

THE ANALYSIS OF URBAN SPATIAL DEVELOPMENT UNDER THE INFLUENCE FROM LAND POLICY: SHANGHAI CASE

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Abstract

China has started its reform of land market from planned distribution to market distribution by changing its land policy in 1988, at the time point of the first auction of usage right of one land in Shenzhen, in order to increase the efficiency of land distribution. In the early stage of economy development, land policy maximized the economic benefits and utilized the structure of urban space. However, with the speeding up of industrialization as well as rapid expansion of urban area, such reform led to the chaos on land market, which affected negatively on the efficiency of land distribution through market and utilization of functional planning on urban space.

The report aims to explain how the land policy influent the urban space by comparing difference between the policy and spatial development. And it also will explain the mechanism between the development of urban space structure and influence from the change of land policy, by studying the case of Shanghai, with applying the analytical methods from urban geography, urban economy and new institutional economy.

There are three main sections in this report. First section will apply the statistics method to analysis the influence of land policy on land market under different application subjects of land policy. Three aspects will be considered in this section: policy target, regulation subject, control measures. Furthermore, the second section will use the statistic method to analysis the quantitative change on the development of urban space structure of Shanghai with time series under the influence of land policy. The change of the urban space mainly reflects in urban form (increasing land for construction), land fragment and construction intensity (FAR). Finally, the third part will indicate applicable suggestion to the further land policy constitution based on previous analysis.

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1. Introduction:

In the past 50 years, cities in China were going through a fierce transformation of land market system and reconstruction of urban space. Sticking to the state ownership of urban land and collective ownership of the rural land, land policy was experiencing a great turning in either acquisition way or basic rights. Especially after 1988 Shenzhen-a city in the south of China-succeed granting the land via auction way marked that the land granting mechanisms in China transiting from administrative distribution to market distribution. Therefore in a long term, the land supply of China is on the double track. One is administrative way to grant state-owned land to certain users, especially for the municipal infrastructure. And another is market way to grant land by bids, auction or listing.

In the early reform, the imperfection of land market system and localization of financial management led to a series of different kinds of violations such as keeping land unused, property hoarding, and price rigging. And it also results in chaos of the construction land expansion and irrational structure of land use. System of tax distribution in 1994 especially made more significant influence in land use. The total revenue of local finance decreased from 78% in 1993 to 47.7% while the income of the real estate and construction all belonged to the local government, which further promoted local government to increase their fiscal revenue via selling construction land (Jiang Xingsan, 2010). And all these behavior dramatically changed the urban spatial structure. Take Beijing-the capital of China-as an example. The urban land area was doubled during only 7 years (1985-1992). And so it was in Guangzhou-another city in China, which expanded from 182.3 km² in 1990 to 376 km² in 2002. Meanwhile real estate began to blossom in the late of 1990s. The aggregate area of commercial residential building was up to 1,200,000 m² in 1996 from the 500,000 m² in 1992 (Ding Chengri, 2006). That meant the average annual growth rate is 25%, which was a surprise speed to the world.

As the market being perfected by varieties of land policies, effective land protection policies began to play a more and more important role in controlling expansion and disorder of the urban space (Huang Jinxian, 2009). Land scale, development intensity and land fragment were all influenced and adjusted by these land policies. Especially after 2000 when primary and secondary land market were basically formed and land policies gradually became perfect, those policies promoted the spread of urban space as well as inhibit the de-normalize development of urban space.

This paper is based on the relevant land policy published by national government during 1980-2010 and micro data of Shanghai's land market during 1995-2010.

Statistical method is used to analysis the evolution of the land policy and its influences to the urban space (including construction quantity, development intensity and city fragmentation) and help people understand the interaction between policy and space.

2. Analysis of land policy

The reformation of the land policy was actually started from 1980s in China. The national government of China published 93 land policies from 1980 to 2010. In these policies, 69 policies are directly bound up with the urban land, Accounting for 74% of the total policies. The annual number of land policies published by government increased every year. View from the control objects, in 1980s, the land policy controlled the urban land use only via controlling the construction land itself. However, in 2000s the objects of the regulation are not only the construction area but also the non-constructive ones, which both influent the structure of urban space. As an important capital element, land gradually was becoming more and more vital in the urban development. The influences of land policy to the development were also increasingly obvious.

