

## Article

# Difference in Housing Finance Usage and Its Impact on Housing Wealth Inequality in Urban China

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**Abstract:** With the increasing importance of financial loans in home purchases in urban China, the role of housing loans in the accumulation of housing wealth needs to be unraveled. Using the data from the 2017 China Household Finance Survey (CHFS), this study investigates the use of housing loans and their impact on housing wealth inequality. It has been found that people with higher socioeconomic status and institutional advantages benefit more from housing provident fund loans and are more likely to fully invoke different financing channels to accumulate housing wealth. On the contrary, disadvantaged groups have to resort to costly market-based mortgages to finance their home purchases. This leads them to fall further behind in housing wealth accumulation. The spatial stratification of housing wealth accompanying the urban hierarchy was also observed and found to be closely linked to the type of housing loans. In this increasingly financialized era, relying on financial instruments in the process of household asset accumulation may further amplify the existing wealth inequality among social groups.



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**Keywords:** home loan; commercial mortgage; housing provident fund; housing asset; housing inequality

## 1. Introduction

In most developed economies, housing prices have risen much faster than wages, and housing has become an important component of household assets, playing a vital role in wealth accumulation [1]. Worldwide trends in subsidies to homeownership, privatization of social housing, and liberalization of mortgage finance have largely reshaped the distribution of housing wealth [2,3]. In China, since the implementation of housing reforms, the continuous rise in housing prices has led to the rapid expansion of housing wealth inequality over the past two decades. This phenomenon constitutes an important dimension of social inequality [4–6]. The boom in the real estate market and the increasingly prominent housing affordability problems have created a demand for housing finance, especially in large cities [7,8]. With the development of the housing finance system, it is particularly important to explore the use of housing financial instruments and their impact on housing wealth inequality [9,10].

Since the 1990s, the housing supply system in urban China has undergone a radical shift from welfare allocation to marketization. Different types of housing loans have gradually emerged and have been refined to facilitate this shift and expand access to homeownership. At present, there are two main types of housing loans, including mortgage loans issued by commercial banks and nationwide housing provident fund (HPF) loans. The housing mortgage market has grown rapidly over the past two decades, with China becoming the largest residential mortgage market in Asia by 2005 [11]. The balance of personal housing mortgages accounted for less than 1% of the balance of all loans from financial institutions in 1998 and was close to 20% in 2019 [12]. In terms of policy-based

financial support, HPF participants can withdraw account balances for housing-related consumption, such as home purchases, renovations, and renting. They can also apply for HPF loans at an interest rate 1.65–2 percentage points lower than that of commercial mortgage loans [13]. Commercial mortgage and HPF loans are widely used as financial tools to mobilize the residents' purchasing ability, but they differ in terms of interest rates, loan qualifications, and loan amounts. Due to the subsidized interest rate of HPF, if there is a mismatch between HPF depositors and lenders, the depositors will suffer interest losses while the lenders will be the beneficiaries [14].

It is common for residents to purchase homes with financial leverage in urban China. According to a survey on the assets and liabilities of Chinese urban households in 2019 by the People's Bank of China (PBC), 56.5% of urban households are in debt, while 76.8% of them have housing loans [15]. Inequality in access to housing finance creates profound impacts on wealth accumulation and social stratification [16]. However, few studies have focused on the differences in the use of different types of housing loans at the household level and how the housing financial tools that affect the accumulation of household wealth need to be investigated. A nationwide, large-scale survey makes it possible to quantitatively explore the use of housing loans and housing wealth of residents. Using the 2017 Chinese Household Finance Survey (CHFS), this study analyzes the impact of the use of housing loans on household housing wealth to provide a basis for optimizing the efficiency and fairness of the housing finance system.

## 2. Literature Review

Housing assets are a core component of household wealth, and housing wealth inequality has become an important source of social inequality [5,17]. With the privatization of social housing and the liberalization of housing finance, an increasing number of families ascend the housing ladder towards homeownership, which affects the opportunities for housing wealth accumulation [2,18]. The fact that a small number of households hold the majority of housing wealth has been confirmed in the United States, the United Kingdom, Australia, Sweden, and other countries [19–21]. In China, housing wealth accounts for more than 70% of the total household wealth [22–24]. Housing wealth inequality has expanded rapidly over the past two decades as housing prices continue to rise [25]. Researchers have noted the spatial inequality in housing wealth [26,27], with regional differences being the primary factor contributing to housing wealth disparities in China [22,28].

Access to adequate finance is critical for acquiring homeownership, as purchasing requires a concentration of large monetary payments in a short period [29,30]. To expand access to homeownership, many countries have established housing finance systems, including specialized financial institutions, contractual savings programs, public funds targeting mortgages and housing construction, and the expansion of mortgage lending provided by commercial banks [31,32]. Despite the growing availability of financial instruments, mortgage lending discrimination affects access to home finance, including commercial mortgages and social loans with subsidized interest [33]. For instance, ethnic minorities have been offered high-cost, subprime loans in the U.S. [34,35]. In Mexico, mortgages from provident funds (INFONAVIT) are restricted to individuals with formal and salaried jobs [36].

Due to the reform of the housing system in urban China, the main factors affecting housing accessibility and housing finance capacity have changed. Before the housing reforms, housing allocation was based on the position and length of service of employees in the unit, with little consideration of individual economic capacity [37]. However, in housing commoditization the market becomes the mainstay of housing supply, and personal savings become the main source of funds for housing [38]. Currently, the individual's (or household's) housing financing capacity is closely related to predictable income, occupational stability, credit history, and collateral assets [39]. The PBC clearly states that the borrower should have a valid residence status, a stable career and income, good credit history, and the ability to repay the principal and interest of the loan. For policy-based

financial support, only HPF participants are eligible to apply, so the coverage and fairness of the HPF program have been widely questioned by scholars [7,40]. Low-income families find it difficult to not only afford housing but also receive support from HPF [41,42].

