Research on the causes of regional differences in urban residential land incremental value based on shapley value decomposition framework

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Abstract. This paper studied the formation mechanism of the differences of land incremental value among various regions by using the Shapley value decomposition framework. It was the first time to introduce inequality indexes to measure the differences in land incremental value in various regions, then a semi-logarithmic regression equation were constructed to determine the influencing factors, and finally the contribution of each factor was measured through the Shapley value decomposition model. The results indicated that: the regional inherent differences between cities and the differences in the residential land price per land area have a stable and strong impact on the differences in urban residential land value increment; the differences in completion value of residential buildings have a certain contribution on the expansion of regional differences in urban residential land incremental value, but they fluctuate greatly; the contribution of the differences of housing investment demand to the differences of urban residential land incremental value has gradually increased.

1. Introduction

With the opening of China's real estate market in 1998, the differentiation of real estate market among different cities leads to the increasing differences of the land value increment from the primary market to the secondary market in different cities, which brings great difficulties for the government to formulate macro-control policies. Therefore, it is of great theoretical and practical significance to study the formation mechanism of regional differences in land incremental value.

From the existing literature, there are three main types of research on regional differences in the land value increment. The first type of scholars explained the causes of regional differences of urban land incremental value from the differences of land value increment types and land rent capitalization [1-2]. The second type of scholars used econometric statistical models to attribute the regional differences of urban land incremental value in China to the different influencing factors of land value increment. This kind of scholars can be divided into two categories: Some scholars used the hedonic price models to analyze the influence of land ownership on the regional differences of land incremental value from macro and micro level [3-4]. Other scholars used geographical weighted regression model (GWR) and spatiotemporal geographical weighted statistical regression analysis model (GTWR) to analyze the impact of macro and micro factors on regional differences of land
incremental value [5-6]. From the perspective of multiple subjects, the third type of scholars attributed the regional differences of land incremental value to the differences of regional subjects and their behaviors [7-8]. Based on the multi-subject perspective to study the causes of regional differences in the land incremental value, compared with other studies, it can inherit the main advantages of analyzing the causes of regional differences in land incremental value based on the nature of the land value increment, and overcome the differences caused by the ambiguous nature of the land value increment.

Through the above-mentioned literature review, this paper had perfected and improved the shortcomings of the existing literature on two fronts. First, it is easy to ignore the continuity of land value increment and the differences of influencing factors in the real estate market at all levels. Therefore, the development process of real estate primary market to secondary market is considered as a whole, and the identification of interest subjects’ behaviors were expanded in this paper. Second, existing studies lacked the measurement and cause analysis of regional differences in urban land incremental value. Therefore, the inequality index was introduced to measure the regional differences of urban residential land incremental value, and the regional differences of urban residential land incremental value were decomposed through the Shapley value decomposition framework based on semi-logarithmic regression equation, so as to study the contribution and trend of each subject's behaviors to the regional differences of urban residential land incremental value.

2. Methods

2.1. Sample and data
This paper selected the panel data of 35 large and medium-sized cities in China from 2006 to 2018 as the research sample. The data came from the China Real Estate Statistical Yearbook, China City Statistical Yearbook, China Statistical Yearbook, municipal statistical yearbooks at various levels, public information of the People's Bank of China, CREIS database, and Shanghai E-House Real Estate Research Institute. The statistical and data processing softwares used in this paper were Stata 15.0 and performs Shapley value decomposition through the DASP toolkit.

2.2. Dependent variable
The average construction period was assumed as 2 years (year t to year t-2 were defined as a construction cycle, 2008≤t≤2018, and each construction cycle was marked as by the year at the end of the construction cycle)[9]. And the LIVi, t was used to express the land incremental value of urban residential land. According to the research of Shao Xinjian et al.[10], the price of commercial housing can be divided into the price of buildings on the ground and the price of land. Therefore, the method of he Weida et al. was refered to calculate the housing cost [11]:

\[
\text{Housing completion cost}_{ij} = \frac{\text{Land purchase fee}_{i,t-2} + \text{Land development investment}_{i,t-2}}{\text{Plot rate}_{i,j}} + \text{Housing completion value}_{i,j}
\]

