The Impact of Housing Price Volatility on Household Consumption in Northeast China Across Different Demographic Profiles

Ziyi Li[1], Zhonghao Li[1] & Yuyang Wang[1]

[1] Northeast Asian Studies College, Jilin University, Changchun, Jilin, China
Correspondence: Ziyi Li, Northeast Asian Studies College, Jilin University, Changchun, Jilin, China.

Abstract

Amidst the backdrop of an economic downturn, urban housing prices in China have exhibited substantial volatility, significantly impacting domestic demand and household consumption. Demographic characteristics of households have played a pivotal moderating role in this dynamic. Due to economic stagnation and population outflow, Northeast China has garnered heightened attention. This study employs microdata from households in Liaoning and Heilongjiang provinces, spanning from 1989 to 2015, to conduct an empirical examination. The findings indicate that rising housing prices exert a pronounced positive influence on household consumption, particularly among households with children and those headed by elderly individuals. Conversely, the educational attainment of the household head does not exhibit a statistically significant impact on the real estate wealth effect. The study concludes with policy recommendations aimed at stimulating domestic demand and stabilizing housing prices in Northeast China.

Keywords: Northeast China, housing prices, wealth effect, demographic characteristics, household consumption

1. Introduction

To promote economic prosperity in Northeast China, the real estate market, as a crucial economic engine, has continuously attracted attention from various sectors of society. However, in recent years, the efficacy of the real estate market in stimulating household consumption has shown signs of weakening, particularly in Northeast China, which faces the most pronounced aging issues in the country. Therefore, this paper aims to systematically review and analyze household data with different demographic characteristics in Northeast China to explore the moderating role of these characteristics in the impact of housing price fluctuations on household consumption, thereby providing robust support for the sustainable economic development of the region.

In the post-pandemic era, the overall economic situation has shown a downward trend. Against this backdrop, housing, as an important asset held by residents, significantly influences consumption through its price volatility. This

impact is not uniform but is significantly affected by two key factors: regional or urban differences and the diversity of household demographic characteristics.

Firstly, regional or urban differences play a critical role in the impact of housing price fluctuations on household consumption. Due to differences in economic development levels, population density, resource allocation, and other aspects across regions, the impact of housing price fluctuations on household consumption varies significantly among different cities or regions. For example, housing price fluctuations in first-tier cities may have a more significant impact on household consumption.

Secondly, the diversity of household demographic characteristics is also a crucial factor influencing the impact of housing price fluctuations on household consumption. These characteristics include various aspects such as household size, age structure, and income level, all of which affect the economic status of households and thus influence the impact of housing price fluctuations on household consumption. For example, households with minor children may be more sensitive to housing price fluctuations due to factors like educational expenses.

Given the urgent need to boost domestic demand in Northeast China, examining the wealth effect of the real estate market based on the demographic and household characteristics of the region and clarifying its impact on household consumption undoubtedly holds significant theoretical and practical relevance.

International research on the wealth effect of real estate began quite early, but views differ regarding the existence and magnitude of the real estate wealth effect. Elliot (1980) was one of the earliest to study this topic, arguing that non-financial asset wealth is unrealizable purchasing power and therefore has no impact on consumption. Case and Shiller (1987), using data from the 1970s and 1980s, studied the relationship between U.S. housing prices and household consumption, suggesting that rising housing prices increase household consumption while exerting a crowding-out effect on savings.

Domestic research on the real estate wealth effect started later, with three main perspectives emerging. The first perspective posits the existence of a wealth effect in real estate,

whereby rising housing prices promote household consumption. Liu Jianjiang et al. (2005) used the permanent income hypothesis and LC-PIH model to argue that a thriving real estate market enhances household wealth, boosts confidence in the economy, increases the short-term marginal propensity to consume, promotes household consumption, and thus drives economic growth. The second perspective suggests a crowding-out effect in real estate, where rising housing prices suppress household consumption. Wu Liping and Zhou Jianjun (2009) found through empirical research that rising housing prices significantly suppress household consumption expenditures in China, with significant regional differences in the wealth effect of housing price fluctuations and varying effects across different types of housing. The third perspective argues that there is no wealth effect in real estate. Li Tao and Chen Binkai (2014) found that housing assets primarily exhibit consumption attributes, with only a weak "asset effect" and no "wealth effect," indicating that rising housing prices do not help increase household consumption in China.

