Model Setting

This study focuses on the effect of property values on household consumption and the effect of property taxes on the wealth effect of property, using CHFS 2019 data and applying a benchmark regression model, the model is set up as follows

$$lnconsum = \alpha_0 + \beta \cdot lnhouse + \alpha \cdot X + \varepsilon \tag{1}$$

$$lnlivecon = \alpha_0 + \beta \cdot lnhouse + \alpha \cdot X + \varepsilon \tag{2}$$

$$lnjoycon = \alpha_0 + \beta \cdot lnhouse + \alpha \cdot X + \varepsilon \tag{3}$$

$$lnhwe = \alpha_0 + \beta \cdot lnhousetax + \alpha \cdot X + \varepsilon \tag{4}$$

Where lnconsume, lnjoycon, lnlivecon, lnhousetax, and lnhwe denote the logarithm of total household consumption expenditure, the logarithm of enjoyment consumption, the logarithm of survival consumption, property taxes, and the property wealth effect, respectively, ε denotes the random error term, and X denotes all control variables.

Table 3. Impact of housing assets on household consumption

VARIABLES	lnconsume	lnlivecon	lnjoycon
lnhouse	0.186***	0.167***	0.340***
lnincome	0.032***	0.022***	0.088***
family_size	0.074***	0.065***	0.163***
gender	-0.041***	-0.041***	0.042
age	-0.007***	0.005**	-0.036***
age^2	-0.000***	-0.000***	-0.000
marriage	-0.045***	-0.051***	-0.054***
education	0.131***	0.104***	0.291***
health	-0.066***	-0.070***	-0.118***
Constant	8.868***	8.597***	4.993***
Observations	30,869	30,869	30,869
R-squared	0.449	0.397	0.289

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

4. Empirical Analysis

4.1 Effect of Property Value on Household Consumption

Seen from Table 3, it is observed that an increase in housing wealth significantly contributes to total household consumption expenditure, subsistence consumption expenditure and enjoyment consumption expenditure. All of them have a 1% level of significance in statistical significance. From this, it can be concluded that the mechanism of influence that in fact with the increase in housing wealth.There is a wealth effect that boosts all aspects of household consumption expenditures is completely correct. It can be drawn that there is a significant effect of household size on total household consumption expenditure, which is manifested by a stronger positive effect of household size. Gender differences also have a significant negative differential effect on both effects. It is worth noting that age has a significant negative effect on total household consumption expenditure as well as on enjoyment consumption expenditure with a 1% level of significance in statistical significance. This indicates that for older people, life may be relatively frugal and therefore for all daily expenditures are reduced accordingly. The regression results show that housing wealth has a positive contribution to household consumer spending, but its effect differs for different types of consumption. The effect of housing wealth on total household consumption is 0.186, while the effect of subsistence consumption is 0.167, which is smaller than the effect of enjoyment expenditure 0.340. This indicates that when property wealth increases, people tend to go for enjoyment consumption, which is in line with the general trend of people's demand for a better life in China.

4.2 Property Tax's Effect on Property Wealth

After verifying the wealth effect of property, this paper further will analyze how the property tax affects the wealth effect of property. The definitions of property tax and property wealth effect in this paper have been explained above, and the results summarized in Table 4 are obtained after conducting the benchmark regression. From the results of the regression analysis, the property tax has a significant negative effect on the property wealth effect with a coefficient of -0.344, which is statistically significant at the 1% level of significance. In other owrds, every 1% increase in property tax, the wealth effect of property will correspondingly decrease by 0.344%, indicating that the higher the property tax levy standard, the wealth effect of property on household consumption will correspondingly decrease. In this case, the phenomenon of consumption impulse brought about by rising house prices will be reduced.The property tax policy can make the real estate market fluctuate without bringing too much impact on the consumer market.