And the average incremental value of land in the construction period t is expressed as:

\[
\text{LIV}_{ij} = \left(\frac{\text{Housing price}_{i,t} - \text{Housing completion cost}_{i,j}}{\text{Land purchase fee}_{i,t-2}}\right) \times \text{Plot rate}_{i,j} + 1
\]

2.3. Independent variable
The independent variables are shown in Table 1:
| Subject                        | Behavior                                                                 | Measurement index                                                                 | Calculation method                                                                 |
|-------------------------------|--------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| The central government        | Formulate fiscal and taxation policies and real estate related policies  |Dummy variables of construction cycle (γt)                                         | Time dummy                                                                         |
|                               | Supply construction land                                                 | Growth rate of residential land launch area (LSi,t)                               | Residential land launch area<sub>i</sub>, Residential land launch area<sub>i-2</sub> |
| The local governments         | Rely on Land Finance                                                     | Difference value of local government's dependence on land finance (LGIi,t)        | Land transfer fees<sub>i</sub>, Local government budget revenue<sub>i</sub>, Local government budget revenue<sub>i-2</sub> |
|                               | Adjuste plot ratio                                                      | Difference value of plot ratio (FARi,t)                                           | Land price per land area<sub>i</sub>, Land price per land area<sub>i-2</sub>, Land price per floor area<sub>i</sub>, Land price per floor area<sub>i-2</sub> |
| Developers                    | Obtain the right to use land for residential construction               | Growth rate of land price per land area (LPi,t)                                   | land price per land area<sub>i</sub>, land price per land area<sub>i-2</sub>         |
|                               | Investment and construction                                             | Growth rate of housing completion value (HCVi,t)                                  | Housing completion value<sub>i</sub>, Housing completion value<sub>i-2</sub>          |
|                               | Pricing house and selling house                                          | Growth rate of housing price (HPi,t)                                              | Housing price<sub>i</sub>, Housing price<sub>i-2</sub>                                |
| Home buyers                   | Rigid demand                                                             | Growth rate of home buyers’ rigid demand (HRDIi,t)                               | permanent resident population<sub>i</sub>− registered population<sub>i</sub>, permanent resident population<sub>i-2</sub>− registered population<sub>i-2</sub> |
|                               | Investment demand                                                       | Difference value of home buyers’ investment demand (HPIRIi,t)                   | housing price to income ratio<sub>i</sub>, housing price to income ratio<sub>i-2</sub> |
| Financial institutions        | Credit aid                                                              | Difference value of credit support (TLi,t)                                       | Financial institutions loan balance<sub>i</sub>, Financial institutions loan balance<sub>i-2</sub> |
| Other macro variables         | Measure the economic development level of each city                      | Growth rate of urban GDP per capita (GDPi,t)                                     | Urban GDP per capita<sub>i</sub>, Urban GDP per capita<sub>i-2</sub>                   |
Measure the living standards of urban residents

Growth rate of urban residents per capita disposable income (PDI_{i,t})

\[
\left( \frac{\text{Urban residents per capita disposable income}_{i,t+1}}{\text{Urban residents per capita disposable income}_{i,t}} \right) - 1
\]

2.4. Analytical method

2.4.1. Measure of regional differences. At present, there is no specific indicator to measure the regional differences of urban residential land incremental value, but many studies introduced statistical indicators reflecting income inequality to measure regional differences [12]. Based on the complementarity of the sensitive intervals of each inequality index, Gini index (Gini), Logarithmic mean deviation (GE0) and Theil index (GE1) were introduced to comprehensively measure the regional differences of urban residential land incremental value.

Gini index (Gini): Gini is sensitive to the change of middle level and the expression is:

\[
Gini = \frac{1}{2k^2\mu} \sum_{i=1}^{k} \sum_{j=1}^{k} |Z_i - Z_j| \tag{3}
\]

Logarithmic mean deviation (GE0): GE0 is sensitive to the change of bottom level and the expression is:

\[
GE_0 = \sum_{j=1}^{k} f_j \ln \frac{\mu}{Z_j} \tag{4}
\]

Theil index (GE1): GE1 is sensitive to the change of the upper level and the expression is:

\[
GE_1 = \sum_{j=1}^{k} f_j \frac{Z_j}{\mu} \ln \frac{Z_j}{\mu} \tag{5}
\]

k represents the sample size, Z_i and Z_j are the incremental value of residential land of the ith and jth samples respectively, \(\mu\) represents the average incremental value of residential land, f_j represents the weight, a is a constant, representing the degree of aversion to inequality, the smaller the a, the higher the aversion.

2.4.2. Shapley value decomposition framework. The Shapley value decomposition framework of the regression equation based on inequality index is a new method proposed by Shorrocks on the basis of cooperative game theory to study the contribution rate of each influencing factor to the overall differences [13]. And Wan Guanghua proposed a method to eliminate the influence of constant terms and calculate the residual contribution, supplementing and perfecting the decomposition framework [14]. Compared with the hedonic price model, GWR model and GTWR model, this decomposition framework can better measure the degree of influence of explanatory variables on the overall level of the explained variables.

This paper referred to Shorrocks to make the following settings [13]: The variable set \(K=\{x_1,x_2,...,x_k\}\) is grouped by the elements to obtain the set \(PK\), \(k\) is the number of elements in the set \(K\), which is the number of subject behaviors in this article. Let \(N\) be a subset of \(K\), \(N \subseteq K\), and \(n\) is the number of elements in the set \(N\). The set \(\{N/x_i\}\) represents the set formed after removing the influence of \(x_i\) in the set \(N\), that is, the mean value of \(x_i\) is taken, and other variables are the actual value. I represents the inequality index, and \(I(N)\) represents the differences caused by the elements in the set \(N\). \(\varphi_i\) represents the contribution of the variable \(x_i\) and the expression is:

\[
\varphi_i = \frac{\sum_{N \subseteq K} \frac{(n-1)(k-n)}{k!} \left[ I(N) - I(N/x_i) \right]}{I(N)} , i = 1, 2, ..., k \tag{6}
\]
(n-1)!/(k-n)! represents the weighting factor of the regional differences of urban residential land incremental value caused by the combination of different subjects' behaviors. \([I(N)-I(N/x_i)]\) represents the marginal contribution of subject behavior \(x_i\) to the regional differences of urban residential land incremental value in each subject behavior combination. \(\phi_i/I(N)\) represents the contribution of subject behavior \(x_i\) to the regional differences of urban residential land incremental value.

2.5. Models

First, a regression model was constructed in semi-logarithmic form. Because the F likelihood ratio test rejected the null hypothesis that the mixed model (OLS) should be used. And the Hausman test rejected the null hypothesis that the random effects model (RE) should be used, so a fixed effects model (FE) was established for estimation. The semi-logarithmic regression model is as follows:

\[
\ln LIV_{it} = \beta_0 + \beta_1 GDP_{it} + \beta_2 PCDI_{it} + \beta_3 LS_{it} + \beta_4 FAR_{it} + \beta_5 LGI_{it} + \beta_6 LP_{it} + \beta_7 HP_{it} + \beta_8 HCV_{it} + \beta_9 HRD_{it} + \beta_{10} HPIR_{it} + \beta_{11} TL_{it} + \mu_i + \gamma_t + \epsilon_{it}
\]  

Then, exponential transformation on both sides of the equal sign was performed to obtain the decomposition frame of the model to be decomposed. Since the constant term is exponentially transformed, it will not affect the regional differences in the urban residential land incremental value. The model to be decomposed is as follows:

\[
LIV_{it} = \exp(\beta_0) \times \exp(\beta_1 GDP_{it}) \times \exp(\beta_2 PCDI_{it}) \times \exp(\beta_3 LS_{it}) \times \exp(\beta_4 FAR_{it}) \times \exp(\beta_5 LGI_{it}) \times \exp(\beta_6 LP_{it}) \times \exp(\beta_7 HP_{it}) \times \exp(\beta_8 HCV_{it}) \times \exp(\beta_9 HRD_{it}) \times \exp(\beta_{10} HPIR_{it}) \times \exp(\beta_{11} TL_{it}) \times \exp(\mu_i) \times \exp(\gamma_t) \times \exp(\epsilon_{it})
\]  

\(i\) represents each city, \(t\) represents each year and \(2008 \leq t \leq 2018\), \(\beta_0\) represents a constant term, \(\beta_1, \beta_2, \ldots, \beta_{11}\) represent estimated coefficients, \(\mu_i\) represents the City fixed effects, \(\gamma_t\) represents time fixed effects, \(\epsilon_{it}\) represents the residual.