In recent years, China's aging population has become increasingly significant, with its impact on housing prices and the wealth effect becoming more evident. According to Li Siying (2022), there is a chain transmission relationship between demographic structure, housing prices, and household consumption, with significant regional differences in this transmission mechanism across China's eastern, central, and western regions. Additionally, Wang Chongrun and Zhao Chang (2021) further demonstrated the dual impact of population aging: on one hand, it promotes housing price increases based on bequest motives; on the other hand, it suppresses housing price increases based on a preference for risk-free assets. More importantly, this impact shows significant heterogeneity across different regions. Therefore, incorporating demographic variables into the consideration of the real estate wealth effect and conducting in-depth research on the aging problem in Northeast China is both reasonable and necessary.

Given the background of housing market price volatility, this paper makes the following preliminary hypotheses regarding the consumption patterns of households with different demographic characteristics:

(1) When housing prices rise, the wealth of property owners increases, which in turn promotes spending on child-rearing expenses. Therefore, the wealth effect of real estate is more pronounced for households with children.

(2) Households with higher educational attainment, due to having more information, can make more scientific and rational decisions in the real estate market. This ability allows them to better withstand market fluctuations, maintaining confidence in unrealized wealth effects, thereby adopting a more optimistic attitude towards increasing consumption.

(3) Based on the rigorous analysis of the life-cycle permanent income hypothesis, the marginal propensity to consume is relatively higher for elderly groups. Therefore, in the context of rising housing prices, the wealth effect of real estate is more pronounced for the elderly population.

2. Method

2.1 Data Sources and Variable Selection

2.1.1 Data Sources and Processing

The data for this study were obtained from the China Health and Nutrition Survey (CHNS) database, which includes a total of 4,171 household samples from Liaoning Province and 3,310 household samples from Heilongjiang Province. During the empirical analysis, questionnaires with missing key variables and those with obviously unreasonable data were excluded to ensure the accuracy and reliability of the analysis results. For the economic indicators in the questionnaire that have been adjusted using the Consumer Price Index (CPI), this study further took the logarithm of the deflated data to eliminate the potential heteroscedasticity effect.

2.1.2 Explanation of Variables and Classification Standards

Household Consumption Level: The household consumption level is the dependent variable in the equation. In the CHNS database, total consumption can be divided into durable goods consumption and non-durable goods consumption.

The sum of these two types of consumption is used to represent overall household consumption.

Household Income: The CHNS longitudinal survey constructs the total income level for each household for each survey year, which can be considered as the current income of each household.

Real Estate Wealth Value: The household survey includes a question: "What is the current value of the house/apartment your family resides in?" Similar to previous studies, this value is used to represent the household's real estate value.

Additionally, scholars such as Michae (1997), Hassett (2000), and Nahuis (2002) argue that stock price fluctuations introduce uncertainty, leading to uncertainty in household stock wealth. Moreover, consumption responses to stock price fluctuations are lagged, rendering the wealth effect of stocks insignificant. For Northeast China, the regional stock market is also underdeveloped. Therefore, the consumption model constructed in this paper does not include the impact of the financial market.

This study aims to categorize households with different demographic characteristics and conduct regression analyses for different categories. The classification criteria mainly include three aspects: whether there are children (minors) in the household, whether the head of the household has received a college education, and whether the head of the household is elderly (aged 60 and above).