Household housing wealth varies across households due to differences in the initial housing investment, mortgage debt, and capital gains and losses [2]. Toussaint [43] has found that, in the Netherlands, older households usually bought dwellings and used mortgages at the “right” time; thus, they have been able to profit from house price increases for a longer period. Relatively vulnerable groups tend to be more vulnerable in terms of access to housing mortgages because of their limited affordability. For example, young, low-income, and multi-child households have difficulty in managing mortgages sustainably to transit into homeownership [44,45]. After the global financial crisis of 2008 induced by the sub-prime mortgage crisis in the U.S., stricter qualification checks in loan applications will favor groups with stable income and fixed assets, who will also benefit from continuous real estate investment and long-term, rising housing prices [19].

Housing loans affect individuals’ access to homeownership, which affects families’ housing wealth accumulation and reshapes social inequality. Commercial mortgage loans and HPF loans represent market-based and policy-based financing channels, respectively. The mandatory savings of HPF are likely to incentivize participants to access the HPF loans earlier and take advantage of the low interest rates [46]. However, these policy-based subsidies are hard for low-income families, laid-off workers, temporary workers, and migrants [47]. The limited coverage of HPF and support for housing consumption enlarges the income gap between participants and nonparticipants [42]. Nevertheless, the limited amount of HPF loans also reduces the marginal benefits to high-income groups when they use HPF loans for home purchases [42].

With the rapid rise in housing prices and the prevalence of housing financing in recent years, it has become increasingly common for residents to resort to mortgage loans to purchase a home in urban China, although personal savings and parents’ financial support are still used as the main funds for home purchases [48–50]. Previous studies have discussed the systematic differences between mortgagors and nonmortgagors in Shanghai and Guangzhou [51,52]. However, they rarely compare the differences in the use of commercial mortgage loans, HPF loans, and combined loans at the household level. Furthermore, there is a lack of nationwide studies to capture regional disparities and urban hierarchy differences in the use of housing financial instruments and their impacts on housing wealth inequality. To fill this gap, this study investigates the differences in the use of financial instruments and their role in facilitating access to homeownership and wealth accumulation among different social groups in the era of increasing financialization.

### 3. Data and Method

#### 3.1. Data Source

The data were drawn from the 2017 China Household Finance Survey, which is a nationwide survey on household finance and assets conducted by the Southwest University of Finance and Economics (<https://chfs.swufe.edu.cn/>, accessed on 1 November 2021). This survey adopted a three stage stratified probability that is proportional to the size sampling method. The 2017 dataset covered 29 provinces, 355 districts, and 1428 neighborhoods across China, with a sample size of 40,011 households. It collected information on household assets, liabilities, insurance, and security, providing a comprehensive and detailed picture of household economic and financial behaviors. Thus, it is widely used in studying housing issues in China [53,54].

This study explores the role of housing loans in affecting household housing wealth. Since only housing in urban areas in China can be transacted where housing loans can be employed, the following analyses are confined to homeowners in urban areas. We focused on the use of loans to purchase commodity housing; hence, other housing types and respondents who did not answer questions about their use of loans were excluded. In addition, respondents who acquired homeownership before the 1998 housing marke-

tization were excluded. Considering the age limit imposed by banks on loan applicants, only respondents aged 18–65 were included in this study. After the selection, the number of samples used in this study was 6681.

Table 1 shows the profiles of the samples. The mean value of housing wealth of the samples was 1.69 million yuan, which was the estimated value in 2017 reported by respondents. Nearly 70% of the households had not used housing loans, and nearly one-fifth stated that they had used commercial mortgage loans. The share of households using HPF loans was less than one-tenth of the sample. This is consistent with the findings of previous studies that the use of commercial and HPF loans remains limited [51,52], despite their increasing importance in mobilizing funds for home purchases, especially for young households.

**Table 1.** The profile of samples ( $n = 6681$ ).

|                                          | Number/Mean | Percent/Standard Deviation |
|------------------------------------------|-------------|----------------------------|
| Housing wealth                           | 169.40      | 243.87                     |
| Mortgage use                             |             |                            |
| Nonmortgagors                            | 4634        | 69.36%                     |
| Mortgagors                               | 2047        | 30.64%                     |
| HPF                                      | 420         | 6.29%                      |
| Commercial                               | 1254        | 18.77%                     |
| Combined                                 | 162         | 2.42%                      |
| Missing                                  | 11          | 3.16%                      |
| Gender                                   |             |                            |
| Male                                     | 5050        | 75.59%                     |
| Female                                   | 1631        | 24.41%                     |
| Age                                      | 45.13       | 10.47                      |
| Marital status                           |             |                            |
| Married                                  | 6029        | 90.28%                     |
| Others                                   | 649         | 9.72%                      |
| Education                                |             |                            |
| Junior school and below                  | 2164        | 32.45%                     |
| High school                              | 1724        | 25.85%                     |
| College/vocational school                | 1107        | 16.60%                     |
| Bachelor's degree and above              | 1674        | 25.10%                     |
| Occupation                               |             |                            |
| High (Managers, etc.)                    | 1913        | 28.63%                     |
| Other                                    | 4768        | 71.37%                     |
| Working in the public sector             |             |                            |
| Yes                                      | 2511        | 37.58%                     |
| No                                       | 4170        | 62.42%                     |
| Chinese Communist Party (CCP) membership |             |                            |
| Yes                                      | 1043        | 15.61%                     |
| No                                       | 5638        | 84.39%                     |
| Hukou status <sup>1</sup>                |             |                            |
| Urban local                              | 4727        | 70.97%                     |
| Rural local                              | 1019        | 15.30%                     |
| Urban migrant                            | 368         | 5.52%                      |
| Rural migrant                            | 547         | 8.21%                      |

Table 1. Cont.