3. Results and discussion

3.1. Analysis on regional differences of land incremental value

The analysis results inequality indices were shown in Table 2 and the trends were shown in Figure 1:

| \(t\)  | Gini | GE0  | GE1  |
|------|------|------|------|
| 2008 | 0.2665 | 0.1245 | 0.1236 |
| 2009 | 0.3256 | 0.1759 | 0.1909 |
| 2010 | 0.2859 | 0.1376 | 0.1310 |
| 2011 | 0.3437 | 0.2082 | 0.2602 |
| 2012 | 0.2604 | 0.1089 | 0.1168 |
| 2013 | 0.2122 | 0.0738 | 0.0800 |
| 2014 | 0.3410 | 0.1944 | 0.2484 |
| 2015 | 0.2938 | 0.1456 | 0.1402 |
| 2016 | 0.2658 | 0.1134 | 0.1263 |
| 2017 | 0.2124 | 0.0732 | 0.0756 |
| 2018 | 0.2931 | 0.1398 | 0.1334 |
Figure 1. Trend of regional differences in urban residential land incremental value.

It can be seen from Table 2 and Figure 1 that the three inequality indicators show a basically consistent change process, indicating that these three indicators are consistent in measuring the regional differences in urban residential land incremental value.

3.2. Semi-logarithmic equation regression results

This paper also performed intra-group autocorrelation test, between-group heteroscedasticity test, and cross-sectional correlation test on the model. The results showed that the model does not have intra-group autocorrelation problems, but there were problems of heteroscedasticity between groups and may have cross-sectional correlation problems. Therefore, the Driscoll-Kraay standard error correction fixed effects model (FE/SCC) was used to estimate the model [15]. The results were shown in Table 3:

| Table 3. Semi-logarithmic regression models estimation results. |
|---------------------------------------------------------------|
| **OLS** | **Model 2** | **Model 3** |
| **GDP** | 0.1436* | 0.1310 | 0.1310 |
| | (0.0732) | (0.0800) | (0.0802) |
| **PCDI** | 0.2448 | 0.0410 | 0.0410 |
| | (0.3623) | (0.3507) | (0.1850) |
| **LS** | -0.0190 | -0.0477*** | -0.0477* |
| | (0.0212) | (0.0179) | (0.0223) |
| **FAR** | -0.1916*** | -0.1948*** | -0.1948*** |
| | (0.0604) | (0.0360) | (0.0447) |
| **LGI** | 0.0385 | 0.1229** | 0.1229** |
| | (0.0668) | (0.0534) | (0.0448) |
| **LP** | 0.2068*** | 0.1932*** | 0.1932*** |
| | (0.0329) | (0.0392) | (0.0249) |
| **HP** | 0.5559*** | 0.8779*** | 0.8779*** |
| | (0.1893) | (0.1446) | (0.0843) |
| **HCV** | -0.6333*** | -0.6133*** | -0.6133*** |
| | (0.0945) | (0.0740) | (0.0641) |
| **HRD** | 0.0331** | 0.0210** | 0.0210*** |
| | (0.0134) | (0.0099) | (0.0036) |
| **HPIR** | -0.0386*** | -0.0275 | -0.0275** |
| | (0.0133) | (0.0219) | (0.0093) |
| **TL** | 0.1844* | 0.1490 | 0.1490** |
| | (0.0941) | (0.0977) | (0.0632) |
| **Constant** | 0.7710*** | 0.5789*** | 0.7532*** |
| | (0.0713) | (0.1332) | (0.0833) |

City fixed effects? No Yes Yes
Model 1, 2 and 3 in Table 3 were the mixed regression results, random effect model regression results and fixed effect model regression results of 35 large and medium-sized cities in China. The estimation results in Model 3 indicated that: The increase of residential land launch area(LSi,t), plot ratio(FARI,t), housing completion value(HCVi,t), home buyers’ investment demand(HPIRi,t) will inhibit urban residential land increment. However, the increase of local government's dependence on land finance (LGIi,t), land price per land area(LPi,t), housing price(HPi,t), home buyers’ rigid demand(HRDi,t), credit support(TLi,t) will promote urban residential land increment.