2.2 Descriptive Statistics

Table 1. Number and Proportion of Households with Various Demographic Characteristics in Liaoning Province by Year

Demographic Characteristics	1989	1991	1993	2000	2004	2006	2009	2011	2015	Total
Households with Children	256	272	263	268	154	115	80	65	88	1,561
Proportion	53.4%	62.7%	66.8	57.8%	32.4%	23.9%	16.5%	13.6%	18.4%	62.6%

Households without Children	223	162	131	196	322	367	406	412	391	2,610
Proportion	46.6%	37.3%	33.2	42.2%	67.6%	76.1%	83.5%	86.4%	81.6%	37.4%
Head with College Education	80	48	58	203	56	61	55	55	74	690
Proportion	16.7%	11.1%	14.7	43.8%	11.8%	12.7%	11.3%	11.5%	15.4%	16.5%
Head without College Education	399	386	336	261	420	421	431	422	405	3,481
Proportion	83.3%	88.9%	85.3	56.3%	88.2%	87.3%	88.7%	88.5%	84.6%	83.5%
Young Household Head	436	386	336	376	352	338	326	303	270	3,123
Proportion	91.0%	88.9%	85.3	81.0%	73.9%	70.1%	67.1%	63.5%	56.4%	74.9%
Elderly Household Head	43	48	58	88	124	144	160	174	209	1,048
Proportion	9.0%	11.1%	14.7	19.0%	26.1%	29.9%	32.9%	36.5%	43.6%	25.1%

Data Source: CHNS Database.

Table 2. Number and Proportion of Households with Various Demographic Characteristics in Heilongjiang Province by Year

Demographic Characteristics	1997	2000	2004	2006	2009	2011	2015	Total
Households with Children	269	268	194	161	97	75	67	1,131
Proportion	48.1%	44.6%	30.0%	22.3%	14.0%	11.1%	12.0%	26.0%
Households without Children	205	201	283	315	390	402	383	2,179
Proportion	51.9%	55.4%	70.0%	77.7%	86.0%	88.9%	88.0%	74.0%
Head with College Education	113	117	54	68	59	51	53	515
Proportion	23.8%	24.9%	11.3%	14.3%	12.1%	10.7%	11.8%	15.6%
Head without College Education	361	352	423	408	428	426	397	2795
Proportion	76.2%	75.1%	88.7%	85.7%	87.9%	89.3%	88.2%	84.4%
Young Household Head	425	414	387	384	365	350	303	2628
Proportion	89.7%	88.3%	81.1%	80.7%	74.9%	73.4%	67.3%	79.4%
Elderly Household Head	49	55	90	92	122	127	147	682
Proportion	10.3%	11.7%	18.9%	19.3%	25.1%	26.6%	32.7%	20.6%

Data Source: CHNS Database.

Based on the data presented in the tables, the following trends can be summarized:

Firstly, in terms of the proportion of households with and without children, the proportion of households without children has gradually increased over time, while the proportion of households with children has gradually decreased. This indicates that more families are choosing not to have children as time progresses.

Secondly, regarding the proportion of household heads with and without a college education, the proportion of household heads with a college education has steadily increased

over time, whereas the proportion of household heads without a college education has correspondingly decreased. This suggests that an increasing number of household heads have attained higher education over time.

Thirdly, in the context of young versus elderly household heads, the proportion of young household heads has gradually declined over time, whereas the proportion of elderly household heads has increased. This indicates that the proportion of elderly individuals in households is rising, while that of young individuals is decreasing over time.

In summary, over time, the family structure in Northeast China has undergone significant changes. More families are choosing not to have children, more household heads are achieving higher education, and the proportion of elderly individuals within households is gradually increasing.

2.3 Model Construction

This paper employs the Life-Cycle Permanent Income Hypothesis (LC-PIH) proposed by Blanchard and Fisher (1989), incorporating household wealth and income into the analysis of consumption behavior. The derivation process is omitted for brevity, and the optimal consumption equation is simplified as follows:

$$c_t = \frac{r}{1+r} A_t + \frac{r}{1+r} \sum_{t=0}^{\infty} (1+r)^{-i} E_t Y_{t+i}$$

Which can be further simplified to:

$$c_t = \beta_1 A_t + \beta_2 YP$$

Where c_t represents the household consumption level at time t, A_t represents household wealth, YP represents household income. As previously explained, financial asset wealth, represented by stock prices, has an insignificant impact on consumption, and the CHNS database does not provide suitable data for this variable. Therefore, A_t specifically represents household real estate wealth, denoted as HW.

