Analysis on the Evaluation of Suburban Real Estate Investment Environment

—Taking Guangzhou as an Example

Silin Wu

Jinan University, Guangzhou, China
Email: ryanslim@163.com

Abstract

With the acceleration of China's urbanization, urban development has entered a new period of evolution, and suburbanization has become an important manifestation of this period. The suburbanization of real estate is an important form of urban suburbanization. It is a coordinated way of land use, population and transportation problems in the city center. It is embodied in real estate enterprises' investment in suburban real estate. Investment is an activity in which both income and risk coexist. Therefore, this paper selects the first-tier city of Guangzhou as the research object, and builds the evaluation index system and uses the principal component analysis method to comprehensively evaluate the real estate investment environment in the suburbs of Guangzhou. The analysis shows that the real estate market environment and infrastructure environment in the suburbs of Guangzhou are superior. The population and economic environment are hindered by the inherent attributes of urban development. At this stage, it is impossible to make greater adjustments. The conclusion shows that the comprehensive investment environment of real estate in the suburbs of Guangzhou is superior. As long as the government pays attention to the planning of suburban land use, the management of real estate investment types and the improvement of urban transportation system, suburban real estate investment can alleviate the problems in the city center.

Keywords

Suburbanization, Suburban Real Estate, Investment Environment, Principal Component Analysis

1. Introduction

In recent years, China's urbanization process has been accelerating and has be-

come a powerful driving force for economic and social development. Urbanization has caused the city to spread from the central area to the peripheral areas, forming a phenomenon of suburbanization. In large and medium-sized cities such as Beijing, Shanghai, and Guangzhou, the phenomenon of economic, population, and real estate suburbanization is particularly evident. In the process of urban suburbanization, the process of suburbanization of real estate has a clear leading role, and the process of suburbanization of population and economy is relatively slow [1]. At the same time, the real estate industry is also one of the pillar industries of the national economy, playing an important role in the development of the city economy and the stability of the national economy.

2. Literature Review

2.1. Summary of Suburbanization and Suburban Real Estate Research

Foreign scholars have studied the suburbanization and suburban real estate earlier than domestic scholars, and the research results are numerous, forming a relatively mature system. In the typical characteristics of suburbanization, some scholars believe that the population of the central city has a negative growth and the total amount is reduced [2]. In the classification of suburbanization, some scholars believe that urban suburbanization can be divided into suburbanization of population employment, suburbanization of manufacturing, suburbanization of retail industry and suburbanization of real estate, which has generated huge demand for various real estate properties [3] [4] [5]. In terms of suburbanization and suburban real estate development, Western scholars agree that the suburban development costs are low. Various industries are actively moving out in the form of industrial parks, and high-income populations are buying houses in urban suburbs to promote suburbanization. [6] [7]. In addition, in terms of the negative effects of suburbanization and suburban real estate development, some scholars have found through empirical research that it mainly includes the negative impact of the original central area of the city, the outdated urban transportation facilities, and the scarcity of suburban land [8] [9].

Domestic scholars' research on suburbanization and suburban real estate began in the early 1990s. In terms of the definition of suburbanization, some scholars believe that suburbanization is the process of urban urbanization expanding and expanding at the same time. The population, industry and commerce of the city have successively carried out the centrifugal movement from the inside to the outside [10]. In the study of the suburbanization dynamic mechanism, earlier scholars believed that it was mainly the dynamic mechanism of land use system, household registration system, old city reconstruction and new district development policy [11] [12] [13]. In recent years, some scholars have used satellite nighttime lighting data to empirically analyze urban suburbanization, and verified the impact of FDI on urban suburbanization [14]. With the development of suburbanization of real estate, more and more domestic scholars have

studied the development of suburban real estate. Due to the moderate scale of China's cities, the national conditions of the land and the level of economic development, some scholars believe that suburban real estate should be developed moderately, and must follow the three principles of transportation axis, sustainable development and the application of knowledge economy [15]. Some scholars start from the relationship between suburbanization and suburbanization of real estate. The study believes that the formation of the relationship between suburbanization and suburban real estate development is macroscopically the process of government system regulation and policy guidance. At the micro level, it is the regulation of individuals and enterprises under the market mechanism. Autonomous location selection process [16].