### 3.3. Shapley value decomposition results

Since the growth rate of per capita GDP (GDPi,t) and the growth rate of urban residents per capita disposable income (PCDLi,t) were not significant in the semi-logarithmic regression model, these two variables from the equation to be decomposed were removed. And \( \beta_0 \) and \( \gamma_t \) of each construction period in the model are constants, therefore, they were not affect the decomposition results. The model to be decomposed was built based on the regression results of Model 3. The decomposing results were shown in Table 4 and Table 5:

#### Table 4. Contributions of behaviors to the regional differences in land incremental value (1).

| t     | LS  | FAR | LGI | LP  | HP  |
|-------|-----|-----|-----|-----|-----|
|       | Contributi on % | Sorting | Contributi on % | Sorting | Contributi on % | Sorting | Contributi on % | Sorting | Contributi on % | Sorting |
| 2008  | 2.53 | 5    | 2.55 | 4    | 0.41 | 6    | 20.06 | 2    | 0.36 | 7    |
| 2009  | -0.26 | 8    | 0.90 | 7    | 2.71 | 5    | 20.68 | 2    | 9.76 | 3    |
| 2010  | -1.77 | 9    | 5.27 | 4    | -0.23 | 7    | 10.76 | 3    | 11.32 | 2    |
| 2011  | 1.86 | 6    | -4.35 | 10    | 2.92 | 5    | 15.87 | 2    | 5.05 | 4    |
| 2012  | 2.39 | 6    | -2.63 | 10    | 2.41 | 5    | 7.90 | 2    | 7.24 | 3    |
| 2013  | -4.93 | 9    | 2.09 | 4    | 0.66 | 6    | 6.40 | 2    | 1.92 | 5    |
| 2014  | -1.33 | 9    | 2.74 | 4    | 1.61 | 7    | 8.22 | 2    | 1.84 | 6    |
| 2015  | 1.18 | 9    | 1.72 | 5    | 1.68 | 6    | 9.25 | 3    | 2.57 | 4    |
| 2016  | 1.18 | 5    | -1.71 | 8    | 0.37 | 6    | 22.28 | 2    | -6.07 | 10   |
| 2017  | 0.21 | 8    | -0.48 | 9    | 1.10 | 6    | 36.46 | 2    | -1.72 | 10   |
| 2018  | -2.05 | 10   | 2.31 | 7    | 4.11 | 6    | 16.64 | 2    | 14.76 | 3    |
| Mean  | -0.09 | 10   | 0.76 | 7    | 1.61 | 5    | 15.87 | 2    | 4.27 | 4    |

NOTE: Robust standard errors in parentheses, ***p<0.01, **p<0.05, *p<0.1.
differences in urban residential land incremental value had gradually changed from the initial differences in home buyers' investment demand differences (HPIRi,t) on the expansion of regional expansion of the regional differences in urban residential land incremental value. The impact of the Residential land launch area differences (LSi,t), local government's dependence on land finance inhibitory effect to the promoting effect, and the ranking of contributions had gradually risen. Price per land area differences (LPi,t) was basically in the top three, indicating that the regional formation of regional differences in urban residential land incremental value. The ranking of the land first, which once again showed that inherent differences between cities are an important reason for the transaction price differences of urban residential land has always been an important reason for the differences in urban residential land incremental value.

It is worth noting that the contribution of land price per land area differences (LPi,t) and housing completion value policy preference can greatly affect the regional differences of urban residential land incremental value. Among cities due to regional resource endowment, lag effect of historical development and long-term inherent differences (μi) ranked first (42.32%) during the review period, indicating that the differences among cities due to regional resource endowment, lag effect of historical development and long-term policy preference can greatly affect the regional differences of urban residential land incremental value. The contribution of land price per land area differences (LPi,t) and housing completion value differences (HCVi,t) ranked the second (15.87%) and the third (4.84%) respectively, which indicated that the behaviors differences of developers in land purchasing and house building among different cities also contribute to the expansion of regional differences of urban residential land incremental value. However, other subjects’ behaviors had limited driving effect on the expansion of regional differences in urban residential land incremental value. It is worth noting that the contribution of residential land launch area differences (LSi,t) is negative (-0.09%), indicating that the differences in urban government land supply in general has an inhibitory effect on the expansion of the regional differences in urban residential land incremental value.