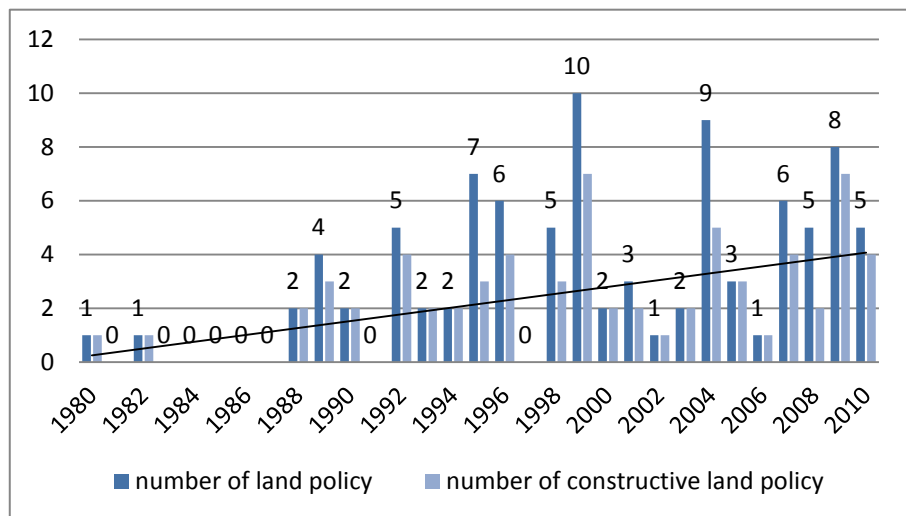


Figure 1. land policy distribution scheme (1980-2010)

According to the content of management, all the land policies can be decided into following types: planning policy, land use policy, price policy, land supply policy, cultivated land protection policy, tax policy, ownership policy, enforcement policy and cadastral management policy. In the early 1990s, tax policy and land supply policy are the main body of the published policies. And After entering the new century, companying with the maturity of the whole land market, the content of land policy became diversified. The regulation of Land use and minimum price policy, as

well as cultivated land protection were becoming an indispensable part of whole policy system, which help to regulate the land market and promote to form a rational land use structure.

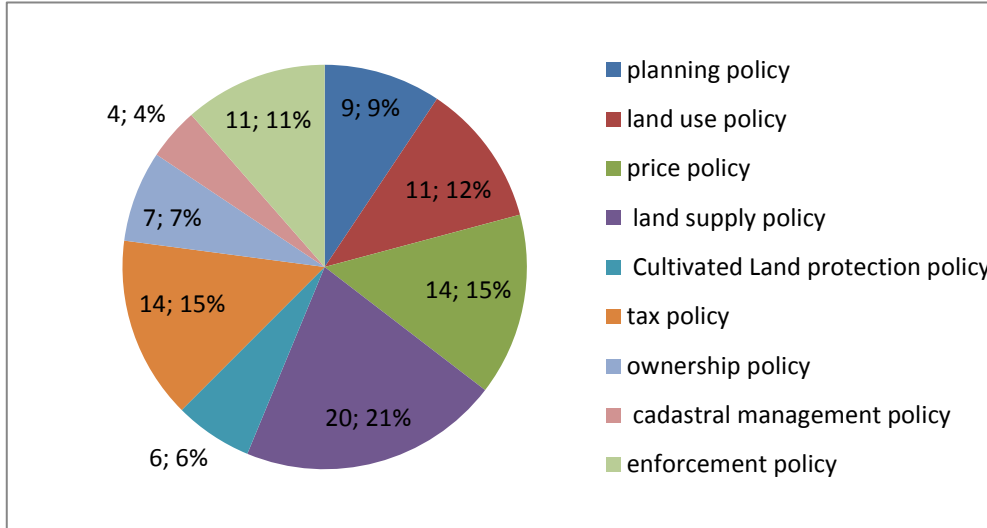


Figure 2.share of different manage content in the policy system(1980-2010)

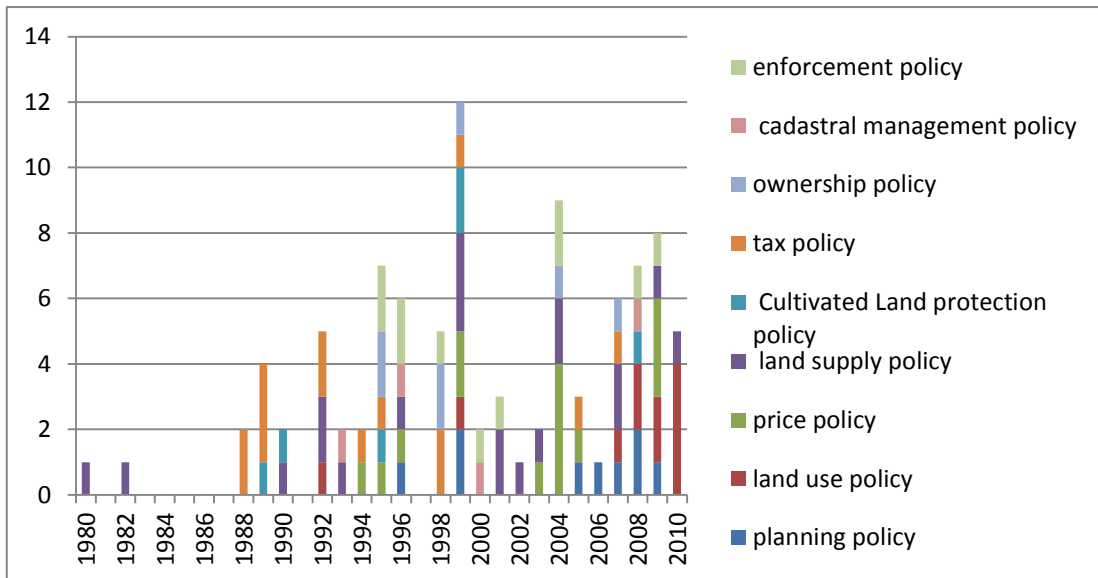


Figure 3. policy distribution scheme of different manage content each year(1980-2010)

According to the analysis of controlling object and management content ,the transiton period can be divided into three phases and they are as follows:

1)1980-1990: Transformation Period For Exploration

The transition of land policy from administrative distribution to the market

distribution in China began in 1980s. In this period, land supply policy and tax policy were the main body of all the policies granted by national government. These policy framed the most basic of land market operation rules. At first, the land royalties were paid in the form of site fee which only collected from Foreign investors(*regulation of construction land to the foreign venture enterprise published by The state council* in1980). And till 1988, the government officially published *the land royalties regulation of people's republic of China* and other relevant policies such as *supplementary provisions of Some specific questions about land royalties* etc. Land royalties became a main way to exploring the land market distribution in China.

2) 1990-1999: The Land Market Formation Period

In 1990, the state council published *the interim regulations about Land use and transfer of People's Republic of China*. It is the first comprehensive regulation about the state-owned land transfer method and essentially driving to the separation of the the land use right and ownership. Also in this period , right of transfer, lease, mortgage were clearly defined which meant the land market in China were truly formed. In this period of time, the management content became to diversity and land supply policy and land price policy became the main policy at that time. And main points were as follows:

- A. Further clarify the ownership of the land, and refine some related rights, such as lease, grant and mortgage etc.
- B. carry out land registration system to Find out ownership of each land.
- C. Evaluate land nationwide to form the basic price of the land market
- D. Limited the administrative transfer way and define the lowest transfer price
- E. Form the basic distribution mode of land revenue payments

After this period, land market were formed and standardised by all kinds of policies. Market distribution took place of the administrative one and became the main method to grant construction land and the basic price of land market were also formed at that time. The basic distribution mode of land revenue payments promoted local government pay more attention on the land value. Therefore, large scale of urban expansion was opening up.

3) 1999-2004: The Land Market Adjustment Period

In the year of 1999, *land administration law of the People's Republic of China* and its relevant enforcement regulations were published by the state council. In this regulation, land right were cleared, as well as the effect of land use planning. At the same time , policy pay more attention to the cultivated land protection and the use

control. In this period, there were a great demand of urban land with the maturity of the land market, the speediness of urban construction and the tremendous inrush of population. The urban land became a scarce capital to the local government. Therefore land policy in this time began to focus on the rational and normative land structure instead of land itself. The structure of the urban land use and scale were taken seriously, which were so different with the policies in the earlier time. Strengthen the role of urban planning, reuse of the vacant land and attach more importance to protection of cultivated land and national resources. And main points were as follows:

- A. Emphasize role of land use planning and urban planning, leading a rational and economic development.
- B. Emphasize the graded examination system in order to control the scale of urban construction and construction quality.
- C. Emphasize the regulation of disposing and reusing of vacant construction land, especially in downtown.
- D. Relevant provisions about farmland, rural residence and scale of towns and villages. Meanwhile stipulate 15% of the land transferring fees should be used in protection of farmland.

4) 2005-2010: The Macro-Control Period

In 2004, the Ministry of land and resources in China published a regulation which forbid all the business land be granted by administrative way from August 31 2004. This regulation meant that the market distribution, including auction, bidding and listing, became the only way to obtain the land-use right legally (except for military, affordable housing and infrastructure purpose, which can continue obtaining the land from government directly). In this period the national government limited the coverage of the administrative land and basically ended the double track of the land supply. Meanwhile, the ratio of land use policy increased sharply, strengthening control of land use as well as enforcement policy was published to deal with illegal behavior. Land, as a basic element of capital, began to take participation in national macro-control from this period. And main points were as follows:

- A. Set up the relevant examination and approval system for land use control, including residential projects, key construction projects, land use scale, conversion, rural residence base, limited land examination and approval system.
- B. Relevant regulation about transfer mode and minimum price of land grant fee.
- C. Strengthen the role of the annual plan for the land use

3. Analysis of urban spatial development under the influence from land policy

3.1 Introduction of Shanghai Spatial Development

Shanghai, as one of China's most developed city, is bearing a lot of capital and population. the resident population of Shanghai has reached 23.02 million by the year 2010, 89.3% of which were urban population. It is also the highest urbanization level in China. For Shanghai only has 6340 square kilometers of urban area, the population density has reached 3631 people each square kilometers by 2010. It is the most densely populated city in China. Especially during 1990s and 2000s ,with the tremendous inrush of capital and population, the city was expanding quickly. Relatively limited urban area, makes Shanghai have sharp contradiction between human and construction land.

As the other metropolis in the world, Shanghai also made a lot of work to make land use economic and rational, and experienced from “single center” to “more centre” during 1990-2010. According to town system planning, urban master planning and land use planning, Shanghai local government put forward a plan called “one city and nine towns” in 1999, which means set up nine new satellite towns around the main city. With the launch of the plan, the government figured out “1966” urban system in 2005 based on the former one.(1966 urban system means one main city ,9 new satellite cities, 60 new towns and 600 villages.) considering on the great changes of the urban space, it is meaningful for us to take Shanghai as the example to analysis the influence between land policy and urban space.

3.2 The Evaluation Method of Land Policy Influences on Urban Space

This paper uses the macro data of land transfer in Shanghai during 1995-2010 to analysis the influences of land policy to urban space. Influences of the land policy are diversity and the effect on one certain aspect would be quantified in this paper. Three aspects of the urban space are considered in the research: scale of the urban expansion, development intensity and urban fragmentation. And the quantification didn't represent the specific value but the trend of the influences. And the following characteristics of policies are considered in this process of quantification:

- 1) The effect of the policy is long-term and accumulating. The action spot of one policy is not one single point when the policy was published. Instead, the effect of one policy will last until it is abolished.
- 2) The effect of the policy will be explosive at first and then recess year by year. When the Policy (especially mandatory policy) appearing, it must play a larger role (either limitation or promotion) among the related department and aspect. As time pass away, the force gradually back to the balance point.

- 3) The effects of different policies are related. The regulation of one object may affect other aspects of the urban space indirectly. So policies have certain joint effect.

According to characteristics mentioned above, the index system of land policy quantification is set up as follows: (considering the first characteristic, the starting period should be earlier than the macro data of land transfer. Because of the small amount of land policy before 1990 in China, this paper chooses the land policy in 1990-2010 for this analysis.)

Index A:

Performance evaluation index of a policy on certain aspect

$$Y_{it} = \alpha_{it} * \beta_{it} * \gamma_{it}$$

Y_{it} : performance evaluation index of a policy on certain aspect.

α_{it} : The importance of the policy i on aspect t (define comprehensive laws as the value of 3, Special regulations as the value of 2, Mandatory policy as the value of 1 and suggestion as the value of 0.5)

β_{it} : the relevancy of policy i on aspect t (define no-relationship as the value of 0, Indirectly relationship as the value of 0.25, partly relationship as the value of 0.5, directly relationship as the value of 0.75 and mandatory provisions as the value of 1.)

γ_{it} : the trend of the policy i on the aspect t (define promotions as the value of 1 and limitation as the value of -1)

Index B

Performance evaluation index of policies on certain aspect in one year

$$Y_{nt} = Y_{(n-1)t} * \omega + \sum Y_{it}$$

Y_{nt} : Performance evaluation index of policies on t aspect in n year.

ω : Attenuation coefficient of the policy each year, in this paper the value was defined as 0.9, which only represents the trend instead of the specific value.

$\sum Y_{it}$: Sum total of the performance evaluation index of each policy in one year.

Establish coordinates with Y_{nt} and the time. The trend of the land policy on certain aspects can be seen clearly.

3.3 Influences Analysis

3.3.1 The Influences of Land Policy on Urban Space Expansion

In 1980s and 1990s, the spatial evolution of shanghai was Significant with both outgoing expansion and internal reorganization. On one hand, urban land expanded outside and doubled in five years. On the other hand, the development intensity of city was still growing, especially in the downtown. After the year of 2000, the scale of shanghai became stability and internal reorganization became the main way for the changes.