Suburbanization of real estate is an important manifestation of urban suburbanization. Domestic and foreign scholars' research on suburban real estate is rarely independent of urban suburbanization. The development of foreign cities is earlier than the development of China's cities. Many cities have experienced suburbanization very early. Therefore, foreign studies on suburbanization should be more perfect. Due to the lag of urban development level in China, the phenomenon of suburbanization is relatively late, so there is still a lot of research space in this field.

2.2. Summary of Research on Investment Environment Evaluation

Foreign research on the investment environment can be traced back to the 1960s. Two scholars, Isiah A. L and Peter M. B, proposed the concept of investment environment and proposed it in the Conceptual Framework of International Business Arrangement. "Cold and cold factor analysis method" to measure the investment environment. Behind them is Robert B. Stobaugh's grading scale analysis in the article "How to Analyze Foreign Investment Climate." After them, many scholars have studied the investment environment, but unlike them, these scholars mainly focus on international direct investment and regional investment, and focus on applied evaluation and quantitative analysis [17] [18].

Domestic research is later than abroad, and most scholars are constructing indicator systems for analysis. Some scholars use enterprise data and use five major evaluation indicators to study the impact of the investment environment of 44 cities in mainland China on the benefits of foreign-funded enterprises through regression [19]. With the rise of China's real estate market, many scholars began to study the real estate investment environment. Zhou Peng *et al.* (2010) used principal component analysis and Delphi method to use the statistical data of 22 provinces across the country to construct a comprehensive evaluation system for real estate investment environment, and ranked 22 provinces [20]. Some scholars take the city as the research object, and select 18 indicators of 5 categories, combined with cluster analysis to comprehensively evaluate the real estate investment environment in Wuhan city circle [21].

Combined with the research status in recent years, it can be seen that domestic research on suburban real estate is still in the theoretical analysis stage, and

there are few articles that use the index system to evaluate the investment environment of suburban real estate. Combined with the background of the country's rectification and regulation of the real estate industry in recent years, this paper selects Guangzhou as the research object, draws on the existing literature, builds a suburban real estate investment environment evaluation system, and uses principal component analysis method to 11 cities in Guangzhou. The district conducts comprehensive evaluation to provide reference for real estate development in the suburbs of Guangzhou.

3. Theoretical Basis and Empirical Basis

3.1. Theoretical Basis Related to Real Estate Investment Environment

1) International trade theory

In the theory of international trade, whether it is the earlier absolute superiority theory, the comparative advantage theory, the resource endowment theory and the new trade theory, the geographical division of labor is an important concept. Because of the geographical division of labor, the investment environment, a geographically diverse area, has the possibility and necessity of research [22]. Therefore, the international research on the investment environment was first applied in the field of international trade and investment.

2) Location theory

Location theory is an important theoretical source of investment environment research, and is devoted to studying the scientific laws of spatial distribution of economic activities. Among them, Thunnen's agricultural location theory, Weber's industrial location theory and Chris Taylor's central theory have laid the foundation for modern location theory research. Investment environment research is to integrate a macro and even micro-regional environment. The evaluation is based on the location theory to construct analytical indicators for investment location research.

3.2. Real Estate Investment Environment Index System

The construction of real estate investment environment indicators in China is mainly constructed according to the general investment environment model. The index system is divided into several categories, and several indicators are selected in each category to form a comprehensive evaluation system for investment environment indicators to comprehensively evaluate the real estate investment environment in each region. This research method has strong subjectivity for the selection of indicators, and it is impossible to achieve complete objective analysis. Therefore, the results of scholars' research are closely related to the selection of indicators. From the research literature in recent years, scholars can generally divide the evaluation indicators of real estate investment environment into six categories: natural environmental factors, economic environmental factors, infrastructure factors, population environmental factors, real estate market factors, and social factors.