|                                  | Number/Mean | Percent/Standard Deviation |
|----------------------------------|-------------|----------------------------|
| Household size                   |             |                            |
| 1~2                              | 1723        | 25.79%                     |
| 3~4                              | 4087        | 61.17%                     |
| ≥5                               | 871         | 13.04%                     |
| Household income                 |             |                            |
| Lowest 20%                       | 0.72        | 18.82                      |
| 2nd 20%                          | 6.52        | 0.98                       |
| 3rd 20%                          | 10.11       | 1.21                       |
| 4th 20%                          | 15.98       | 2.44                       |
| Highest 20%                      | 49.44       | 58.30                      |
| Housing acquisition year         |             |                            |
| 1998–2007                        | 3180        | 47.60%                     |
| 2008–2012                        | 2069        | 30.97%                     |
| 2013–2017                        | 1432        | 21.43%                     |
| Region                           |             |                            |
| East                             | 3155        | 47.22%                     |
| Central                          | 910         | 13.62%                     |
| West                             | 1446        | 21.64%                     |
| Northeast                        | 1170        | 17.51%                     |
| Administrative level             |             |                            |
| Municipalities                   | 1297        | 19.41%                     |
| Sub-provincial cities            | 2348        | 35.14%                     |
| Other capital cities             | 749         | 11.21%                     |
| Prefectural cities               | 2287        | 34.23%                     |
| Developmental level <sup>a</sup> |             |                            |
| First-tier cities                | 1200        | 17.96%                     |
| New first-tier cities            | 2061        | 30.85%                     |
| Second-tier cities               | 1287        | 19.26%                     |
| Other cities                     | 2133        | 31.93%                     |

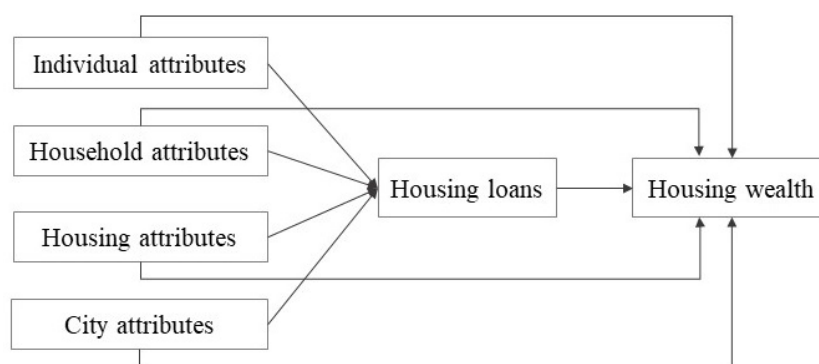
Note: <sup>a</sup> The samples are distributed in 4 first-tier cities, 14 new first-tier cities, 23 second-tier cities, and 111 other cities.

According to the development of housing and mortgage markets, we divided the time of home purchases into three periods: 1998–2007, 2008–2012, and 2013–2017, as they mark three distinct eras in the history. The end of the housing allocation in 1998 marked the new era of the housing market. In response to the global financial crisis of 2008, the State Council adopted various measures to stimulate the real estate market. In 2013, housing price control policies appeared frequently, and the Third Plenary Session of the 18th Communist Party of China Central Committee also clearly pointed out the need to “establish an open and standardized HPF system and improve the mechanism of HPF withdrawal, use, and supervision” [55]. Table 1 shows that nearly half of the samples purchased commercial housing before 2008, while 20% of the samples purchased in the past five years.

This study measured regional disparities from the following three aspects: geographic location, administrative level, and development level. Table 1 shows that nearly half of the samples were concentrated in sub-provincial and other provincial capital cities. In terms of development level, this study referred to the “City Business Charm Ranking<sup>2</sup>” published by *Yicai Magazine* in 2017 using its division of first-tier cities, new first-tier cities, and second-tier cities, with third-, fourth-, and fifth-tier cities merged into other cities. Table 1 shows that only approximately one-third of the sample were located in other cities.

### 3.2. Method

Structural equation modelling is widely used in social and behavioral sciences, within which different aspects of a phenomenon are theorized to be related to one another with a structure. This structure is a system of equations, implying statistical and often causal relationships between variables and error terms and can include multiple equations [56]. Thus, structural equation modeling provides an inference framework for mediation analyses in which an intermediate variable (also called a mediator) is introduced to help explain how or why an independent variable influences the dependent variable [57]. This study adopted a structural equation model to analyze how individual, household, and city attributes affect one's usage of housing loans, and, thereby, affects the value of housing assets that they have accumulated (Figure 1). The mediating variable in this study, “type of housing loan used”, is a categorical variable, including no loans used, HPF loans, commercial mortgage loans, and combined loans. Therefore, it was chosen for analysis in the STATA software using generalized structural equations with maximum likelihood estimation.



**Figure 1.** The framework of generalized structural equation model.

In Equation (1),  $HW_i$  represents household housing wealth,  $IND_i$  represents household heads' social and economic attributes, including educational attainment, occupational status, employer type, and CCP membership.  $HH_i$  represents household attributes, including household income and household size.  $HOU_i$  represents housing attributes, including housing acquisitional year.  $CITY_i$  represents city attributes, including geographic location, administrative level, and development level.  $LOAN_i$  represents the usage of housing loans, including no loans, HPF loans, commercial mortgage loans, and combined loans.  $C_i$  represents control variables, including the household head's gender, age, and marital status. The usage of housing loans is assumed to be affected by individual, household, housing, and city attributes, as shown in Equation (2), where  $n$  represents the reference groups, and  $m$  represents the number of loan types ( $m = 1, 2, 3$ ). The equations are as follows:

$$HW_i = \alpha_0 + \alpha_1 IND_i + \alpha_2 HH_i + \alpha_3 HOU_i + \alpha_4 CITY_i + \alpha_5 LOAN_i + \alpha_6 C_i + \varepsilon_1 \quad (1)$$

