Scientific Research Publishing

Modern Economy, 2019, 10, 1134-1152
http://www.scirp.org/journal/me
ISSN Online: 2152-7261
ISSN Print: 2152-7245

Land Transfer Strategy and Industrial Structure Upgrading

— Analysis Based on Geographical Externality

Weifeng Sun

Institute of Economics, Jinan University, Guangzhou, China
Email: swfbee@163.com

How to cite this paper: Sun, W.F. (2019) Land Transfer Strategy and Industrial Structure Upgrading. *Modern Economy*, **10**, 1134-1152.
https://doi.org/10.4236/me.2019.104077

Received: February 21, 2019
Accepted: April 7, 2019
Published: April 10, 2019

Abstract

Based on 251 prefecture-level cities in China from 2003 to 2014, this paper examines the impact of land transfer strategies of local governments on the upgrading of industrial structure from the perspective of the first and second geographical externalities. The study found that: the local government land transfer strategy can improve the pace of local evolution from primary industry to secondary and tertiary industry; by increasing its relative share, it is conducive to upgrading the quantity of industrial structure upgrading; the local government land transfer strategy has uncertainties on the qualitative impact of industrial structure upgrading; the local government land transfer strategy has uncertainties; The influence of land transfer strategy on the rationalization of industrial structure is uncertain. Local government's land transfer strategy enhances local government's land transfer funds, strengthens local government's financial resources, and local government promotes the amount of industrial structure upgrading through the allocation of financial input. In terms of geographical externalities, the land transfer strategy of local governments is competitive, and the land transfer strategy of local governments can easily lead to the competition of funds, technology, talents and other resources among local governments.

Keywords

Land Transfer Strategy, Upgrading of Industrial Structure, Geographical Externalities

1. Introduction

The Nineteenth National Congress of the Communist Party of China put forward that China's economy has changed from a stage of rapid growth to a stage

of high-quality development. It is in a critical period of changing the mode of development, optimizing the economic structure and transforming the driving force of growth. Building a modern economic system is an urgent requirement for crossing the threshold and a strategic goal for China's development.

Land is an important factor of production. Manufacturing and service industries are inseparable from the effective supply of land factors. Since the reform and opening up, China's land system has undergone many changes. From 1987 when Shenzhen imitated Hong Kong's land lease system to the promotion of Shenzhen's experience throughout the country, laws and regulations such as the Constitution, the Land Management Law and the Interim Provisions on the Transfer and Transfer of Urban State-owned Land Use Rights have recognized the paid transfer of urban land. The reform of fiscal tax distribution system implemented in 1994 and the reform of income tax sharing in 2002 have made local financial power move up, and local governments are facing enormous financial pressure to perform their basic functions. With the great wealth effect of land and real estate marketization after the housing reform in 1998, the central government also intends to decentralize the local government to operate the land market. One concrete manifestation is that in 1999 the Ministry of Land and Resources transmitted the experience of land reserve system of Hangzhou and Qingdao to the whole country, and most cities began to imitate it very quickly. And implementation, thus truly established the institutional basis for the urban government to monopolize the supply of land. The Circular on Strengthening the Management of State-owned Land Assets issued by the Ministry of Land and Resources in 2001 also stipulates the establishment of a unified land supply system for urban construction land. Through a series of measures, the central government further strengthened the local monopoly power of land supply and directly promoted the rapid expansion of land finance. Under a series of policies and regulations, cities have gradually become the main monopoly of land supply, and land has become the key means of production. Local governments in China manage cities by controlling land, so as to realize the optimization and upgrading of industrial structure and even urban economic growth.

In the process of "competition for growth" by local governments [1], land factors played a key role. Cao Zhenghan *et al.* [2] put forward the theory of "control for growth" based on this fact, that is, local governments will use all resources they can control to promote economic growth. After the reform of tax distribution system, local governments will promote economic growth by monopolizing and controlling land supply. Wang Yuan *et al.* [3] demonstrated the relationship between local government land transfer strategy and economic growth, Xu Shengyan *et al.* [4] demonstrated that land transfer marketization promotes economic growth through financing effect and resource allocation effect. As for the relationship between local government land transfer strategy and industrial structure, the existing literature mainly studies the relationship between land finance and industrial structure, the relationship between land trans-

fer structure and industrial structure, and the relationship between low-price transfer of industrial land and industrial structure [5] [6] [7] [8] [9]. The existing literature often separates the land finance and land investment in the land transfer strategy and does not include them in the overall system analysis; the analysis of industrial structure mainly focuses on the quantitative analysis of the industrial structure, ignoring the analysis of the quality of the industrial structure and the rationalization of the industrial structure. Local governments are competitive and imitative, and there is spatial correlation between land transfer strategies and industrial structure, so spatial factors should be considered. This paper intends to analyze how the land transfer strategy of local governments affects the upgrading and rationalization of industrial structure from the perspective of the first geographical externality and the second geographical externality space.

The possible contributions of this paper include: systematic analysis of the impact of local government land transfer strategy on industrial structure upgrading and rationalization; analysis of how local government land transfer strategy affects industrial structure upgrading from the first geographical externality and the second geographical externality.

The structure of this paper is as follows: 1) Introduction; 2) Literature review; 3) Action mechanism and theoretical hypothesis; 4) Research design; 5) Empirical results and analysis; 6) Conclusion and countermeasures.

2. Literature Review

As an important factor of production, land transfer strategy of local government has an important impact on industrial structure. Tao Changqi *et al.* [10] considered that land finance had a non-linear effect on the rationalization of industrial structure. Huang Jinsheng *et al.* [9] through the establishment of the PVAR model of industrial land price and industrial structure change, think that industrial land price and industrial structure change can coordinate and promote each other in the same direction, but at the same time there are large regional differences. Chen Hao *et al.* [6] distinguished the two modes of transfer: agreement and bidding hanging. From the two dimensions of transfer area and transfer price, he believed that the land management behavior of local governments had an impact on the upgrading of industrial structure. Chen Hao *et al.* [7] used the spatial econometric model to analyze the impact of land prices in 281 prefecture-level cities on intra-regional industrial structure and inter-regional industrial transfer in China from 2003 to 2013. Chen Shuyun *et al.* [5] used 281 prefecture-level cities in China from 2003 to 2014 in terms of land transfer model and land transfer structure in the process of urban land management. The spatial panel model is constructed based on urban panel data at prefecture level and above. The impact of land transfer behavior of local governments on industrial structure upgrading is analyzed, and the sensitivity analysis is carried out. Zhao Xiang *et al.* [11] argued that the wider the gap between commercial and residential land prices and industrial land prices, the faster the growth of urban indus-

trial output. The existence of such a strategy may hinder the upgrading process of urban industrial structure driven by market forces. Existing studies have not fully considered the competition effect between local governments, nor have they systematically reflected the impact of land transfer strategies of local governments on the upgrading and rationalization of industrial structure.

The upgrading level of industrial structure is mainly measured from two dimensions: the upgrading of industrial structure and the rationalization of industrial structure. The measurement of industrial structure upgrading includes the measurement of industrial structure upgrading quantity and the measurement of industrial structure upgrading quality. The existing literature is discussing the influence of land transfer strategy of local government on industrial structure upgrading. The index structure of industrial structure upgrading generally adopts the weighted average of the proportion of tertiary industry to GDP or the proportion of three major industries to GDP. This index structure only reflects the increase in the amount of industrial structure upgrading, but it is difficult to reflect the industrial structure. Highlighting the quality aspect. The nature of industrial structure upgrading involves the evolution of proportional relationship and the improvement of labor productivity. Only when a country or region has a larger share of industries with higher labor productivity, can it show that the level of industrial structure upgrading in the region is higher [12]. The rationalization of industrial structure is a dynamic process in which the coordination ability and the level of correlation between industries are constantly strengthened. It reflects not only the degree of coordination among industries, but also the degree of effective utilization of resources. It is also a measure of the degree of coupling between input structure and output structure of factors [13]. Only by reflecting the industrial structure from these three aspects can we systematically grasp the impact of local government land transfer strategy on the upgrading of industrial institutions.

Local governments are compulsory in land expropriation and maintain a monopoly of supply in the land market. They promote land urbanization and GDP growth in the form of "low-price land expropriation, cost-price supply of industrial land, high-price suppliers of residential land, land offset financing for urban infrastructure construction" [14]. Specifically, the land transfer strategy of local governments focuses on the price of land transfer and the area of land transfer. To minimize the transfer area of commercial and residential land, increase the transfer area of industrial land, and then promote the transfer price of commercial and residential land higher than the transfer price of industrial land. The price ratio of "bidding and hanging" land transfer is mainly commercial and residential land, and the agreement land transfer is mainly industrial land. The price ratio of the two can reflect the distortion of the government's land price. The larger the ratio, the higher the priority of local government to industrial development. At the same time, the ratio of "bidding and hanging" land transfer area to the agreement land transfer area can also be achieved. Indicates the land

transfer strategy of the local government. Only through the comprehensive analysis of land price ratio and land transfer structure can we grasp the land transfer strategy of local governments.

Chen Hao *et al.* [6] and Chen Shuyun *et al.* [5] have proved that there exists spatial correlation in the structure of land transfer among regions. The quantitative analysis of China's provincial panel data from 1993 to 2009 by Luo Biliang *et al.* [15] shows that there exists obvious spatial strategy Imitation Behavior in the policy of land transfer among provinces and regions, and there exists cross-behavior. From the different types of land transfer, allocation shows competition in the number of land transfer, while agreement transfer shows competition in the area of land transfer; from the regional point of view, land transfer policies in the east, central and western regions have obvious strategic imitation behavior, including land transfer in the eastern region. Competition is more intense. Obviously, the upgrading of local industrial structure is not only affected by the strategy of land transfer in the region, but also by the strategy of land transfer in other regions. Because of the competition and imitation among regions, the spatial spillover effect of industrial structure upgrading exists in the region, and the spatial factor should be included in the model.

3. Functional Mechanism and Theoretical Hypothesis

Local governments levy rural construction land at a low price and integrate it into the land reserve center for unified management. The levy and leveling funds come from bank loans. For the expropriated land, most of it is supplied as industrial land at a low price, attracting investment; part of it is supplied as commercial and residential land at a high price to obtain high land transfer income; part of it is used for mortgage loans to banks, and local governments can not only repay bank loans with the help of the funds obtained, but also for the construction of urban infrastructure. Providing funds and improving urban infrastructure can not only attract more high-quality enterprises to settle in, but also promote the rise of land prices, increase the income of commercial and residential land transfer and land mortgage loans. The reduction of land supply will increase land prices and house prices, and then enhance the financing capacity of the government and enterprises, and increase land prices, so as to increase land prices. As the owner of urban land, the local government's ability of land financing has been enhanced. For enterprises, in the presence of financial friction, rising land prices and house prices increase the mortgage value of their own land and real estate, which can ease the financing constraints of enterprises [16]. Caballero etc [17] points out that asset bubbles generated by rising house prices are beneficial to economic development in the underdeveloped financial investment vehicles. By providing value storage targets, capital bubbles can be reduced, credit expansion and investment increased. Therefore, the local government land transfer strategy can ease the financing constraints of the city, enhance financing capacity, expand the scale of credit, promote the transfer of primary industry to

the second and third industries, and promote the upgrading of the local industrial structure. Based on this, we can get:

Hypothesis 1: Local government land transfer strategy can improve the pace of local evolution from primary industry to secondary and tertiary industry. By increasing its relative share, it is conducive to the upgrading of industrial structure.

The qualitative effect of local government land transfer strategy on industrial structure upgrading depends on grasping the theoretical connotation of industrial structure upgrading. The theoretical connotation of industrial structure upgrading involves the change of industrial proportional relationship and the improvement of labor productivity [18]. Only when the evolution of industrial structure promotes the improvement of labor productivity and the "structural benefit" of each industry, and when the industry with higher labor productivity has a larger share. Only when the industrial structure is highly developed [12] does it belong to the high-quality upgrading. In theory, appropriate industrial policies can lead the direction of industrial innovation development and help to improve the efficiency of industrial innovation [19]. 1) Local governments attract high-quality enterprises by creating various industrial parks, using policies such as low land prices, subsidies and tax preferences. