

## A STUDY ON REGIONAL DIFFERENCE OF CHINA'S PAID URBAN LANDUSE SYSTEM AND GRADING

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**ABSTRACT:** At present, paid urban landuse system is one of the most important economic reform in China. In the other words, landuse right can be transferred and land users must pay the rent to the state according to the quality of land. It is necessary to apply the theory of rent and location to the economic appraisal of urban land.

China is vast in territory. Its geographical condition and economic development vary from place to place, so does the urban land value. In order to reveal the difference of land value between different cities, the following method is used. (1) Analysing the factors and elements that affect the quality of urban land. Six factors including 17 elements were selected in this paper: macrolocation of a city, benefit of urban aggregation, infrastructure investment, output value of urban land, potential of urban land, and investment intensity. (2) Deciding the weight and value of each factor. (3) Appraising each element separately. (4) Accounting the value of all factors and getting the total appraisal score of each city. (5) Grouping the 430 Chinese cities into seven categories according to the appraisal values.

The result shows that all the cities in the category with the highest land output values are in the coast belt, whereas most cities in the inland and outlying areas are belong to the category with low rank. For example, 87% of the cities in the outlying regions are belong to the lowest rank. Although there are some relationship between the size of cities and urban land rank, generally speaking, the larger the city, the higher the urban land rank. In fact, the locational condition is the most important factor which influences the rank of urban land.

**KEY WORDS:** paid urban landuse system; differential rent; urban location; different cities' land grading

## I. IN THE COURSE OF URBAN LANDUSE REFORM

Recently, with the procession of economic system and open policy, the reform of Chinese paid urban landuse has shifted from theory research stage into large-scale practice. It has two indications. ① Since the October of 1988 the state has levied the landuse tax on all the cities, towns and industrial areas, which has somehow diminished the shortcomings caused by long-term free landuse system; ② Many cities has adopted the price-paying forms such as agreement, bid and auction to transfer the landuse right, which has created relatively good conditions to fully adjust urban landuse through economic measures.

Due to the great difference in the physical and economic aspects, the landuse forms and land price among cities differ dramatically. Therefore, the standard of urban landuse tax and price should vary according to the city's grade and its landuse level. At present, however, because of the lack of macro adjustment policy of paid urban landuse, landuse right transfer price is decided by local government and is in constant change, which not only violates the actual situation but also causes the loss of much rent from the government and the loss of favorite chances to develop land. One of the ways to solve the problem is to apply certain theory and method to the regional difference of Chinese cities' landuse and divide them into different grades. According to it, we can make responding macro land tax and price policy and lead the paid urban landuse system reform to a scientific track.

## II. THE THEORY BASIS OF GRADING DIFFERENT CITIES' LAND

A capitalism country where land is traded freely can use lots of land market information to discover the difference of rent and price among cities. Chinese situation is different from capitalism country. Since the 1950s, Chinese urban landuse system has adopted the form of administrative grant and land trade has been forbidden by law, so urban land has no price. Recently part of Chinese cities has transferred landuse right at a certain price, but a national wide market hasn't been set up, so we can't refer the foreign method of market analysis to discover the differences among Chinese cities. Under this circumstance, we can apply the thought of rent and location theory to the grading of different cities' land. The steps are: first set up the appraisal model of urban land profit, then add the weighted score of each appraisal factor, finally decide the grade. It has been verified by actual practice that this set of theory and method can reach the anticipated goal.

As early as the period of capitalism's rising development stage many famous western economists had done lots of research on rent and formed the so called classical rent theory. Marx accepted and absorbed the useful part of their theories and established the scientific rent theory. This theory, especially the differential rent theory, is still very important until

now in analysing land quality, evaluating rent level and deciding the standard of land use right transfer price.