3.3. Empirical Basis

The research methods for index evaluation mainly include fuzzy evaluation method, similarity method, multi-factor evaluation method, analytic hierarchy process and principal component analysis method. Each analysis method has its own focus, advantages and disadvantages. Because of the limitation of city data used in this paper, the multi-factor analysis and the analytic hierarchy process requires high quality and quantity of data, the principal component analysis method is adopted.

1) Principle of principal component analysis

Principal component analysis studies are based on the premise of less information loss, and many related indicators are attributed to several representative indicators, namely principal component factors. Then use less factors to express the information contained in the overall indicator to achieve the so-called "down dimension processing" [23]. The equation for principal component analysis is as follows:

$$\begin{cases} F_1 = a_{11}X_1 + a_{21}X_2 + \cdots + a_{p1}X_p \\ F_2 = a_{12}X_1 + a_{22}X_2 + \cdots + a_{p2}X_p \\ \quad\quad\quad\quad\quad \vdots \\ F_p = a_{1p}X_1 + a_{2p}X_2 + \cdots + a_{pp}X_p \end{cases} \quad (1)$$

2) Selection of main factors and evaluation process of indicators

The eigenvalues of the matrix are calculated by the correlation coefficient matrix composed of various indicators, and the main factor is selected as the eigenvalue is greater than 1 and the cumulative contribution rate is above 95%. After the main factor selection is completed, the principal component load matrix is calculated, and the index of the index and the principal component is calculated by the principal component load matrix, and then the data of each different region is brought into, and the comprehensive scores of each region are calculated and ranked.

3) Evaluation of principal component analysis methods

The principal component analysis method can reduce the dimensionality of a large number of indicators, and obtain several main factors determined by the indicators together. This reduces the number of analytical variables and facilitates the researchers to analyze the results. In addition, the method has low requirements on the quality and quantity of data, and the data statistics in the city analysis are incomplete and missing. The principal component analysis method can alleviate the consequences of these problems.

4. Comprehensive Evaluation of Real Estate Investment Environment in the Suburbs of Guangzhou

4.1. The Construction of the Evaluation Index System

According to the particularity of the real estate market and the development of suburban real estate, according to the principle of systemic, comparability, per-

tinence and availability, the paper draws on the existing literature and materials, from the economic environment, the real estate market environment, In terms of population factor environment and infrastructure environment, 15 indicators were selected to comprehensively evaluate the real estate investment environment in 11 districts of Guangzhou (see Table 1).

In order to apply this index to the analysis of the investment environment of real estate in the suburbs of Guangzhou, this paper uses the economic development level of each district in Guangzhou and the distance from the central city as the basis for judging the 11 districts of Guangzhou as the downtown area and the suburban area.

Among them, Yuexiu District is the old city of Guangzhou and the seat of the municipal government; Tianhe District is currently the commercial center of Guangzhou with the highest level of economic development; while Liwan District and Haizhu District are closer to Yuexiu District and Tianhe District. And the level of economic development is high, so it is included in the downtown area. As for the suburban and remote suburbs, the division is mainly based on whether there is a boundary on the administrative division in the downtown area. The large suburbs have no administrative divisions with the downtown area, so they are classified as distant suburbs.

4.2. Selection and Processing of Data

The data selected in this paper comes from the 2015 Guangdong Industrial Development Database, the 2015 Guangzhou Statistical Yearbook, and the 2015 statistical bulletins of each district. After screening and summarizing, the data of 15 indicators of 11 administrative districts in Guangzhou in 2015 were obtained.

Table 1. Guangzhou city real estate investment environment evaluation index.

Primary indicator	Secondary indicator
Economic environment	X1:GDP
	X2: Gross industrial production
	X3: The total retail sales of social consumer goods
	X4: Fixed asset investment
	X5: Actual use of foreign investment
Real estate investment environment	X6: Real estate investment
	X7: Commercial housing sales area
	X8: Housing completion area
	X9: Land area
Population factor environmen	X10: Per capita disposable income
	X11: The population density
	X12 the proportion of the employed population
Infrastructure environment	X13: Number of ordinary primary schools
	X14: Number of various health care institutions
	X15: General public budget expenditure

Due to the dimensional inconsistency of these 15 indicators, if the original data is used for analysis, the load factor may cause bias due to the inconsistency of the dimensions. Therefore, the original data needs to be standardized. In this paper, the Z-SCORE standardization method is adopted. The specific calculation formula is as follows:

$$ZX_{ij} = \frac{X_{ij} - \overline{X}_i}{\sigma_i} \tag{2}$$

In the Formula (2), X_{ij} represents the value of the i-th index of the j-th city, and represents the sample mean of the i-th index, and σ_i represents the sample standard deviation of the i-th index.

4.3. Construction and Solution of the Model

In this paper, SPSS19.0 is used to analyze the data of principal components. Firstly, the principal component analysis is performed on each of the first-level indicators, and the evaluation results of each level-level indicators are obtained and ranked. The evaluation results of each primary indicator are used as new variables to perform principal component analysis again, and the comprehensive evaluation results are obtained. The analysis process of this paper takes the economic environment level indicator as an example for specific analysis, and the remaining level 1 indicator analysis will directly give the result.

It can be concluded from the correlation coefficient matrix that the economic environment indicators have a good correlation, indicating that these indicators have overlapping information, and can be reduced by the principal component analysis. Then the main component is extracted, and the results are as follows (Table 2).

From Table 3, the principal component is extracted by a criterion whose feature value is greater than 1, and the cumulative contribution rate is greater than 85%, and two principal components are extracted, which are respectively denoted as F11 and F12. These two principal components contain nearly 90% of the original variable information, which can be analyzed on behalf of these five variables. Then, the load matrix obtained by the software respectively calculates the eigenvector matrix of the two principal components for each index, which is calculated by dividing the load factor by the principal component eigenvalue (see Table 4 for the results).

Table 2. Correlation coefficient matrix.

Standardized indicator	Z score (X1)	Z score (X2)	Z score (X3)	Z score (X4)	Z score (X5)
Zscore (X1)	1	0.313	0.758	0.657	0.623
Zscore (X2)	0.313	1	−0.256	0.556	0.727
Zscore (X3)	0.758	−0.256	1	0.376	0.108
Zscore (X4)	0.657	0.556	0.376	1	0.744
Zscore (X5)	0.623	0.727	0.108	0.744	1

Table 3. Characteristic values of the principal components, variance contribution rate, and cumulative contribution rate.

Main factor	Initial factor			Extraction principal factor		
	Eigenvalue	Variance contribution rate	Cumulative contribution rate	Eigenvalues	Variance contribution rate	Cumulative contribution rate
1	2.966	59.317	59.317	2.966	59.317	59.317
2	1.512	30.239	89.557	1.512	30.239	89.557
3	0.283	5.652	95.209			
4	0.194	3.871	99.08			
5	0.046	0.92	100			

Table 4. Attribute values of the original variables with respect to each component.

Standardized variable	Main ingredient	
	F_{11}	F_{12}
Zscore (X1)	0.291	0.279
Zscore (X2)	0.221	−0.452
Zscore (X3)	0.158	0.575
Zscore (X4)	0.302	−0.025
Zscore (X5)	0.297	−0.217

By calculating the obtained feature vector, the relationship between the original variable and the principal component is obtained as follows:

$$F_{11} = 0.291ZX_1 + 0.221ZX_2 + 0.158ZX_3 + 0.302ZX_4 + 0.297ZX_5$$
$$F_{12} = 0.279ZX_1 - 0.452ZX_2 + 0.575ZX_3 - 0.025ZX_4 - 0.217ZX_5$$
(3)

$ZX_1, \cdots, ZX_5$ in Equation (3) are the data after the index data is normalized. By taking the standardized data, the scores of the two principal components can be obtained, and then the variance contribution rate of the two principal components is used as the weight to calculate the economic environment. The score of the first-level indicator is then ranked. The results are as follows (Table 5).