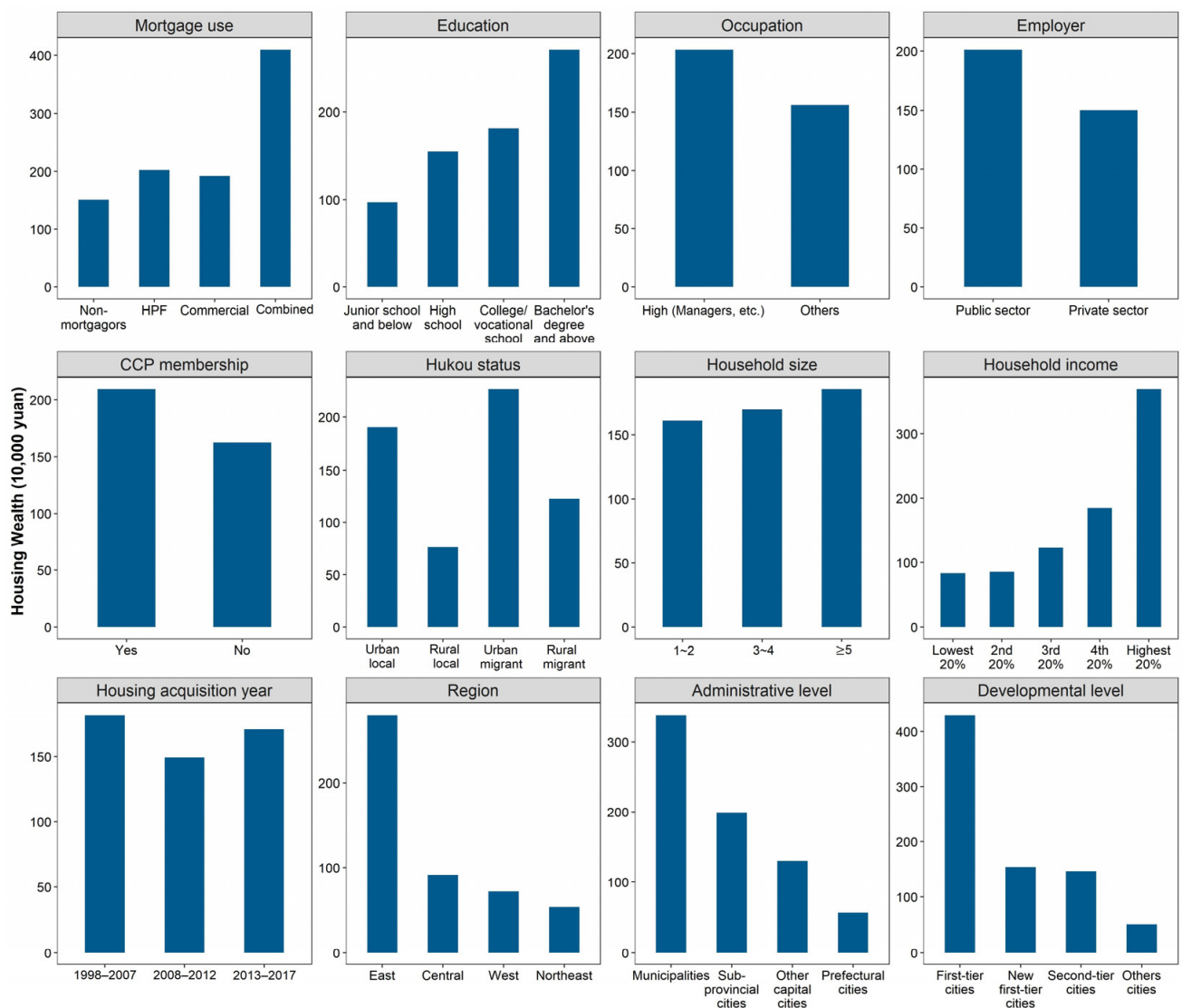
$$\ln\left(\frac{LOAN_{im}}{LOAN_{in}}\right) = \beta_0 + \beta_1 IND_i + \beta_2 HH_i + \beta_3 HOU_i + \beta_4 CITY_i + \beta_5 C_i + \varepsilon_2 \quad (2)$$

## 4. Results

### 4.1. Housing Wealth Inequality in Urban China

This section demonstrates the differences in housing wealth in terms of housing attributes, individual attributes, household attributes, and regional attributes. As shown in Figure 2, there is a significant gap between the housing wealth of loan users and nonloan users. The housing wealth of families using HPF loans is slightly higher than those using commercial loans, but the difference is not obvious, with both at around 2 million. The average housing wealth of households using combined loans is more than 4 million yuan, twice that of households using a single type of loan. This suggests that higher-value

dwellings tend to require multiple financial tools. Conversely, the more financial resources one could mobilize, the more wealth he/she could accumulate.



**Figure 2.** Housing wealth across different groups.

In terms of individual socioeconomic attributes, we show the differences in housing wealth in terms of household head characteristics from market factors (education and occupation) and institutional factors (type of work unit, CCP membership, and type of *hukou*). There is a significant difference in housing wealth among household heads with different educational attainment. The average housing wealth of household heads with bachelor degrees or higher is 2.7 million yuan, while that of household heads with junior school education or less is only 0.97 million yuan. The housing wealth of household heads with higher occupational status, working in public sectors, and CCP membership is higher than that of other groups, averaging about 2 million yuan and 1.5 million yuan, respectively. The housing wealth of urban *hukou* holders is significantly higher than that of rural *hukou* holders, while the housing wealth of migrants is slightly higher than that of locals. In general, people with higher socioeconomic status have obvious advantages in housing wealth accumulation, among which the differences are mainly reflected in educational attainment and *hukou* status.