Above all, Max divided rent into two kinds: differential rent and absolute rent. He believed that differential rent is caused by different land grades. As for China, influenced by such factors as natural conditions, resources, economic base and labour force etc., development condition and land output rate vary from city to city. According to the data of 1988, the secondary and the tertiary industry's gross domestic product per unit by urban land area, the net output value per unit industrial land area and profits tax per one million capital of the cities in the eastern coast regions like Jiangsu, Zhejiang and Shanghai is respectively 3.5, 2.75 and 1.9 times as much as those of the backward cities such as the cities in Gansu, Ningxia and Inner Mongolia. From above, it can be shown that there exists differential rent among cities with differently regional development conditions.

Secondly, differential rent can be divided into differential rent I and differential rent II. Differential rent I is the super profit caused by inputting the same amount of capital to two pieces of land which differ in soil fertility and location. Among different cities, there are locational differences in material producing area and product market etc. Obviously, the super profit brought about by intercity's locational differences should belong to differential rent I. Differential rent II is the superprofit generated when capital is consecutively put into the same land to make it more efficient. Lots of study has shown that the input intensity has a positive relation with the urban land economic benefit of other conditions are identical among cities. The reason is that more input to the city may improve the urban development conditions such as infrastructure, lifeserving faculty, environment quality etc. rapidly, and raise labour productivity and city's attraction, accelerate urban industrial agglomeration and increase the aggregation benefit of scale economy. Therefore the super profit gained by consecutive input on the urban land equates to the form of differential rent II.

### **III. TO ANALYSIS OF THE FACTORS AFFECTING DIFFERENT CITIES' LAND GRADING**

In all the factors affecting different cities' land profit, the most important ones are as follows: urban macrolocation, agglomeration scale, infrastructure, land potential, industrial structure and policy.

#### **1. Urban Macrolocation**

As a macrolocation conception, it reflects the interrelationship of a city with its surrounding region and its accessibility to the outside. Being the political and economic center

of a certain region, a city is always in intense social and economic relation with the area around it. Because a city not only needs material, power, subsidiary food and labour force which are transported from the outside but also depends on the surrounding region as its consumption market, the situation of its surrounding region affects its character and scale as well as its land output rate and level. Being a mobile center, a city's accessibility to the outside mainly depends on its transportation conditions. A rapid transportation network may shorten good circulating period, decrease material and product transporting cost and lead to more super profit. Guangzhou and Beihai are Chinese coastal open cities. The former is the largest economic center in southern China, whose hinterland is Zhujiang Delta area with high developing economy, brisk goods production and convenient communication network, so it should have higher level of land use right transfer price. On the contrary the latter is on Guangxi Province with a relatively poor hinterland and no railway till now. Moreover its harbour's yearly handling capacity is less than  $1 \times 10^6$  t, thus its rent level should be fairly low on account of its locational conditions. In view of national wide range, cities on the coastal region are on the front belt opening to foreign countries and they are also important harbours that link the inland cities with the outside so they have shorter distance to oversea material producing place and goods market and become the heated zones of overseas investment. More attention should be paid to their locational superiority in the grading of different cities' land.

## 2. Urban Agglomeration Scale

Because of the interdependence between different industrial and social colonies in a city, a certain degree of population and industry agglomeration in the city will lead to scale production and management. Thus the agglomeration benefit will be created. Besides, a city itself is a labour force and product consumption market. In large cities, there are well-equipped urban facilities and large shopping centers that can attract large amount of floating population so the agglomeration benefit will be gained in financial, circulation and consumption fields. For example, in Table 1, the total area of Tokyo, Osaka, Nagoya is only 10 percent of the whole country's area, but their population occupies 45%, industry 55%, and goods wholesale quantity 70%. Because of the high economic concentration, multitudinous working opportunity, high wage level and eager land demand, the land price of the cities in these regions is the highest of the whole country. On the other hand, in Hokkaido both the population and the city's scale are small, and the land price there is rather low.

## 3. Urban Infrastructure

Urban infrastructure includes power, water resources, transportation, communication,  
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environment afforestation and disaster defence system. It is the necessary physical base to develop cities and their land. The degree of infrastructure's equipment and its serving standard reflect the efficiency of economy operation. This will lead to a higher land inputprofit, generating a larger amount of differential rent II, which is the most important cause of the land price rising. In the developing area of a city, the land with fully equipped infrastructure is generally called ripe land while the land with no infrastructure is called unripe land. Given the same conditions, the prices of the two kinds of land often differ several to dozens times.