From the comprehensive evaluation results of economic environment indicators, Tianhe District is the commercial center and economic center of Guangzhou. The economic environment assessment is the highest in the downtown area and the highest among all 11 administrative districts. In the suburban areas, the economic and environmental assessment scores of Huangpu District and Panyu District are in the forefront, and even exceed the two downtown areas of Liwan District and Haizhu District, which have great economic development potential.

The above is the principal component analysis process for the economic environment indicators. According to the above process, the principal component analysis is carried out separately for the three primary indicators of the real es-

tate market environment, the population factor environment and the infrastructure environment. Further, taking the obtained principal component as a variable and performing principal component analysis to obtain the comprehensive scores and rankings of the four major aspects, the results are as follows (Table 6).

Table 6 and Table 7 are the complete result of applying the principal component analysis method to analyze the fifteen indicators of the four categories of the eleven administrative districts in Guangzhou. The results include the scores of each level of indicators in each district and the corresponding rankings, and

Table 5. Comprehensive evaluation results of economic environment indicators.

District	F_{11}	F_{12}	Overall ratings	Ranking
Liwan	−0.71479	0.1848	−0.411034662	8
Yuexiu	0.08087	1.24576	0.474195232	3
Haizhu	−0.10786	0.45237	0.081303358	5
Tianhe	1.46383	1.57453	1.501191607	1
Baiyun	−0.34121	0.65207	−0.005824322	6
Huangpu	1.9431	−1.52947	0.770561981	2
Panyu	0.14145	0.40585	0.230723314	4
Huadu	−0.72434	−0.52022	−0.655410614	10
Nansha	0.44799	−1.40144	−0.176476672	7
Conghua	−1.4784	−0.53014	−1.158202667	11
Zengcheng	−0.71064	−0.5341	−0.651023178	9

Table 6. Analysis results of real estate investment environment indicators in various administrative regions of Guangzhou (1).

District	Economic environment		Real estate market environment		Population factor environment	
	Score	Ranking	Score	Ranking	Score	Ranking
Liwan	−0.4110	8	−0.2707	6	1.0305	2
Yuexiu	0.4742	3	−1.2264	11	1.6434	1
Haizhu	0.0813	5	−0.4652	8	0.9445	3
Tianhe	1.5012	1	−0.3926	7	0.9306	4
Baiyun	−0.0058	6	−0.5332	9	0.1273	5
Huangpu	0.7706	2	0.9318	2	−0.3161	6
Panyu	0.2307	4	1.1256	1	−0.3473	7
Huadu	−0.6554	10	0.3329	5	−0.7781	8
Nansha	−0.1765	7	0.4630	4	−0.8702	9
Conghua	−1.1582	11	−0.6329	10	−1.3871	11
Zengcheng	−0.6510	9	0.6677	3	−0.9775	10

Table 7. Analysis results of real estate investment environment indicators in various administrative regions of Guangzhou (2).

District	Infrastructure environment		Real estate investment environment	
	Score	Ranking	Score	Ranking
Liwan	−1.0338	11	−0.3059	9
Yuexiu	−0.5595	9	−0.3834	10
Haizhu	−0.3104	8	−0.1608	8
Tianhe	−0.0175	6	0.1724	4
Baiyun	1.3958	1	−0.1402	6
Huangpu	0.2638	4	1.1916	1
Panyu	0.9286	2	0.5736	2
Huadu	0.1513	5	−0.1575	7
Nansha	−0.3064	7	0.3947	3

the final ranking is given. The comprehensive score and ranking of the real estate investment environment. From the final results, the top four are Huangpu District, Panyu District, Nansha District and Tianhe District. Among them, only Tianhe District is located in the downtown area, Huangpu District and Panyu District are the suburban areas divided by the former, and Nansha District, as the location of the Guangzhou Free Trade Zone, has gradually become the main area of real estate investment in the outer suburbs.

4.4. Analysis of Empirical Results

1) The real estate market environment is the most important factor affecting suburban real estate investment.

It can be seen from Table 6 and Table 7 that the administrative districts with the highest real estate market environment, such as Huangpu District, Panyu District, Nansha and Zengcheng District, have a comprehensive ranking of real estate investment environment. Moreover, from the rankings of the other three major indicators in these administrative districts, it is not particularly high, indicating that the real estate market environmental factors account for the weight of the comprehensive score is the largest of the four first-level indicators. Therefore, the real estate market environment is the most important indicator for many real estate companies. Among them, the available land area determines the possibility boundary of real estate development, and the housing completion area plays an important role in guiding the real estate development decision. The commercial housing sales area is an important indicator of real estate enterprise investment return.

Huangpu District and Panyu District have the highest comprehensive scores in the suburbs, and the highest scores in all regions, indicating that the suburban region is currently the best real estate investment environment in Guangzhou, and has been presented the obvious trend of spreading to the suburbs. Nansha

District and Zengcheng District have the highest comprehensive scores in the outer suburbs, ranking first in the eleven administrative districts, indicating that the suburbanization of real estate in Guangzhou has gradually spread to the peripheral regions after years of development. Based on the analysis of the comprehensive real estate market environment, the investment environment of suburban real estate is better than the real estate investment environment in the city center.

2) The infrastructure environment plays an important role in promoting real estate investment in the suburbs.

From the ranking of infrastructure environment, the ranking of suburban and outer suburbs is significantly higher than that of the downtown area. This is quite difficult to understand. The possible explanation is that the urban area has been built over the years and the infrastructure is relatively complete. In recent years, the government has mainly developed infrastructure in the suburbs. The investment in suburban infrastructure construction is far more than that in the downtown area. This has led to the improvement of suburban infrastructure and the provision of various infrastructures due to the large land area, which offer a broader construction space to the infrastructures.

The development of real estate investment environment depends on the perfection of local infrastructure, especially the construction of infrastructure such as education, medical care and leisure. The infrastructure level in the suburbs of Guangzhou and the suburbs has gradually caught up with the downtown area according to the results of the indicators, which provides a great prerequisite for suburban real estate investment.

3) The population and economic suburbanization process is slow

In terms of population and economic environment, the downtown area score is far ahead of the suburbs. The city center includes a large number of development resources, relying on the development effect of the agglomeration economy, so that the surrounding areas and even the national population and economic resources are concentrated in the center of Guangzhou. Therefore, the results of the analysis of population and economic environment indicators are the inevitable result of Guangzhou's development to the present stage.

Through the above three empirical analysis, combined with the comprehensive scores and rankings obtained from the empirical analysis, the real estate investment environment in Guangzhou can be summarized as follows: First, due to restrictions on land resources and housing price constraints, the real estate market environment in Guangzhou suburbs is due to Downtown area. Second, in recent years, Guangzhou has vigorously developed suburban areas. For example, Nansha District has become a free trade zone through national policy construction, which has given vital development to the region; Huadu District is a new urban area that Guangzhou City wants to focus on, and it is also a theoretical city in Guangzhou's future city center. It is the guidance and support of these policies that has led to the construction of numerous infrastructures in the suburbs of Guangzhou. The public infrastructure such as education, medical care,

and leisure has gradually become complete, and has injected a booster into suburban real estate investment. Third, the current development of Guangzhou is still in the process of polarization development, and the agglomeration of population and economy will continue. Therefore, the degree of suburbanization of population and economy is relatively low, mainly due to the urban form of "squeezing suburban pines", which has hidden hidden dangers for suburban real estate development.

5. Impact of Real Estate Investment in the Suburbs of Guangzhou on Urban Economy

5.1. The Positive Impact of Suburban Real Estate Investment on Urban Economy

1) Suburban real estate investment shares the crowded population in the downtown area

Suburban real estate investment has caused some of the population in the downtown area to migrate to the suburbs, sharing the large population of Guangzhou and alleviating the pressure on urban land use. According to the data from the Guangzhou Statistical Yearbook, the population density of Yuexiu District in 2015 was 34,757 people per square kilometer, which was less than the 34,778 people per square kilometer in 2014. The population of Guangzhou in 2015 increased by about 400,000 compared with 2014. In the case of population growth, the population density of Yuexiu District in the city center decreased relatively, indicating that the population gradually shifted to the suburbs of Guangzhou. From the data point of view, the population density of the suburbs has increased to varying degrees, and the population distribution in Guangzhou tends to be reasonable. The investment and development of suburban real estate has created possibilities and conditions for the population to be redistributed in the city center and the suburbs. The choice of location for people to live has increased, and the continuous improvement of transportation infrastructure has also led to the strong interest in suburban housing with relatively cheap housing prices.

2) Suburban real estate investment slowed the growth of Guangzhou real estate market price

According to Marshall's market demand theory, when the market supply increases, the market price of goods will decrease relatively. This theory seems to be impossible to establish in the real estate market, especially in the first-tier hot cities like Guangzhou. However, suburban real estate investment has a certain degree of restraining effect on the real estate market price in Guangzhou. The rise in market prices on the macro level is not only affected by supply and demand, but also affected by various macro factors such as investment interest rates and inflation rates. Therefore, even if the supply and demand relationship remains unchanged, the price of the Guangzhou real estate market will rise due to factors such as inflation. In the case of the total amount of social capital, suburban real estate investment disperses the amount of real estate investment in

the city center, thus inhibiting the real estate price in the city center, thus realizing the suppression of the price growth rate of the real estate market in Guangzhou.

5.2. The Negative Impact of Suburban Real Estate Investment on Urban Economy

1) Unreasonable investment in suburban real estate has caused damage to the suburban ecological environment.

In the process of suburbanization of real estate, part of the population and industrial enterprises in the city center will also appear suburbanization, and the impact on the suburban ecological environment will be greater and greater. On the one hand, some industrial enterprises that pollute the people directly migrate from the city center to the suburbs. When such enterprises go to the suburbs, the intensity of supervision will be reduced. The sewage treatment technology will be reduced compared with that in the city center, and the capital investment of sewage facilities will be reduced, and its environmental damage will be expanded. Transfer to the suburbs. On the other hand, suburban residential development, while meeting the needs of suburban living, also increases the daily garbage. The infrastructure construction in the remote suburbs of Guangzhou such as Huadu District and Nansha District lags behind the urban central area. Its ability to deal with urban pollution is still far from enough. For example, the sewage treatment facilities are not perfect, so that domestic sewage and industrial wastewater are not treated. Or if it does not meet the standard, it will be discharged directly into the river network of the suburbs, resulting in water pollution. Although this kind of pollution is certain in production and life, it cannot be eliminated fundamentally, but it is possible to reduce the damage to the environment through some post-processing techniques. In addition, some real estate investors in the suburbs will choose beautiful landscapes for high-end residential development. Such development is destructive to the ecological environment of the region, which is likely to cause large-scale death of vegetation and river pollution in the region.

2) Suburban real estate investment causes employment and inconsistent living space, causing traffic problems

A large part of the investment development of suburban real estate comes from residential development. Although this kind of development can alleviate the land use, population and housing pressure in the city center, it also brings the problem of inconsistent employment and living space, which causes traffic congestion. The overall living standards of residents in Guangzhou are high. People in the city center are willing to choose to go to the suburbs. This is largely due to the fact that most families have sedans, which reduces the time cost of spatial inconsistency. According to the Arrow's impossible theorem, although there are many transportation options, there is no one that is satisfactory to everyone because of the large number of people involved in this choice. It is impossible for the Guangzhou Municipal Government to restrict the single and

double number of vehicles at the peak during the peak period. It is impossible to limit the flow of people in the subway during the peak period. Therefore, people living in the suburbs will drive to Guangzhou downtown and suburbs when they get off work. This has brought tremendous pressure. This phenomenon is particularly evident in the central areas of Tianhe and Yuexiu in Guangzhou. Some suburban areas such as Panyu District and Huangpu District have also experienced traffic congestion.