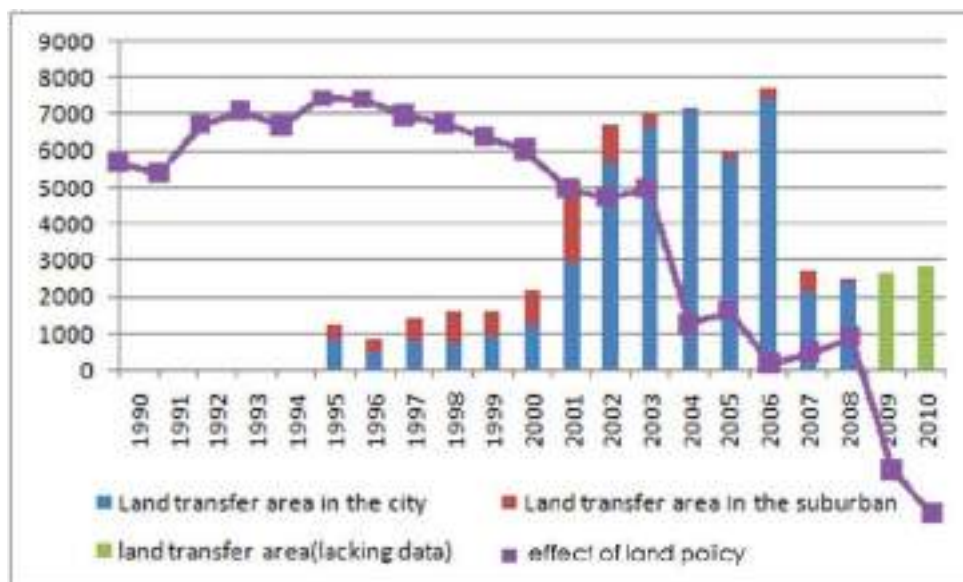


Figure 3. The influences of land policy on urban space expansion (1990-2010)

Between 1995 and 2010, about 15963 pieces of land were transferred in market way, which covered about 60031.11million square meters in Shanghai. The trend was like a curve. At the same time, the influences of the land policy to the urban expansion were waning. Especially after a series of policies about intensive land use and macro control of the land market were published in 2004, the urban space influenced by policy was obviously. And three stages are included in the whole period:

1) 1995-1999: Slow Growth Stage

In this period construction land transferred about 1366.99 million m^2 every year, accounting for 11.38% in 1995-2010. And at that time, not all the business land was transferred by market way, so that the scale of new expansion may be a little greater

than the data above. Stable was the characteristic in this time both for the policy effect and land expansion. The regulation about land right and the processing of illegal cases push the whole market to a regularization, which gave a lot of confidence to both developer and government. Meanwhile, the distribution of the land grant fee system also made the local government start to pay more interest to the land transfer. As the spatial distribution, although *management method of nature reserve land (1995)* and *management method of construction land use (1996)* were published to control city expansion, for the small amount of land transfer, all these policies didn't really work. In this period, space expansion was optional and the amount of new construction area in the city was almost equal to it in the suburbs. Developing everywhere without a correct guiding and lacking the reorganization of internal vacant land were two big problem of this period.

2) 2000-2006:Fast Growth Stage

This period is the fastest expansion in the 15 years with the speed of 6062.06million square meters per year, accounting for 70.68%of the total new area in these years. The land market is basically formed after the exploration for several years and the execution of *land management law of People's Republic of China* in 1999. The regularization of land market operation promoted the fast growth of land transfer. The regulation of land control were still strengthening in this period and more policies were published, including *agreement of granting state-owned land use right (2003)* and *announcement of continue to grant business land by bidding, auction and listing way (2004)* etc. This period is also a phase of world economic recovery; all the industries in the city were blooming this time. Local government took advantage of this opportunity to establish kinds of industrial parks to bring sustainable tax sources for the city. With the development of the industry, shanghai attract more population and services into it, which Speed up the city's expansion. Since late 2004, the national government realized the issue of land recourse limitation; policy became to transfer from encouraging to controlling, such as *The decision on strictly deepening the reform of land management by state council (2004)*, *announcement About the protection of basic farmland (2004)* and *The notice of reinforcement of land control by state council (2005)* etc. Although those policies pushed the expansion control to a new high level, due to the boom of the development, the expansion continued until 2006.