**Table 1 The price of Land in Some Cities in Japan (yen / m × m)**

Region	Residential area	Commercial area	Industrial area
Tokyo	96300	444900	44400
Osaka	82200	362800	60100
Nagoya	39300	140900	27900
Hokkaido	23600	116400	13500

#### 4. Urban Land Potential

The urbanization process is also the course of lots of other land being converted into urban land. Because land is an unreproducible and short resource, the urban land potential is determined by the suburban land resources and population density. Land market and land price are directly influenced by the cultivated land area per person. Japan, with the highest population density and the smallest cultivated land area per person of all the developed countries, has a far higher land price than that of America, England and Germany. In 1990, the published land price of the busiest commercial district in Tokyo is US \$ 258,000 per square meter. This is the highest record all over world.

China is a country with large population and small cultivated land. Due to the regional difference on physical, social and economic conditions, the cultivated land area per person and urban land area per person vary dramatically from place to place. So the land requisition cost and land transfer fund differ tremendously among regions. A case in point is the two coastal open cities—Dalian and Wenzhou. They have the similar amount of the national income per unit urban land area but Wenzhou has the far higher population density and eagerer land demand, its cultivated land area averaged by rural population is less than 0.033 ha, which is only 1 / 3 of that of Dalian. In 1989 the transfer price of six unripe plots in Wenzhou was between 1,683 yuan / m<sup>2</sup> and 2,235 yuan / m<sup>2</sup> whereas at the same period the transfer price of 9ripe plots in Dalian economic developing zone was between 350 yuan / m<sup>2</sup> and 525 yuan / m<sup>2</sup>. Apart from other reasons, the urban land potential is a unneglectable factor leading to so great difference on land transfer price of two cities.

## 5. Urban Industrial Structure

In China, the planned economy dominates, so such productive elements as capital, labour force are unfloatable between industries. On the other hand, on account of the price tilting policy, product of light industry and tertiary industry has a higher price than that of heavy industry and material producing industry, therefore a mean profit can't be found among industries, which influences the output rate of urban industrial land. Moreover, different industries differ vastly in landuse intensity due to their different characters, for instance, serving industry and light industry take up little land and have a rapid investment recovery rate while petroleum industry and chemical industry are characteristic of a high capital density and profit rate. Cities whose industrial structure mainly consists of these two kinds of industries can get a rather high level of rent. Cities where material producing industry dominates is on the contrary, for example, many mines which cover very large land area even can't afford the land use tax.

## 6. Policy

First of all, the state macro-policies of urban and regional development directly affect the investment tendency of basic construction. In the 1950s and the 1960s, according to the thought of productive force's even distribution and the security of national defence, state investment was concentrated on the inland and outlying area. So the locational superiority of the coastal area was weakened. Since the opening up and reform, the state economic policy has been tilted to the coastal belt and lots of capital has been invested there. Besides, various favorable policies have been implemented in the special economic zones and coastal open cities. Thus lots of overseas investment and technical faculties have been attracted there. As a result their economy and real estate industry have been developed rapidly.

Secondly being a economic as well as a political center of a region, cities of different administrative levels are treated differently in social and economic life. The higher the city's administrative level, the more its per square meter construction fund attained from the state; and the higher its infrastructure's serving standard. This has a certain degree influence on a city's differential rent.

## IV. THE INDEX SYSTEM TO GRADE CITIES' LAND

At present, multi-factor synthetic appraisal has widely applied to land classification within one city in China. If we want to use this method to grade different cities' land, a set of appraisal indexes should be properly chosen to suit the different situation. Therefore, we

omit the ordinary part of the method and put emphasis on the appraisal index system of different cities' land grading.