There is no significant difference in housing wealth among households of different sizes, but housing wealth varies significantly across household incomes. The housing

wealth of the highest 20% of households reached 3.7 million yuan, more than four times that of the bottom 40%, and about three times that of the middle 20% of households (1.23 million yuan). A large inequality is noted in housing wealth among households with different incomes. The results found no significant differences in housing wealth with regard to the year of acquisition. This may be because housing values are more sensitive to location rather than the year of acquisition. Those apartments acquired in recent years are more likely to be located in the suburbs; thus, housing value by the year of acquisition does not exhibit a regular pattern.

We found that housing wealth also varies significantly across cities<sup>3</sup>. Housing wealth in the eastern region reaches 2.8 million yuan, while the northeastern region is the lowest at 0.53 million yuan. Housing wealth shows a gradient pattern across the administrative levels of cities. The average household housing wealth in municipalities directly under the central government is as high as 3.38 million yuan, while in sub-provincial cities and other provincial capitals it is 1.99 million yuan and 1.3 million yuan, respectively. In prefecture-level cities, it is only 0.57 million yuan. Seen from an urban hierarchy perspective, household housing wealth shows a more disparate polarization. The average household wealth in first-tier cities reaches 4 million, which is about three times that of new first-tier and second-tier cities and is 7.5 times that of other cities.

#### 4.2. Impacts of Housing Loans on Housing Wealth

This section examines the effect of housing loans on housing wealth through generalized structural equation modeling and divides the usage of housing loans into HPF loans, commercial mortgages, and combined loans, with nonloan users as the reference group. The second to fourth columns of Table 2 show the influence of individual, family, housing, and city attributes on the use of housing loans. Men were less likely to use commercial mortgages. The probability of using home loans decreased with age as younger people might have limited savings and need to finance their purchases through home loans. Married people are more likely to use commercial mortgage loans than nonmarried individuals.

**Table 2.** The results of the generalized structural equation model.

|                                        | Mortgage Use (Ref. Nonmortgagors) |                       |                       | Housing Wealth       |
|----------------------------------------|-----------------------------------|-----------------------|-----------------------|----------------------|
|                                        | HPF Loans                         | Commercial            | Combined              |                      |
| Mortgage use (ref. nonmortgagors)      |                                   |                       |                       |                      |
| HPF loans                              |                                   |                       |                       | 0.148 ***<br>(0.049) |
| Commercial                             |                                   |                       |                       | 0.279 ***<br>(0.032) |
| Combined                               |                                   |                       |                       | 0.331 ***<br>(0.078) |
| Gender (ref. Female)                   | 0.103<br>(0.133)                  | −0.143 *<br>(0.083)   | 0.344<br>(0.223)      | −0.024<br>(0.028)    |
| Age                                    | −0.029 ***<br>(0.007)             | −0.032 ***<br>(0.004) | −0.066 ***<br>(0.012) | 0.006 ***<br>(0.001) |
| Marital status (ref. nonmarried)       | 0.106<br>(0.221)                  | 0.304 **<br>(0.135)   | 0.567<br>(0.368)      | 0.109 **<br>(0.043)  |
| Education (ref. Junior school & below) |                                   |                       |                       |                      |
| High school                            | 0.402 *<br>(0.209)                | 0.145<br>(0.099)      | 1.009 **<br>(0.484)   | 0.196 ***<br>(0.032) |
| College/vocational school              | 0.707 ***<br>(0.215)              | 0.228 *<br>(0.119)    | 1.304 ***<br>(0.480)  | 0.320 ***<br>(0.039) |
| Bachelor's degree and above            | 0.789 ***<br>(0.217)              | 0.204<br>(0.124)      | 1.486 ***<br>(0.473)  | 0.450 ***<br>(0.041) |

Table 2. Cont.