Table 4. Impact of property tax on property wealth effect

VARIABLES	lnhwe
lnhousetax	-0.344***
lnincome	0.014***
family_size	0.021***
gender	-0.077***
age	-0.002
age2	0.000
marriage	-0.016***
education	0.085***
health	-0.029***
Constant	7.290***
Observations	30,869
R-squared	0.587

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

4.3 Robustness Test

For the sake of making what is mentioned above more reliable, this paper uses the method of data replacement to further test the stability of the results. By replacing all the above data of CHFS 2019 with the data of CHFS 2017, the regression results are presented in Table. 5 and Table. 6. Based on the results, the data of 2017 still verifies that housing assets have a positive effect on household consumption and the effect of housing assets on enjoyment consumption is greater than that on survival consumption, which confirms the previous conclusion again. Meanwhile, the property tax still has a negative and significant effect on the wealth effect of property, which is also consistent with the previous conclusion.

Table 5. Impact of housing assets on household consumption (Using data from 2017)

VARIABLES	lnconsume	lnlivecon	lnjoycon
lnhouse	0.163***	0.152***	0.395***
lnincome	0.016***	0.013***	0.062***
family_size	0.162***	0.148***	0.684***
gender	-0.146***	-0.139***	-0.367***
age	-0.011***	-0.006**	-0.081***
age2	0.000	-0.000	0.000***
marriage	-0.028***	-0.035***	0.077***
education	0.140***	0.122***	0.552***
health	-0.017**	-0.015**	-0.142***
Constant	8.632***	8.579***	1.630***
Observations	11,218	11,218	11,218
R-squared	0.430	0.390	0.342

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

Table 6. Impact of property tax on property wealth effect (Using data from 2017)

VARIABLES	lnhwe
lnhousetax	-0.361***
lnincome	0.006***
family_size	0.038***
gender	-0.103***
age	-0.001
age2	0.000
marriage	-0.012***
education	0.084***
health	-0.014***
Constant	7.708***
Observations	11,218
R-squared	0.659

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

5. Suggestions

The government should focus on increasing the income of residents. Although China's total GDP currently ranks second in the world and China's economy is in a booming stage, the GDP per capita is not very high due to the huge population base in China. In addition, the unbalanced development between the east and west of China has exacerbated the income inequality. Therefore, China needs to increase the development of the west. All government departments should work together to promote employment, where the primary solution is employment. Increasing the number of jobs and flexible employment are important ways. As a matter of fact, increasing employment rate can fundamentally increase residents' income and raise consumption level.

In addition, the government should do a good job of macro-control and control the level of house prices. Since around 2000, the rising house prices in China have put a heavy burden on some young families. Especially, the housing prices in first-tier big cities, have discouraged young people who have just graduated. Therefore, the government should introduce a series of property policies with benefits to the people more often (e.g., housing subsidies for college students, minimum down payment policies). It is necessary to increase the efforts of rural revitalization and give certain housing concessions to college talents who return to their hometowns. Bringing talents into rural areas will be more conducive to balanced urban and rural development and form a virtuous cycle.

Moreover, the government should improve the social security system. A well-developed social security system is a basic guarantee for the citizens of the country. For traditional Chinese families, the willingness to buy a house is much greater than the willingness to rent a house. In the process of trying to save to buy a house, if the society has a good social security system, it will certainly promote the consumption of each family. Thus, the government should strengthen and improve the social security system and develop different social security systems for different age groups and families with different needs.

6. Conclusion

In summary, this study investigates the impact of housing wealth on household consumption and the impact of property taxes on the property wealth effect based on the CHFS in 2017 and 2019. Based on the empirical analysis, housing wealth significantly contributes to total household consumption expenditure as well as subsistence and enjoyment consumption. The empirical results also indicates that the effect of housing wealth on enjoyment consumption is much larger than its effect on total household consumption and subsistence consumption. Overall, the property tax has a significant negative effect on housing wealth. Nevertheless, this study has some defects and shortcomings, e.g., there are limitations to the variables selected, model is too simple and the article uses only one regression analysis method. These results offer a guideline for understanding of the impact of property taxes on household consumption. In the subsequent study, the focus can be moved on analyzing how to set a reasonable property tax collection mechanism.

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