As we discussed above, the land quality grade among cities is mainly caused by 6 factors. Each of these factors consists of several elements and all of these make a orderly structure. Due to the co-relativity between factors and availability of data, we choose 17 indexes concerning 6 aspects as the base to set up the index system of multi-factor synthetic appraisal.

In Fig.1 there are responding indexes to urban location, agglomeration scale, infrastructure and land potential factors. Due to the lack of information we can't directly

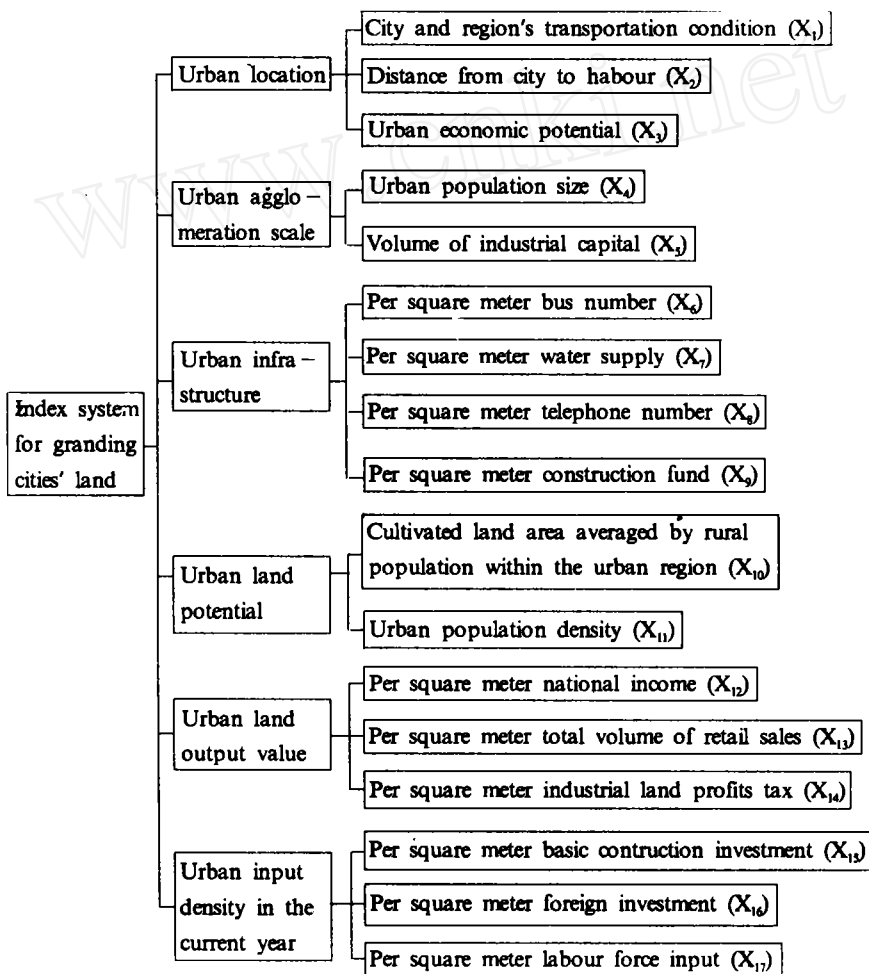


Fig.1 Index system for grading cities' land

quantitate the urban industrial structure but some indirect appraisal indexes still indicate its

influence to a certain degree. For example, per square meter urban land output value in coal cities is obviously lower than that in light industry city due to the price system twisting of industry products. Apart from this, the policy's influence is hard to be represented by existing statistic indexes. In this paper, we adopt per square meter basic construction investment ( $X_{15}$ ) and per square meter foreign investment ( $X_{16}$ ) to reflect policy from the economic side. According to Chinese current open policy, city with special zones, open city, provincial capital can enjoy many favored policies and the two indexes in these cities are higher than that in ordinary cities.