|                                                | Mortgage Use (Ref. Nonmortgagors) |                       |                      | Housing Wealth        |
|------------------------------------------------|-----------------------------------|-----------------------|----------------------|-----------------------|
|                                                | HPF Loans                         | Commercial            | Combined             |                       |
| High occupation status                         | 0.353 ***<br>(0.118)              | 0.063<br>(0.086)      | 0.361 *<br>(0.184)   | −0.062 **<br>(0.028)  |
| Working in the public sector                   | 1.030 ***<br>(0.130)              | −0.290 ***<br>(0.089) | 0.444 **<br>(0.196)  | 0.006<br>(0.028)      |
| CCP membership                                 | 0.004<br>(0.135)                  | 0.007<br>(0.104)      | 0.286<br>(0.202)     | −0.019<br>(0.033)     |
| <i>Hukou</i> status (ref. Urban local)         |                                   |                       |                      |                       |
| Rural local                                    | −0.646 **<br>(0.257)              | 0.178 *<br>(0.107)    | −0.056<br>(0.431)    | −0.159 ***<br>(0.037) |
| Urban migrant                                  | 0.058<br>(0.224)                  | 0.277 *<br>(0.142)    | 0.483 *<br>(0.276)   | −0.129 **<br>(0.052)  |
| Rural migrant                                  | −0.697 **<br>(0.303)              | 0.671 ***<br>(0.120)  | −0.199<br>(0.378)    | −0.359 ***<br>(0.047) |
| Household size (ref. 1~2)                      |                                   |                       |                      |                       |
| 3~4                                            | 0.502 ***<br>(0.155)              | 0.311 ***<br>(0.097)  | 0.496 **<br>(0.241)  | 0.040<br>(0.030)      |
| ≥5                                             | 0.568 ***<br>(0.210)              | 0.337 ***<br>(0.130)  | 0.547 *<br>(0.321)   | 0.100 **<br>(0.042)   |
| Household income (ref. Lowest 20%)             |                                   |                       |                      |                       |
| 2nd 20%                                        | 0.540 **<br>(0.267)               | 0.270 **<br>(0.116)   | 0.608<br>(0.873)     | 0.137 ***<br>(0.037)  |
| 3rd 20%                                        | 0.704 ***<br>(0.259)              | 0.199 *<br>(0.119)    | 1.574 **<br>(0.760)  | 0.340 ***<br>(0.038)  |
| 4th 20%                                        | 1.177 ***<br>(0.251)              | 0.348 ***<br>(0.120)  | 2.143 ***<br>(0.738) | 0.543 ***<br>(0.040)  |
| Highest 20%                                    | 1.371 ***<br>(0.256)              | 0.658 ***<br>(0.123)  | 2.836 ***<br>(0.732) | 0.968 ***<br>(0.042)  |
| Housing acquisition year (ref. 1998–2007)      |                                   |                       |                      |                       |
| 2008–2012                                      | 0.918 ***<br>(0.137)              | 0.978 ***<br>(0.088)  | 1.011 ***<br>(0.232) | 0.033<br>(0.028)      |
| 2013–2017                                      | 1.775 ***<br>(0.147)              | 1.575 ***<br>(0.095)  | 1.663 ***<br>(0.241) | 0.005<br>(0.034)      |
| Region (ref. East)                             |                                   |                       |                      |                       |
| Central                                        | 0.055<br>(0.198)                  | 0.030<br>(0.127)      | −0.763<br>(0.475)    | −0.336 ***<br>(0.041) |
| West                                           | −0.093<br>(0.173)                 | 0.149<br>(0.106)      | −0.628 **<br>(0.315) | −0.659 ***<br>(0.036) |
| Northeast                                      | 0.227<br>(0.177)                  | −0.289 **<br>(0.118)  | −0.591<br>(0.371)    | −0.858 ***<br>(0.037) |
| Administrative level (ref. Prefectural cities) |                                   |                       |                      |                       |
| Municipalities                                 | −0.325<br>(0.337)                 | 0.208<br>(0.205)      | 1.083 *<br>(0.653)   | 0.787 ***<br>(0.069)  |
| Sub-provincial cities                          | −0.292<br>(0.300)                 | 0.388 **<br>(0.177)   | 0.735<br>(0.621)     | 0.527 ***<br>(0.060)  |
| Other capital cities                           | 0.018<br>(0.267)                  | 0.398 **<br>(0.159)   | 0.178<br>(0.621)     | 0.545 ***<br>(0.054)  |
| Development level (ref. Other cities)          |                                   |                       |                      |                       |
| First-tier cities                              | 0.424<br>(0.370)                  | 0.079<br>(0.226)      | 0.242<br>(0.711)     | 0.539 ***<br>(0.077)  |
| New first-tier cities                          | 0.692 **<br>(0.316)               | 0.434 **<br>(0.187)   | 0.337<br>(0.672)     | 0.076<br>(0.064)      |
| Second-tier cities                             | 0.171<br>(0.262)                  | 0.315 **<br>(0.158)   | −0.208<br>(0.603)    | 0.084<br>(0.053)      |

Table 2. Cont.

|                | Mortgage Use (Ref. Nonmortgagors) |                       |                       | Housing Wealth       |
|----------------|-----------------------------------|-----------------------|-----------------------|----------------------|
|                | HPF Loans                         | Commercial            | Combined              |                      |
| Content        | −4.596 ***<br>(0.489)             | −1.984 ***<br>(0.277) | −6.681 ***<br>(1.086) | 3.185 ***<br>(0.091) |
| Observations   |                                   |                       | 6437                  |                      |
| Log-likelihood |                                   |                       | −12,967.04            |                      |
| AIC            |                                   |                       | 26,182.08             |                      |
| BIC            |                                   |                       | 27,021.54             |                      |

Significance levels: \*  $p < 0.05$ ; \*\*  $p < 0.01$ ; \*\*\*  $p < 0.001$ . Standard errors are in parentheses.

Educational achievement and occupational status reflect human capital and repayment abilities. The results show that the probability of using HPF and combined loans increases with higher educational achievement. The probability of using commercial loans is significant only for those with college or vocational school degrees. This is because financial institutions view higher educational achievement as higher repayment potential and are more likely to approve such loan applications. Those with higher occupational status are more likely to use HPF and combined loans, but the probability of using commercial loans is not significant. This suggests that higher human capital helps homebuyers obtain funds from market-based and policy-based financing sources.

In terms of institutional factors, employer type and *hukou* status have significant impacts on the use of housing loans, while the influence of CCP membership is not significant. Those working in the public sector are more likely to use HPF and combined loans and are less likely to use commercial loans. As the earliest target group of the HPF program, public sector employees have been enjoying policy-based welfare [58]. They rarely use commercial loans alone and often preferentially use HPF loans with subsidized interest rates or combine them with commercial loans when necessary.

The type of *hukou* has a significant effect on the use of housing loans. The probability of rural *hukou* holders using HPF loans is low. Compared with local urban *hukou* holders, residents of the other three types of *hukou* are more likely to use commercial loans. The possible reasons for this phenomenon are as follows. First, the HPF program was originally designed to cover urban residents and was subsequently extended to migrants working in cities [41]. However, many rural residents and migrants do not have formal jobs with HPF accounts; thus, they are not eligible to apply for HPF loans. Second, compared to urban locals, migrants have weaker social networks locally and limited access to economic resources. Hence, obtaining resources from the mortgage market is one of their limited options. For urban migrants, in addition to making use of commercial mortgages, they are also more likely to combine them with HPF loans. Urban migrants are usually a selective group [59]. Only capable migrants stay in the cities and others may return to their hometowns. Those settled down usually are resourceful and could mobilize various sources to fund home purchases. Overall, a distinction between the types of loans reveals that institutional barriers to accessing market-based financing channels are low.

This study examines the effects of household size and income. In the CHFS, family members are defined as “those who share income and expenditure”; thus, the number of family members will also affect housing demand and housing consumption. Larger households are more likely to use housing loans, probably because they need more space and therefore need more money to purchase homes. Household income is a direct indicator of a household’s economic status. As household income increases, so does the probability of using various types of housing loans. However, when household income levels reach the top 40%, the probability of using HPF and combined loans increases substantially. This suggests that for households that can afford to use multiple loans together, combining them is the most popular choice, followed by the option of HPF loans with subsidized interest rates, and finally the costly commercial mortgage loans.

In examining the effect of the timing of housing acquisition, using the years 1998–2007 as a reference group, the results showed that households that purchase homes later are more likely to apply for housing loans. This may be because the rapid rise in the prices of homes since 2008 has made it necessary to use mortgages to finance their purchases. Compared with the eastern region, residents in the northeastern region are relatively less likely to use commercial loans, while those in the western region are less likely to use combined loans. Compared with ordinary prefectural cities, residents in municipalities have a higher probability of using combined loans, while those in sub-provincial cities and other capital cities have a higher probability of using commercial loans. Lastly, residents in new first-tier cities have a higher probability of using HPF and commercial loans, while those in second-tier cities have a higher probability of using commercial loans. This suggests that in places where housing costs are higher, it is often necessary to combine multiple financing channels to meet high fund needs [60].

The fifth column of Table 2 shows the factors that directly influence housing wealth. Market factors have a significant impact on household housing wealth. As education increases, more housing wealth is accumulated, with the effect of possession of a bachelor's degree and above being 2.3 times higher than that of junior high school or below. The higher occupational status of household heads did not directly increase housing wealth, while households with higher incomes are more likely to accumulate housing wealth. The large coefficient difference between different income groups also reflects the “superposition effect” of income and housing wealth to a certain extent. This means that high-income households own more property and accumulate more housing wealth, while low-income households fall behind in the housing boom.

In terms of institutional factors, the direct impact of working in the public sector and CCP membership on housing wealth is not significant. Compared with local urban residents, residents of the other three *hukou* statuses have less housing wealth. Among them, the housing wealth of urban migrants is the largest, followed by local rural *hukou* holders, and rural migrants are the most disadvantaged type of *hukou* holders.

Compared to the eastern region, residents in other regions have less housing wealth. Housing wealth shows a gradient pattern with administrative rank. The order of housing wealth from highest to lowest is as follows: municipalities, provincial capitals, sub-provincial cities, and prefecture-level cities. Among the different tiers of cities, living in first-tier cities is the most beneficial for housing wealth accumulation, while the effect of new first-tier and second-tier cities is not significant. Housing wealth is closely related to a city's geographic location and political and economic levels. The geographical advantage of being located in the eastern region, municipalities, or first-tier cities makes it easier for households to accumulate housing wealth, but this also widens the spatial inequality of housing wealth.

Table 3 shows the indirect impact of individual, household, and city attributes on housing wealth accumulation through the use of housing loans. The results show that institutional and market-based factors play different roles across loan types. Among the market-based factors, those with college and higher education and higher occupational status accumulate housing wealth indirectly through the use of housing loans. Moreover, with the increase in household income, the indirect impact of housing loans on promoting housing wealth accumulation is greater. Households with higher incomes are more likely to use combined loans and borrow more money to enter the housing market.

In terms of institutional factors, residents working in the public sector increase their housing wealth through the use of HPF and combined loans, but the use of commercial loans is not conducive to the accumulation of housing wealth. Migrants are more likely to accumulate housing wealth through commercial mortgage loans, while rural *hukou* holders have difficulty accumulating housing wealth through HPF loans. The results show that groups with institutional advantages not only have easier access to lower-cost, policy-based financing but also further expand their advantage in accumulating housing wealth.

In terms of regional differences, the indirect impact on the housing wealth of residents in the western region through combined loans is negative. This may be due to the fact that housing prices are lower in the western region, and homebuyers do not have high financial needs. Only residents in municipalities and provincial capitals have a significant positive impact on housing wealth accumulation through commercial loans. Regarding the urban development level, residents in new first-tier cities are more likely to increase their housing wealth by using HPF and commercial loans.

**Table 3.** Indirect effects of housing loan as a mediator on housing wealth.

|                                                | Via Mortgage Use (Ref. Nonmortgagors) |                                |                              |
|------------------------------------------------|---------------------------------------|--------------------------------|------------------------------|
|                                                | HPF Loans →<br>Housing Wealth         | Commercial →<br>Housing Wealth | Combined →<br>Housing Wealth |
| Education (ref. Junior school and below)       |                                       |                                |                              |
| High school                                    | 0.059                                 | 0.040                          | 0.334 *                      |
| College/vocational school                      | 0.104 **                              | 0.063 *                        | 0.432 **                     |
| Bachelor's degree and above                    | 0.117 **                              | 0.057                          | 0.492 **                     |
| High occupation status                         | 0.052 **                              | 0.017                          | 0.119 *                      |
| Working in the public sector                   | 0.152 ***                             | −0.081 ***                     | 0.147 **                     |
| CCP membership                                 | 0.001                                 | 0.002                          | 0.095                        |
| Hukou status (ref. Urban local)                |                                       |                                |                              |
| Rural local                                    | −0.096 *                              | 0.050                          | −0.018                       |
| Urban migrant                                  | 0.009                                 | 0.077 *                        | 0.160                        |
| Rural migrant                                  | −0.103 *                              | 0.187 ***                      | −0.066                       |
| Household income (ref. Lowest 20%)             |                                       |                                |                              |
| 2nd 20%                                        | 0.080 *                               | 0.075 **                       | 0.201                        |
| 3rd 20%                                        | 0.104 **                              | 0.055                          | 0.521 *                      |
| 4th 20%                                        | 0.174 **                              | 0.097 ***                      | 0.710 **                     |
| Highest 20%                                    | 0.203 ***                             | 0.183 ***                      | 0.939 ***                    |
| Region (ref. East)                             |                                       |                                |                              |
| Central                                        | 0.008                                 | 0.008                          | −0.253                       |
| West                                           | −0.014                                | 0.042                          | −0.208 *                     |
| Northeast                                      | 0.034                                 | −0.080 **                      | −0.196                       |
| Administrative level (ref. Prefectural cities) |                                       |                                |                              |
| Municipalities                                 | −0.048                                | 0.058                          | 0.359                        |
| Sub-provincial cities                          | −0.043                                | 0.108 **                       | 0.243                        |
| Other capital cities                           | 0.003                                 | 0.111 **                       | 0.059                        |
| Development level (ref. Other cities)          |                                       |                                |                              |
| First-tier cities                              | 0.063                                 | 0.022                          | 0.080                        |
| New first-tier cities                          | 0.102 *                               | 0.121 **                       | 0.112                        |
| Second-tier cities                             | 0.025                                 | 0.088 *                        | −0.069                       |