Based on the LC-PIH model, we construct the following model to study the wealth effect under different demographic characteristics:

$$\ln C = \beta_0 + \beta_1 LnYP + \beta_2 LnHW$$

Where $\ln C$, $\ln YP$, and $\ln HW$ represent the natural logarithms of household consumption, household income, and housing prices, respectively.

3. Results Empirical Findings and Analysis

Following the classification methods mentioned earlier, this section performs coefficient regressions on microdata from households in Liaoning and Heilongjiang provinces from 1989 to 2015 to analyze how differences in household demographic characteristics lead to varied impacts of housing price fluctuations on household consumption. The regression results are as follows.

3.1 Empirical Results and Analysis by Household Composition (with or Without Children)

Table 3. Empirical Results by Household Composition (Liaoning and Heilongjiang Provinces)

Variables	Household Consumption (*LnC*)			
	Liaoning Province		Heilongjiang Province	
	Households with Children	Households without Children	Households with Children	Households without Children
LnYP	0.384***	0.366***	0.444***	0.406***
	(0.0461)	(0.0631)	(0.0730)	(0.0571)
LnHW	0.160***	0.112**	0.172***	0.0100
	(0.0374)	(0.0439)	(0.0486)	(0.0439)
_cons	2.765***	2.953***	2.528***	3.449***
	(0.414)	(0.555)	(0.653)	(0.580)

Note: ***, **, and * indicate significance at the 1%, 5%, and 10% levels, respectively; values in parentheses are t-values.

Analysis of the data in the table indicates that, whether in Liaoning Province or Heilongjiang Province, households with children exhibit a more significant increase in consumption in response to rising household income or real estate value compared to households without children.

This result is closely related to the traditional Chinese concept of "raising children for old age". According to the theory of household saving demand, parents do not view the expenditure on raising children as a sunk cost but as a long-term investment, aiming to secure support from their children during old age when they can no longer earn a stable income. This traditional mindset is particularly strong in Northeast China, where there is a high emphasis on future generations. Therefore, as household income increases, spending on child-rearing also rises.

Similarly, if housing prices increase, homeowners possess more wealth and are likely to spend more on their children, making the real estate wealth effect more pronounced. Thus, the wealth effect of real estate is stronger for households with children in Northeast China.

3.2 Empirical Results and Analysis by Household Head's Education Level

Table 4. Empirical Results by Household Head's Education Level (Liaoning and Heilongjiang Provinces)

Variables	Household Consumption (LnC)			
	Liaoning Province		Heilongjiang Province	
	Head with College Education	Head without College Education	Head with College Education	Head without College Education
$LnYP$	0.562***	0.351***	0.0383	0.470***
	(0.209)	(0.0461)	(0.164)	(0.0475)
$LnHW$	0.0643	0.0850**	0.375***	0.0307
	(0.137)	(0.0347)	(0.139)	(0.0342)
_cons	1.626	3.533***	3.959**	3.096***
	(1.810)	(0.395)	(1.784)	(0.461)

Note: ***, **, and * indicate significance at the 1%, 5%, and 10% levels, respectively; values in parentheses are t-values.

In Liaoning and Heilongjiang provinces, the intermediary role of the household head's education level exhibits distinct differences. In Liaoning, households with higher educational attainment show a more significant increase in consumption with rising income compared to those with lower educational attainment, but exhibit no noticeable change in consumption with rising real estate prices. Conversely, in Heilongjiang, households with college-educated heads do not show significant consumption increases with rising income but do exhibit significant increases with rising real estate prices.

This paper offers plausible explanations for these empirical results based on the specific conditions in Liaoning and Heilongjiang:

Firstly, Liaoning's rapid economic growth, vibrant commercial activities, and favorable consumption environment provide more opportunities for consumption growth among households with college-educated heads following income increases. In contrast, Heilongjiang, as a major agricultural province with a large rural population base, faces several consumption environment constraints, such as relatively fewer product varieties, inconsistent service quality, and underdeveloped consumption facilities. These potential limitations might suppress the consumption willingness and potential of college-educated household heads to some extent.