3) 2007-2010: Macro-Control Period

In this period, the average annual land transfer decreased to 2690.44million square meters, comparing to the amount in 2000-2006. In this period, the national government continued to publish a series of policies about urban control, including *The measures of annual plan for the land use control (2006)*, *notice on promoting the economical and intensive land use by The state council (2008)* and *announcement*

about land use control and vacant land management by ministry of land and resources in China (2009) and other limitation policies about Industrial land and residential land. At the same time, the expansion in 2000-2006 took a lot of pressure for Shanghai. According to statistics, by the end of 2006, the construction land of Yangtze River region (with Shanghai as the center) had already reach 17.4% (without water), which is much higher than the percentage of it in USA. Policy guide, expansion pressure and world financial crisis made the amount of land transfer of shanghai in 2007 plunge suddenly, and maintained in the certain level till 2010.

3.3.2 The Influences of Land Policy on Urban Intensity:

National government didn't published relevant policy to directly control the intensity of the urban development. Intensity was more controlled by macro control of the supply amount, which changed the overall intensity (overall intensity= urban area/building area) indirectly.

	1950	1960	1970	1980	1985	1990	1995	2000	2003
Urban area (km ²)	82.40	140.86	140.86	196.75	351.10	748.71	2057.01	3924.24	3924.24
Building area (million m ²)	4679	6140	7115	9134	12748	17256	22094	34206	51375
Overall Intensity	0.57	0.44	0.51	0.46	0.36	0.23	0.11	0.09	0.13

Table 1: table of comparisons among urban area, building area and overall intensity

According to the table above, the expansion of the city resulted in reduce of the city overall intensity. Because of the encouragement of land granting, the lowest intensity was came up in 2000, for only 0.9, which only a half of that in 1990. According to the comparison of policy effect and development intensity, they didn't match very well. However, from the figure 4 and figure 5, the growing of development intensity can be clearly showed, with the control of policies in 2000-2010

At the beginning of carrying out the new land transfer system, the amount of new land quantity was less; the expansion ability of Shanghai was relatively weak. The average FAR of the new urban land can maintain in a certain level. During 2000-2003, with the loose of the land policy and pursuit of sustainable tax sources for the local government, Shanghai expanded quickly. Especially the set up of several industrial parks around Shanghai resulted in the lowest FAR of new urban land these years. The reduction of the intensity was not only happened in the whole city, not also in the downtown. The quantity and intensity of the new development in downtown were also slow down. During 2000-2003, only 1387 new high buildings (8 floors and above) built in this time, and the construction area was 2265 million m². Comparing the large amount of the new granting land, the increase of the

development intensity in downtown was much less.

Since 2004, the government paid more attention on the intensive of the land use. The change of Shanghai from expansionary city to internal reconstruction brought a great opportunity to ascend the development intensity. The high buildings in the downtown were going up on after one in this period. Especially in 2007-2010, when the whole area of new transferring land was decreasing while the demand for inrush population and industry were still increasing, high density became the only way to deal with this conflict. During these four years, the average FAR of the new transferring land reached 1.55, which was 74.15% higher than that in 2002. That is to say, those control policies, not only control the city expansion and guide the urban development efficiently, but also promote the develop intensity much more economic and rational.

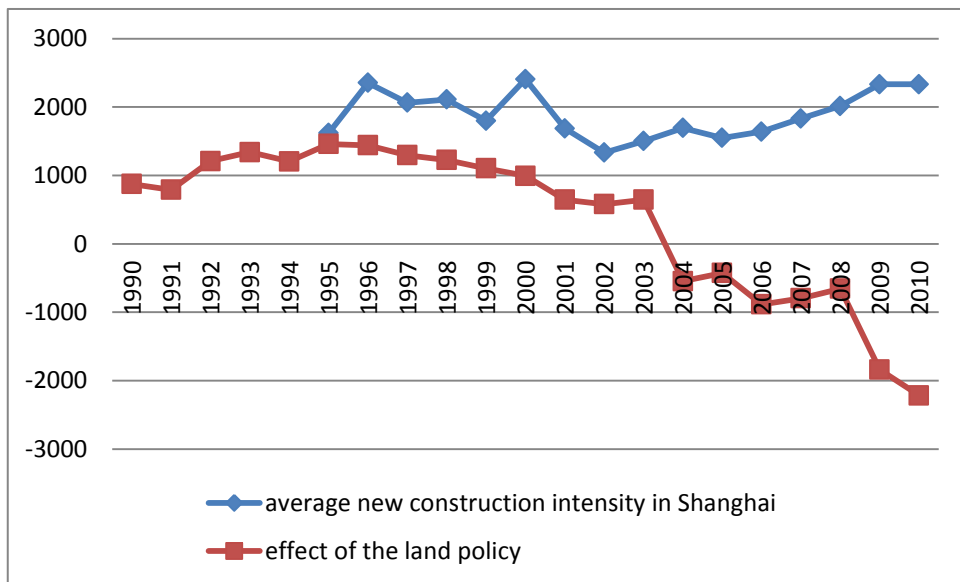


Figure 4. The influences of land policy on new land intensity (1990-2010)