Significance levels: \*  $p < 0.05$ ; \*\*  $p < 0.01$ ; \*\*\*  $p < 0.001$ . Standard errors are in parentheses.

## 5. Conclusions

The social norms of homeownership and the booming housing market have made housing an important component of household wealth in urban China. In this process, the role of the establishment and improvement of the housing finance system in facilitating the expansion of the owner-occupation sector is witnessed. Existing studies have found that housing wealth is increasingly differentiated across individuals, but few studies have focused on whether and how the use of housing loans affects housing wealth accumulation. This study examines how resources and constraints of individuals, households, and cities influence housing wealth differentiation through housing loans, and how the effects of market and policy-based housing finance channels differ.

Based on the CHFS 2017 data, the study found that the market has become the dominant mechanism for shaping housing wealth inequality, which to some extent supports

the “market transformation theory” [61]. Empirical analysis shows that market factors, such as economic resources (family income), human capital (educational achievement), and occupational status play an important role in the accumulation of family housing wealth. These factors are also the focus of financial institutions in the process of housing loans application. Through the use of housing loans, this group is more likely to accumulate housing wealth. In addition, this group tends to finance home purchases from multiple sources because of their educational achievement and formal employment, thereby more effectively leveraging their financial resources.

Contrary to the “power persistence theory” [62], working in the public sector and being a party member did not have a significant direct impact on household housing wealth. However, dominant groups can use policy-based financial instruments to accumulate housing wealth through their advantages. Although political power does not directly interfere with the allocation of housing resources in transitional China, it can still influence housing wealth through its characterized potential affordability. *Hukou*, as a product of the dual rural–urban system in China, has profound impacts, not only on access to housing, but also on the access to housing finance. Rural households are still in a disadvantaged position in housing wealth accumulation and rely more on commercial mortgage loans to fund home purchases.

## 6. Discussion

This study investigates the use of housing loans and their impact on housing wealth inequality in urban China. The findings revealed that the usage of housing loans exerts a mediator role in affecting households’ housing wealth accumulation. Overall, those who are disadvantaged in terms of institutional status tend to rely on more costly market-based financing channels to finance home purchases, while groups with social and economic advantages can jointly use both policy and market-based financing channels, which further amplifies the divergence of household housing wealth.

In this era of increasing financialization, the reliance on financial instruments in the process of asset accumulation may further widen the existing inequalities between social classes. This study implies that the housing finance system needs to be refined to raise homebuyers’ purchasing power and at the same time ensure equity for different social groups. In particular, it should be noted that the HPF loans benefit the advantaged group, which contradicts its original intention. It is suggested to expand the coverage of the HPF scheme, especially to employees in private enterprises and the informal sector, which allows for the possibility of using subsidized HPF loans among low-income groups. Furthermore, the precondition of applying for HPF loans can be set up. For instance, only those who do not own a home could apply for HPF loans. Various policies can be designed to prevent subsidized financial instruments from serving as a vehicle of asset accumulation.

There are several limitations of this study. First, the amount of housing value was self-reported by the respondents, among which some were overestimated, while others were underestimated. Second, we only know from the survey whether the respondents made use of mortgages (commercial, HPF, or combined), but we do not know the amount of the loan. Thus, the differences between borrowers with different amounts of loans cannot be measured in this study. Third, we only focus on the formal types of housing mortgages (commercial and HPF mortgages) in this study. However, there are other informal types of financial instruments to fund home purchases, for instance, private lending and consumer loans, the impact of which cannot be examined in this study. In the future, we hope to obtain more detailed data regarding households’ housing wealth and how they purchased their home, based on which we could more precisely assess the impact of the usage of housing finance on housing wealth inequality. Furthermore, in addition to current housing wealth, it could be interesting to look into property appreciation that people gain by mobilizing various financial instruments.

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## Notes

- <sup>1</sup> *Hukou* status is an official record of where a household is registered. The division between urban (nonagricultural) and rural (agricultural) *hukou* is fundamental, mainly because the land, housing, and labor markets are segmented between urban and rural areas. The distinction between local and migrant is based on whether the registered *hukou* is the same as the current residence.
- <sup>2</sup> The financial news portal Yicai.com has been publishing the rankings of China's new first-tier cities since 2013, which has been widely discussed in China and gradually gained recognition. Criteria include the cities' business resources, potential to function as a hub, resident activity, lifestyle diversity, and future adaptability.
- <sup>3</sup> The spatial distribution of house prices is uneven in urban China. For example, in 2017, the average sales price of commodity housing was 24,866 yuan/m<sup>2</sup> in Shanghai (eastern, municipality, first-tier city), 7280 yuan/m<sup>2</sup> in Changsha (central, other provincial capital, new first-tier city), and 3611 yuan/m<sup>2</sup> in Ordos (western, prefecture-level, other cities).

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