Secondly, with the rapid economic growth in Liaoning, residents face increasing living pressures. In this context, households with higher educational attainment tend to make more prudent consumption decisions when

housing prices rise, thereby diminishing the real estate wealth effect among this group. Conversely, in Heilongjiang, where macroeconomic pressures are relatively lower, well-educated residents can quickly capture information about rising housing prices and form scientific and rational expectations. They enhance current consumption through the "unrealized" wealth effect. Additionally, the

borrowing constraint effect resulting from rising housing prices encourages these households to use their homes as collateral to obtain consumer loans, thereby maintaining higher consumption levels. Therefore, in Heilongjiang, rising housing prices have a significant positive wealth effect on college-educated households.

3.3 Empirical Results and Analysis by Household Head's Age

Table 5. Empirical Results by Household Head's Age (Liaoning and Heilongjiang Provinces)

Variables	Household Consumption (LnC)			
	Liaoning Province		Heilongjiang Province	
	Young Household Head	Elderly Household Head	Young Household Head	Elderly Household Head
LnYP	0.323***	0.555***	0.403***	0.443***
	(0.0466)	(0.118)	(0.0479)	(0.114)
LnHW	0.0731**	0.188**	0.0638*	0.0752
	(0.0352)	(0.0862)	(0.0361)	(0.0742)
_cons	4.021***	0.0565	3.548***	2.539**
	(0.402)	(1.038)	(0.474)	(1.003)

Note: ***, **, and * indicate significance at the 1%, 5%, and 10% levels, respectively; values in parentheses are t-values.

Empirical analysis indicates that in Liaoning and Heilongjiang provinces, elderly household heads demonstrate a more pronounced increase in consumption in response to income growth compared to their younger counterparts. This phenomenon can be attributed to the early economic development of Northeast China, where a cohort of successful entrepreneurs settled in Liaoning and are now entering retirement. According to the life-cycle hypothesis, income in old age often surpasses consumption needs. Additionally, with the steady improvement in China's socio-economic conditions, the elderly population has gradually adopted a more proactive consumption attitude. Furthermore, with ample leisure time, they tend to increase expenditures on personal interests. In contrast, younger household heads, often in the early stages of their careers or family formation, face substantial economic pressures, such as purchasing homes and raising children, which may constrain their consumption when housing prices rise.

Regarding regional differences, Liaoning's elderly care industry is likely more developed,

offering a broader range of products and services tailored to the elderly. This development allows the elderly to find more avenues for consumption when housing prices increase. Conversely, Heilongjiang's elderly care industry may be relatively underdeveloped, resulting in less significant increases in consumption among elderly household heads in response to rising housing prices.

4. Conclusion and Discussion

This study deeply explores the wealth effects of capital and real estate in Northeast China, with a special focus on households with children and the influence of the household head's education level and age on consumption decisions. The results show that the wealth effects of capital and real estate are significantly present in Northeast China, especially among households with children, where the real estate wealth effect is more pronounced.

Further analysis reveals that education level and age significantly impact household consumption decisions. In Liaoning Province, households with college-educated heads exhibit more

substantial consumption growth with rising income compared to those with lower education levels, but show no significant change in consumption with rising real estate prices. Conversely, in Heilongjiang Province, households with college-educated heads show a strong sensitivity to rising real estate prices, with significant increases in consumption when housing prices rise. This difference may be related to the economic structure, consumption environment, and residents' expectations and reactions to rising housing prices in the two provinces.

Regarding age differences, elderly household heads show more significant consumption growth with rising income, likely due to their retirement stage, ample leisure time, and more proactive consumption attitudes. This is particularly evident in Liaoning Province, where elderly household heads show more significant consumption increases with rising housing prices, possibly due to the province's mature elderly service industry and diverse consumption channels available to the elderly.