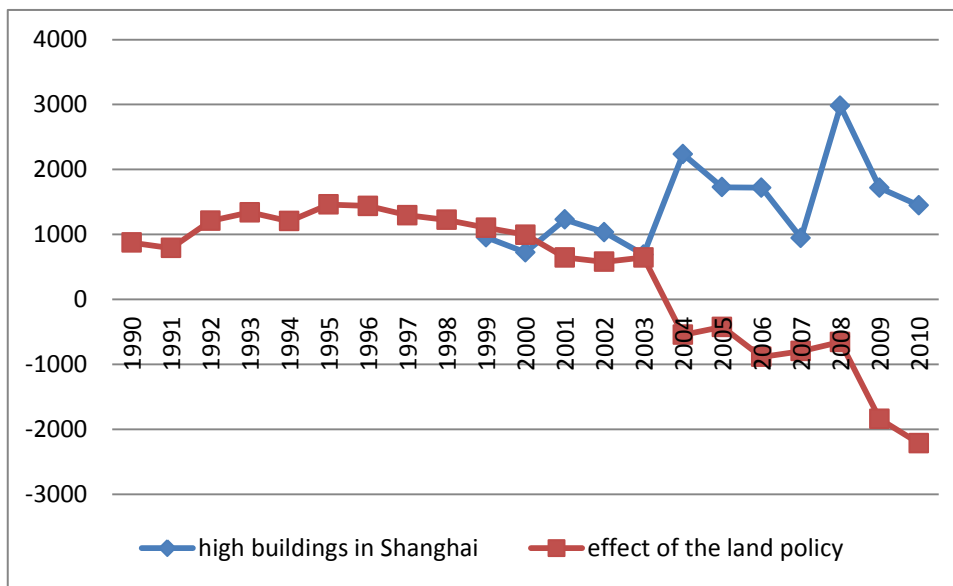


Figure 5. The influences of land policy on the amount of high buildings (1990-2010)

3.3.3 The influences of land policy on urban fragmentation:

Urban fragmentation is the performance for the land size in city, which measures the reasonability of the land size. Along with the development of shanghai and perfection of the property right system, the construction land were attached to certain use and cannot change it for a long time. Therefore the revival of urban land, especially in downtown became more difficult. The size of new developing land was reducing and the city space was tended to be broken. However, when the land reserve system came up in the late 1990s, the situation changed. With the effect of relevant authorities and policies, the land market became marketization and transparent, which provide an opportunities to integration of urban space.

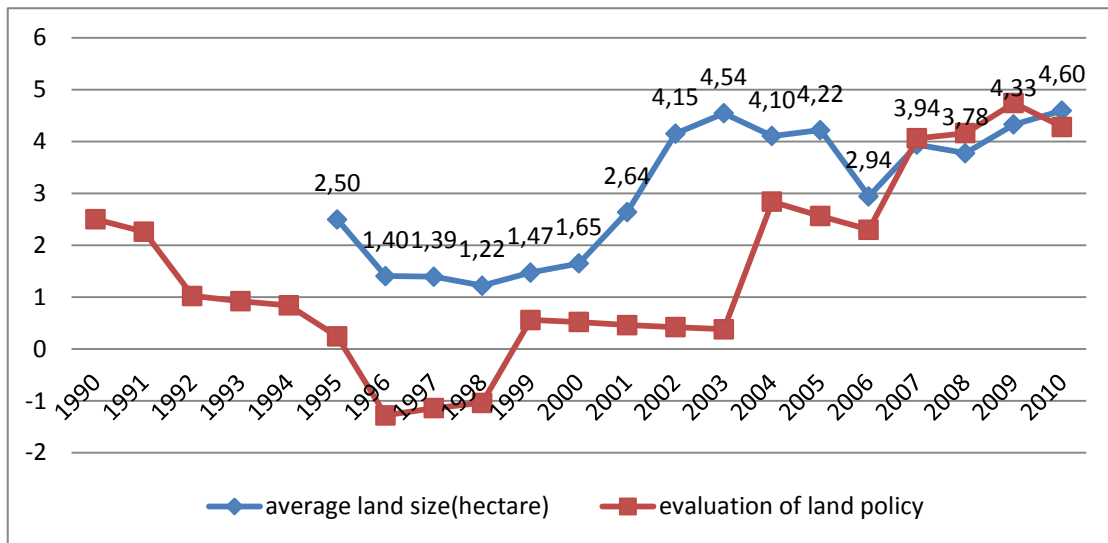


Figure 6. The influences of land policy on urban fragmentation(1995-2010)

