Visualization Research on China's Housing Purchase Restriction Policy System--Taking Beijing as an Example

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Abstract. The housing purchase restriction policy is an important part of China’s real estate macro-control policy, and its policy objective is to curb the excessive rise of real estate prices. Starting from the Chinese housing purchase restriction policy, this paper combines the content analysis method and the common word analysis method to quantitatively analyze the control policies to curb the “real estate speculation phenomenon”, and sort out the control policy system structure of China’s housing prices to improve the existing government. The control policy system and the introduction of restrictions on purchase policies in other regions provide guidance.

1. Introduction
Since the monetization reform of China’s housing system, China's real estate industry has experienced rapid growth in sales volume and investment volume. The problem of high fever in the real estate market has become more and more prominent. The problem of excessive growth in real estate prices has aroused widespread concern from the government and the public. In order to effectively curb the rapid rise in housing prices, the central government adopted a series of policy measures to regulate real estate, and the “housing purchase restriction policy” became one of the most powerful policy tools to curb real estate price increases. As of 2016, in addition to Beijing, Shanghai, Guangzhou, Shenzhen, and Sanya, five cities have implemented housing purchase restriction policies, and other cities have announced the cancellation of this policy[1]. However, as of 2019, there are still 22 cities across the country that implement the housing purchase restriction policy, which indicates that the real estate price increase in recent years is still not optimistic, which has caused many cities to continue to adopt the housing purchase restriction policy to resist the rising trend of real estate prices[2]. As the housing problem in China has become more prominent, scholars have gradually begun to pay attention to the implementation and effect of housing control policies, but the existing research is based on qualitative research and empirical judgment [3]. The research on the regionalization of real estate management and control policies is not deep enough to provide more effective suggestions for improving the current phenomenon.

Starting from the Chinese housing purchase restriction policy, this paper combines the content analysis method and the common word analysis method to quantitatively analyze the control policies to curb the “real estate speculation phenomenon”, and sort out the control policy system structure of China's housing price control. There are control policies and other regions that have introduced regional restrictions on the purchase of products to provide guidance.
2. Data foundation and analysis methods

2.1. Data source and sample selection
First of all, on the websites of the national government, the National Development and Reform Commission and other authoritative departments, relying on the public websites such as Xinhua Net and China.com to search for the relevant policies of housing purchase restriction with the words “housing”, “restricted purchase”, “policy” and “housing purchase restriction”. Secondly, using the relevant words in the retrieved policy documents, such as “housing system” and “housing lease”, a large-scale backtracking search was conducted to find 32 policy documents. In order to ensure the credibility of policy research, two related majors were passed. A research team composed of a master’s degree student and three undergraduate students was selected, and 25 policy documents with high correlation with the research were finally selected for research.

2.2. Standardized coding and credibility test
In order to better quantify and code the content of the policy system, first read each policy content carefully, and then extract key phrases with the help of machine word segmentation software and classify and calculate the word frequency of key phrases in the control policy system. In accordance with the principle of keeping coding type as perfect as possible, exhaustive and classification mutually exclusive and independent, two master students independently and manually screened key phrases according to the word frequency and combined with the policy content, and compared them to verify the credibility of the screening results. Test the statistical formula by reliability:

$$K = \frac{2M}{N_1 + N_2}$$

The credibility of the test results, where M is the number of consistent opinions of the two coders in the coding decision process. N_1 and N_2 are the total number of coding decisions made by each of the two coders. After testing, it was found that the consistency of the keyword group purchase restriction policy group was 85%. According to Nunnaly, a degree of consistency above 0.7 indicates that the previous study was sufficiently credible [3]. However, in order to ensure the accuracy of the research on the policy system, the teachers of the two related majors were further revised to the existing keyword group integration, and finally 34 keywords of the policy system related to housing purchase restriction were finalized. On this basis, the analysis unit that determines the structure of the housing purchase restriction policy is the three modules of policy objectives, applicable objects and means of action.

2.3. Analysis methods
Based on the general principle of content analysis, this paper integrates normative keywords according to the structure of the content of the policy system, and gradually constructs the content analysis structure framework of China’s housing purchase and control policy system. Using the common word analysis method to count the number of vocabulary occurrences of the same article, form a co word matrix and then cluster analysis, revealing the close relationship between vocabulary groups, and showing the structural changes of the vocabulary representing the subject and subject. This paper studies the control and control policy system of China’s housing purchase through the method of co-word analysis and content analysis. It hopes to use the unique advantages of the method to analyze the relevant policy system more accurately and identify the control system structure.

3. Empirical analysis and results

3.1. Extraction of keywords
Through the refinement of the keywords in the housing purchase and control policy system, this paper finally determines 34 key words of the relevant policy system. The summary can be divided into three major modules: policy objectives, applicable objects and means of action (see Table 1). Through the
statistical results, it can be initially obtained that the housing purchase restriction policy tends to increase the threshold for purchasing houses and thus achieve the purpose of adjusting housing supply and demand. From the frequency of keyword occurrence, financial institutions (16 times) have the highest frequency.

| Table 1 Key words vocabulary of housing purchase and control policy system |
|-----------------|---------------|-----------------|---------------|
| Housing purchase policy keyword | Keyword group | Frequency | Keyword group | Frequency |
| Policy objectives | Housing demand | 11 | Safe housing | 4 |
| | Speculative | 7 | Accountability system | 2 |
| | Housing supply | 6 | Long-term mechanism | 1 |
| The applicable objects | Financial institution | 16 | Ministry of Construction | 7 |
| | Committee | 14 | City Hall | 4 |
| | State Council | 11 | Responsible | 2 |
| | Municipality | 9 | Local government | 2 |
| | Related units | 8 | Single city | 2 |
| Means of action | Down payment ratio | 12 | Agency | 5 |
| | Personal Income Tax | 12 | ability to pay debts | 4 |
| | Credit policy | 12 | Tax certificate | 4 |
| | Differentiation | 11 | Land value added tax | 3 |
| | Lending rates | 8 | Sources of funds | 3 |
| | Social insurance | 8 | Medium and low price | 2 |
| | Provident fund | 7 | Overseas institutions | 2 |
| | Purchase qualification | 7 | Leverage behavior | 2 |

3.2. Drawing a network diagram
Within the scope of the housing purchase restriction policy, the frequency of each of the two keywords appearing in each policy document is counted (the same document is still recorded as one occurrence multiple times), and then compiled into a common word matrix using EXCEL, with the help of Ucinet software. The integrated Netdraw software processes it and obtains a network map of the housing purchase restriction policy, as shown in Figure 2:
In the network map, the thicker the network line, the more the two keywords are co-occurring, and the closer the keyword is to the middle of the map, the higher its central position in the network map. It can be seen from Figure 2 that the location of financial institutions and credit policy in the network map is close to the center, indicating that the housing purchase and control policy system is closely related. It can be seen from the network map that the keyword group close to the middle position has a high degree of co-occurrence with other surrounding keywords, and there are no isolated keywords. This shows that all the keywords in the housing purchase and control policy system form the overall network implements overall control over housing supply and demand.

3.3. Point centering analysis

The point degree is a common indicator for characterizing the centrality of nodes in social network analysis. If a node is connected to many nodes, it means that the node has an important position and role in the network. In this paper, the greater the degree of point center in the co-word matrix, the higher the frequency with which a keyword appears together with other keywords, and the more likely it is to get the focus of the housing purchase and control policy system. In this paper, Ucinet software is used to calculate the degree of centrality of the housing purchase restriction policy through the Network-Centrality-Degree path.

| Key words                  | Absolute point degree(Degree) | Relative point degree(NrmDegree) |
|----------------------------|-----------------------------|---------------------------------|
| Financial institution      | 148.000                     | 40.771                          |
| Credit policy              | 134.000                     | 36.915                          |
| Down payment ratio         | 124.000                     | 34.160                          |
| Differentiation            | 118.000                     | 32.507                          |
| Housing demand             | 106.000                     | 29.201                          |
| State Council              | 99.000                      | 27.273                          |
| Lending rates              | 96.000                      | 26.446                          |
| Personal Income Tax        | 94.000                      | 25.895                          |
| Municipality               | 80.000                      | 22.039                          |
| …                          | ...                         | …                               |
| Industrialization          | 14.000                      | 3.857                           |
| Local government           | 13.000                      | 3.581                           |
| Single city                | 11.000                      | 3.030                           |

From the results of the point degree analysis in Table 2 (partial), it can be seen that the absolute degree of centrality of the “financial institution” in the housing purchase restriction policy is 148.000, and the relative degree of centrality is 40.771, which is in the first place. The keyword “institution” plays an important role in the housing purchase restriction policy, and the “credit policy”, “down payment ratio”, “differentiation” and “housing needs” keywords have a relatively important role. It can be concluded that in the housing purchase restriction policy, the “credit policy” and the “down payment ratio” are the main control measures for adjusting housing supply and demand and controlling housing prices. In light of the basic situation of the region, the “State Council” is the main leader, financial institutions cooperate with each other, strictly implement the “differentiated” housing “credit policy”, and continuously improve the. “First payment ratio” purchase threshold is the basic idea of the housing purchase restriction policy.

4. Conclusions and revelations

In this paper, the content analysis method is used to construct the coding analysis unit of the policy system. The social network analysis of the policy system is carried out by means of the common word analysis method, and the structure of the policy system of housing price control is further studied. Through the keyword classification and comprehensive refinement, three modules of policy objectives,
The applicable objects and means of action are formed, and the overall basic framework of the housing purchase and control policy system is constructed, as shown in Figure 2:

**The structure chart of China’s housing purchase restriction policy**

![Structure diagram of housing purchase and control policy](image)

The research in this paper has the following enlightenment on the formulation and introduction of the housing purchase restriction policy:

From the perspective of the government, the existing policy documents on the control of housing purchase restriction mainly control the housing sales restriction from the perspective of housing supply and demand, which to some extent has restrained the rapid growth of housing prices. However, the study found that the main control measures, such as “credit policy”, are all mandatory policy tools, which completely ignore the regulating function of the market itself, leading to a retaliatory rebound of housing prices; from the perspective of keyword group extraction, the policy system is not very high, but the media interaction has an active role in society, so the government will work next. We can step up efforts to improve the management and control policies of the above aspects.

From the perspective of real estate enterprises, through the analysis of policy system, how to ensure the balance of housing supply and demand and control the policy means of housing price growth are of great significance to the long-term healthy development of the real estate industry; from the analysis of policy social network, it can be seen that "down payment ratio" and "differentiation" are very important entry points for relevant units and enterprises to control housing purchase restriction measures. Actively cooperate with relevant departments to implement purchase restriction policies, strictly implement "differentiated" housing and "credit policies", and reasonably raise the threshold of "down payment ratio" to improve the long-term development of the real estate industry.

**References**

[1] Yang, S.S. (2016) The real estate destocking limit purchase city 90% already existed in name only, Why do first-tier cities stick to the purchase restriction?. Chinese times.
[2] Yan, J., and Lou, W.L. (2018) Research on the change of China's housing purchase restriction policy--from the perspective of multi-source theory revision. Theoretical exploration, 6: 96-103.

[3] Wu, B., Xu, M. (2017) The change of the subject focus of China's housing security policy--based on the analysis of common words and cluster analysis. Urban problem, 5: 89-97.

[4] Li, G. (2007) Content analysis method of public policy: theory and application. Chongqing university press, Chongqing City.

[5] Li, Y.P., Wu, S.T., Gao, F. (2009) Changes, comments and trends of China's scientific research fund management policies since the reform and opening up--content analysis based on policy texts. Scientific research, 10: 1441-1447.