## V. THE RESULT OF CHINESE CITIES' LAND GRADING

Through the above appraisal indexes and method, we got the scores of 336 cities whose data are fully ready. Arrayed in a descending order, the first ten cities are Shanghai, Hangzhou, Beijing, Nanjing, Wuxi, Suzhou, Qingdao, Fuzhou, Guangzhou, Shenyang. All are the large cities in the coastal area. On the contrary, the small cities on the outlying area get the lowest score. The result of the scores consists with the theoretical analysis discussed before. According to the scores we divide Chinese cities into 7 grades.

It should be noted that because of the influence of the administrative division and statistical requirement, there are few cities whose scores do not fit their grades. For instance, the score of Tianjin is too low for its actual situation, it is largely because the urban area range in the statistic year book includes Tanggu, Hangu beside the center area and land use efficiency in there two suburbs is very low. Moreover, cities with special zones expand their built-up area fast and floating population has a heavy percentage in total population. The statistic data of 1988 is difficult to reflect every aspect. We rectify some errors of the data and adjust some cities' grade according to their actual situation and other referable data. As for the cities without enough data to attain their appraisal scores (most of them are county level cities established recently) we group them into suitable grades by analogy. So we get the initial results of Chinese 434 cities' land grading as follows: (cities of grade 5 to grade 7 are omitted)

Grade 1: Beijing, Tianjin, Shanghai, Dalian, Shenyang, Nanjing, Wuxi, Suzhou, Hangzhou, Xiamen, Qingdao, Guangzhou, Shenzhen, Shantou;

Grade 2: Shijiazhuang, Changchun, Harbin, Xuzhou, Changzhou, Nantong, Ningbo, Wenzhou, Shaoxing, Fuzhou, Quanzhou, Nanchang, Jinan, Zhengzhou, Luoyang, Wuhan, Changsha, Foshan, Dongguan, Chengdu, Chongqing, Xi'an;

Grade 3: Taiyuan, Anshan, Fushun, Benxi, Dandong, Jinzhou, Jilin, Lianyungang,



Yangzhou, Zhenjiang, Jiaxing, Huzhou, Jinhua, Hefei, Wuhu, Bengbu, Zhangzhou, Zibo, Yantai, Weifang, Anyang, Xinxiang, Yichang, Xiangfan, Shaoguan, Zhuhai, Jiangmen, Zhanjiang, Zhoushan, Nanning, Wuzhou, Guiyang, Kunming, Xianyang, Lanzhou, Urumqi;

Grade 4: Tangshan, Qinhuangdao, Handan, Xingtai, Baoding, Chengde, Datong, Yingkou, Liaoyang, Panjin, Jinxi, Yanji, Daqing, Mudanjiang, Huaiyin, Changshu, Yizheng, Quzhou, Fuyang, Nanping, Zaozhuang, Dongying, Jining, Tai'an, Huangshi, Shashi, Zhuzhou, Hengyang, Zhaoqing, Chaozhou, Liuzhou, Guilin, Haikou, Luzhou.

The initial analysis of Fig.2 shows that rent of Chinese cities obviously differ among regions and it is closely related to urban agglomeration scale.

We count the frequencies of cities in every grade distributed in three large territorial units—the coastal area, inland area and outlying area. Consequently, in high grades, the cities of the coastal area emerge more frequently than those of the inland area, and those of the inland area more frequently than those of the outlying cities. For instance, the 14 cities of the highest grade all lie in the coastal area and in all the 22 cities of next grade, 12 cities seated in the coastal area, 10 cities are in the inland area and none in the outlying area. Therefore, the regional difference of Chinese cities land grading is consistent with its population and economy distribution law.

Dividing all the cities into megalopolis, metropolis, middle-sized city, small city by their population size, we count the frequency of cities in every grade being distributed in these four groups. Conclusively, most megalopolis belong to the first three grades while small cities aggregate in low grades, especially in grade 7, their percentage exceeds 50%. This in fact reflects the difference in urban infrastructure, land use intensity and output value caused by the difference of urban agglomeration scale. It should be pointed out that due to the influence of urban location, there are a part—metropolises belonging to relatively low grade while some eminent middle and small size cities seated in the eastern coast are distributed in grade 2 to 4.

To sum up, land quality difference among cities is caused by two interacting laws—regional difference and urban agglomeration benefit. The practice of Chinese paid urban land use should be based on it.

## VI. CONCLUSIONS

As above, we combined the differential rent theory and location theory with Chinese concrete situation and initially revealed the factors affecting Chinese cities' land price

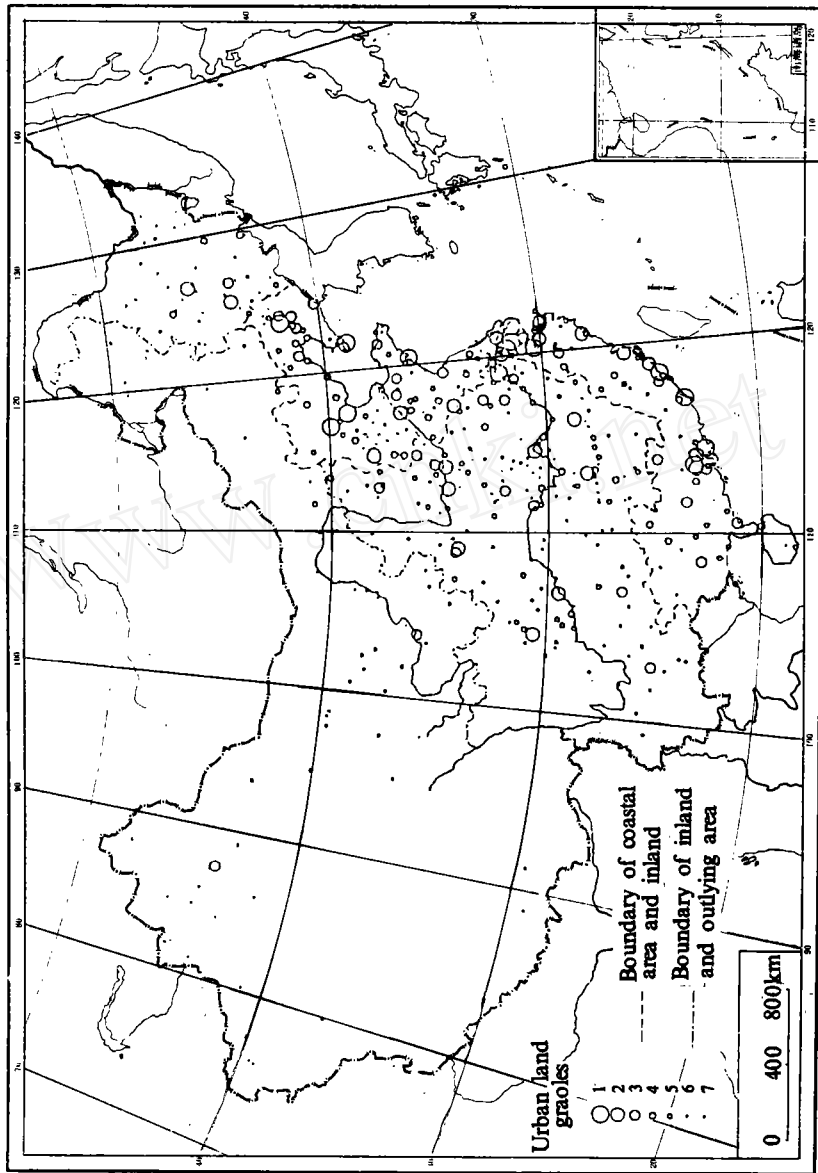


Fig.2 The map of China's urban land grading and zoning

rent and their regional difference. In order to check the accuracy and reliability of the grading result and raise its application value, the authors collected the opinion of more than 10 cities through the related department. The feedback information is that many cities agreed to the result and they also raised some useful suggestion about a few cities' grade.

Despite of all these, we believe that the result obtained by statistical analyses is hard to fully reflect the difference among cities' land because of Chinese immense territory and needs to be further tested by the reform practice.

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