Second, from the perspective of time, the inherent differences (μi) of cities has always been ranked first, which once again showed that inherent differences between cities are an important reason for the formation of regional differences in urban residential land incremental value. The ranking of the land price per land area differences (LPi,t) was basically in the top three, indicating that the regional transaction price differences of urban residential land has always been an important reason for the expansion of the regional differences in urban residential land incremental value. The impact of the differences in home buyers’ investment demand differences (HPIRi,t) on the expansion of regional differences in urban residential land incremental value had gradually changed from the initial inhibitory effect to the promoting effect, and the ranking of contributions had gradually risen. Residential land launch area differences (LSi,t), local government's dependence on land finance differences (LGIIi,t), home buyers’ rigid demand differences (HRDIi,t) contributed to rankings

Table 5. Contributions of behaviors on the regional differences in land incremental value (2).  

| t    | HCV | HRD | HPIR | TL | μi | εi,t |
|------|-----|-----|------|----|----|------|
| 2008 | 8.20| 0.13| 0.06 | 0.06| 26.81| 1    |
| 2009 | 5.16| 2.45| -2.32| -0.35| 32.79| 1    |
| 2010 | 2.30| -0.82| -1.84| 1.56| 34.83| 1    |
| 2011 | 5.98| 1.42| -0.28| 0.75| 39.95| 1    |
| 2012 | 4.01| -0.07| -1.61| 1.47| 48.95| 1    |
| 2013 | -5.79| -0.01| -2.21| 2.17| 68.46| 1    |
| 2014 | 7.30| 0.07| -1.83| 2.25| 38.33| 1    |
| 2015 | 10.27| -0.01| 1.20| 1.36| 42.81| 1    |
| 2016 | -3.57| -0.12| 4.74| 2.28| 46.36| 1    |
| 2017 | 11.57| 0.34| 7.26| 4.74| 53.50| 1    |
| 2018 | 7.85| 0.31| 4.31| 0.91| 32.77| 1    |
| Mean | 4.84| 0.34| 0.68| 1.52| 42.32| 1    |

Note: Contribution is calculated as the average of the variable contribution rates measured by Gini, GE0, and GE1, and sorted by the average of the 3 indicators.

Referring to the method of Yu Wei and other scholars (2015), in this paper, we took the absolute value of the residual contribution of the model and calculate the explanatory power. The results showed that the average explanatory power of subjects’ behaviors in the decomposition models to the regional differences of urban residential land incremental value is 69.77%, the interpretation power of all models fitted values is also above 59.21%, it showed that the subjects’ behaviors has a good explanatory power for the regional differences in the urban residential land incremental value. Then we excluded the influence of residual and rank the contribution of each subject's behaviors. The results of contribution and ranking of each subject's behaviors in Table 4 and Table 5 revealed several key findings. First, From the perspective of average contribution and ranking, the contribution of the city's inherent differences (μi) ranked first (42.32%) during the review period, indicating that the differences among cities due to regional resource endowment, lag effect of historical development and long-term policy preference can greatly affect the regional differences of urban residential land incremental value. The contribution of land price per land area differences (LPi,t) and housing completion value differences (HCVi,t) ranked the second (15.87%) and the third (4.84%) respectively, which indicated that the behaviors differences of developers in land purchasing and house building among different cities also contribute to the expansion of regional differences of urban residential land incremental value. However, other subjects’ behaviors had limited driving effect on the expansion of regional differences in urban residential land incremental value. It is worth noting that the contribution of residential land launch area differences (LSi,t) is negative (-0.09%), indicating that the differences in urban government land supply in general has an inhibitory effect on the expansion of the regional differences in urban residential land incremental value.
although fluctuating but basically backward and relatively stable. The ranking of other subjects' behaviors contribution was unstable and fluctuates greatly.

4. Conclusions

Based on the Shapley Value Decomposition Framework, this paper analyzed the contribution of each subject's behavior on the regional differences of urban residential land incremental value. The results showed that: first, the increase of residential land launch area, plot ratio, housing completion value, home buyers’ investment demand can inhibit urban residential land increment. The increase of local government's dependence on land finance, land price per land area, housing price, home buyers’ rigid demand, credit support can promote urban residential land increment. Secondly, The regional inherent differences and the differences of the land price per land area would cause the regional differences of urban residential land incremental value; the housing completion value differences has a certain impact on the expansion of the regional differences in urban residential land incremental value, but they fluctuate greatly; the home buyers’ investment demand differences has gradually changed from the regional differences which initially could inhibit the urban residential land incremental value to promoting the differences, and its contribution ranking has gradually increased.

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