6. Policy Recommendations

6.1. Strengthening the Planning and Guidance of Land Use in the Suburbs

Incorporating suburban land use into the overall planning and specific plans of Guangzhou, the real estate development of suburban land should be strictly limited to the specific planned land. On the one hand, the planning of land use should meet the needs of various real estate investment in the suburbs. On the other hand, it must have a certain forward-looking nature, which is conducive to the regulation of supply and demand of suburban land. Suburban enterprises can be centrally managed in the form of industrial parks. While giving full play to economies of scale and agglomeration effects, unified construction of infrastructure, infrastructure and public facilities such as roads, communications, and hydropower can be realized. This aspect is conducive to the unified centralized management of corporate pollution, reducing environmental pollution, on the other hand can improve the utilization of suburban land and maximize the benefits per unit area. At the same time, when planning the suburban land, the government also needs to protect the limited cultivated land resources in the suburbs, especially to strengthen the protection of basic farmland, strictly review the approval system for basic farmland expropriation, and seriously deal with the acts of indiscriminate approval, litigation, and abuse of cultivated land. In the suburbs, the cultivated land that is not used should be restored to agricultural use within a time limit.

6.2. Strengthening the Management of Suburban Real Estate Investment Types

Suburban real estate investment types include residential investment, enterprise plant investment, leisure and entertainment investment, etc. These types of real estate will more or less change the original ecological environment of the suburbs and the lives of local people. Therefore, investment in the plant of a suburban enterprise should be selected in a region where the suburban population density is relatively loose and the regional ecological environment is less damaged. The investment in the house must take into account the life of the aborigines, try not to encroach on the living areas of the aborigines. For example, there are many fishing villages in the Nansha Free Trade Zone, which are local characteristics and should be protected. If residential investment in the Aboriginal area is required in the planning, appropriate housing compensation should

be provided to the Indigenous People to reduce the devastating effects of the investment. Leisure and entertainment investment can be used as a key investment direction. On the one hand, it can increase the types of life and leisure of local people and improve the sense of happiness in life. On the other hand, it can promote the development of local businesses, stimulate the consumption of local people, and promote the growth of the local economy. In addition, the government should strengthen the regulation of suburban residential market supply, and moderately reduce investment conditions for small and medium-sized, medium and low-priced commercial housing, affordable housing and low-rent housing, but strictly control the real estate investment of large-scale, low-density high-end residential buildings.

6.3. Accelerate the Construction of a Suburban Integrated Transportation System

Judging from the traffic layout of Guangzhou, the public transportation system in the city center is very mature and convenient for the citizens who work and live here. However, the development of the transportation system in the suburbs lags behind. In many areas, there are no corresponding subway lines and bus lines, and the construction of suburban traffic is very uneven. The suburbanization of real estate in Guangzhou has achieved some results. More and more people choose to live in the suburbs. The perfect transportation system in the city is difficult to coordinate the traffic congestion problem at the suburban junction. This depends largely on the inconsistency of the suburban transportation system. Therefore, the government should be more inclined to connect with the city center transportation system in the construction of suburban traffic construction, and build a suburban integrated transportation system. You can choose several large-scale regional transportation centers in the suburbs, and then connect with the city center transportation network. From the single-center urban transportation network to the multi-center urban transportation network, the multi-directional connection between the city center and the suburban traffic can be realized, thus alleviating real estate. Traffic pressure brought by suburbanization.

Conflicts of Interest

The author declares no conflicts of interest regarding the publication of this paper.

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