To further optimize the consumption environment in Northeast China and promote economic growth, we propose the following policy recommendations:

Firstly, the government should continue to implement stable real estate policies to ensure housing prices fluctuate within a reasonable range, avoiding the suppressive effect of rapid price increases on household consumption. Additionally, for households with children, the government could consider introducing housing support policies, such as purchase subsidies and preferential loans, to alleviate housing pressure and stimulate consumption growth.

Secondly, education is a crucial pathway to improving household income levels and consumption capabilities. The government should increase investment in education, enhance the prevalence of higher education, and encourage residents to pursue continuing education to improve their employment competitiveness and consumption potential.

Thirdly, given the high proportion of elderly population in Northeast China, the government should actively promote the development of the elderly service industry, offering diverse elderly service products to meet the consumption needs of the elderly. Additionally, enhancing the training of elderly service personnel and

improving service quality will create a more comfortable and convenient consumption environment for the elderly.

Fourthly, Liaoning and Heilongjiang provinces should strengthen regional cooperation to jointly promote balanced regional economic development. By optimizing industrial structures and facilitating labor mobility, the economic development gap between the two provinces can be narrowed, improving the overall living standards of residents. Additionally, enhancing policy communication and coordination will create synergy and jointly drive the prosperity and development of the Northeast region.

References

Case, K. E., Quigley, J. M., & Shiller, R. J. (2005). Comparing wealth effects: the stock market versus the housing market. *Topics in Macroeconomics*, *5*(1), 20121001.

Elliott, J. W. (1980). Wealth and wealth proxies in a permanent income model. *The Quarterly Journal of Economics*, *95*(3), 509-535.

Feng, D. (2008). The correlation analysis between the education level of highly educated people and consumption behavior. Doctoral dissertation, Southwest University.

Ju, F., Xu, Y., & Cai, L. (2020). The impact of population age structure and housing prices on urban household consumption. *Theory and Practice of Finance and Economics*, (05), 104-109.

Li, S. (2022). Population structure, housing prices, and household consumption: An empirical study based on provincial panel data in China. *China Real Estate*, (06), 6-18.

Li, T., & Chen, B. (2014). Household fixed assets, wealth effect, and household consumption: Empirical evidence from urban households in China. *Economic Research Journal*, *49*(3), 62-75.

Liu, J., Yang, Y., & Yuan, D. (2005). The mechanism of real estate wealth effect from the perspective of consumption function theory. *Consumer Economics*, *21*(2), 93-96.

Pei, Y., & Xu, W. (2017). Real estate wealth and household consumption in China: An empirical analysis based on CFPS data. *Journal of Audit & Economics*, *32*(4), 93-104.

Skinner, J. (1989). Housing wealth and aggregate saving. *Regional Science and Urban Economics*,

19(2), 305-324.

Wang, B., Cheng, L., & Wang, S. (2018). The spatial and temporal evolution characteristics of the population structure and migration in Northeast China. *Journal of Northeast Normal University (Natural Science Edition), 50*(1), 130-137.

Wang, Z., & Zhao, C. (2021). The relationship between population aging, wealth effect, and housing prices. *Price Theory & Practice*, (02), 105-108.

Wang, Z., Xu, X., & Xu, H. (2008). Theory and empirical research on the wealth effect of the real estate market. *Finance & Trade Economics*, (12), 116-122.

Wu, L., & Zhou, J. (2009). An empirical analysis of the impact of housing price fluctuations on consumption expenditure. *Theory and Practice of Finance and Economics*, (1).

Wu, W., & Zhou, Q. (2019). Housing prices and the residential arrangements of middle-aged and elderly people: An empirical analysis based on two-period panel data of CHARLS. *Finance and Economics Science*, (12), 40-52.

Zhao, Y., Zhang, Y., & Zhao, W. (2011). The relationship between the real estate market, household consumption, and economic growth: An empirical analysis based on the wealth effect of the real estate market from 1994 to 2011. *Economic Science*, (6), 30-41.

Zheng, W., Han, X., & Lian, Y. (2022). The impact of population age structure on household consumption. *Cooperative Economy and Technology*, (18), 70-73.