According to the figure above, it can be seen clearly that there were two peaks and two troughs in the average land size from 1995 to 2010. From *the administration of encouraging large-scale development for foreign investors* which was published in 1990, China began to step into a era for construction. In 1992, the national government published several policies to define the property right and though land registration and land supervision to strengthen the management of the land use. So the space of shanghai became relatively fixed down and as the formation of land market price, the cost of demolition tended to be higher and higher, which made the city in the further fragment from 1995. The size of the transfer land in 1995 was 2.49 hectare. however, just 5 years later, the average of the land size was just 1.67 hectare in 2000, only 67.06% of that in 1995. Several reasons can be concluded as follows: 1) relative land policies to define the land right clearly resulted in the difficulty of urban demolition. 2) the lacking of policies for demolition made the chaos of urban revival. The tense relationship of the government and the residential delayed the step of urban intergration. 3) the common existence of vacant land and lacking of handling method hinder accerating the speed of fragment. 4) lacking of the effective administration. Raw land transfer which was common in China, make the whole land market lacking a plan of the urban space.

The phenomenon of space fragment was paid more attention by national government. From 1999, several of land consolidation and reservation policies were published, including The vacant land treatment method (1999), land reservation method of shanghai (2004) and the national management method of land reservation (2007). The land reservation means the government obtain the use right of the land through back, purchase requisition or other legal way, and reserve or consolidate them instead of transfer immediately. This behaviour was benefit for government to intergate the

urban space and grant them as the plan. The foundation of land reservation system marked the land transfer from the disorder to well-planned way. Unified demolition, unified facility supporting and reserve the idle, vacant and inefficient utilization state-owned land priority, made more effective of the city internal integration. Although the land reservation policy was published in 2004, shanghai set up the reservation center from 1996. Therefore, from the year of 2000, the influence of these policy worked out and the size of land increased to 4.59 hectare in 2010, much more rational than that in 2000.

4. Conclusions and Suggestions:

This research is focus on the influences of the land policy to the urban space. Because of the limited data, only national policy was considered in this paper, which has certain restriction. However considering the national policy is the guide of the local policy, it also has some significant meaning. At the same time, shanghai was experiencing several times of administrative division adjustment. So all the space data cannot correspond to the specific space spot, only macroscopic level can be analysis in this paper.

In this paper, we found that China's land policy was stability and continuity. From market formation, market cultivation and market control, the government basically finished the transformation of the land market from the administrative distribution to market distribution. What is more, it plays an important role in the crazy expansion of urban space in these years.

Secondly, the promotion of land policies to the urban space control was found in this paper. With the help of clear property right, the gradual tax system and appropriate regulatory, the land market in China developed quickly and paid more attention by both government and developers. Through the land use plan, the minimum price control and protection of farmland and national resource, the government try to control the scale of construction land and set intensive land use as the main criteria for the land transfer. At the same time, the land consolidation and reservation also play an important role in the rational and intensive urban space. The interaction of different policies became the key to rule the urban space to a healthier way from different angles.

Last but not least, the study also shows that the influences of land policy sometimes were not so directly to the urban space. It usually operates with a lag. So the stimulate of the outside environment, either economical or political was important to promote the whole policy to implementation, which became the turning point in the transformation.

China now is in a rapid urbanization stage, and the urban space is forming at this time. Whether the land policy guides the land use rational and effective or not, is meaningful to the urban planning in China. Therefore, following suggestion should be followed in the policy implementation in the future.

- 1) Continuing to strengthen the policy guidance of intensive land utilization. The policy should to be changed from a single suggestion notice to a mandatory policy, strengthening the legal binding of the land policy gradually.
- 2) Guiding the land use from various angles. Diversified ways should be adopted and the interaction of different policies should be noticed. Using the land planning policies, land use policies, land supply policies, and cultivated land protection policy, the land law enforcement surveillance policies comprehensively to guide the urban space.
- 3) As a leading policy, the land policy should be forward looking. Considering the policy effects have certain hysteresis, the policy should be cooperate with various aspects of external factors, such as the international economic environment, the orientation of the city, urban land and population capacity and so on. Only in this way can it lead the urban space to rationalize direction.

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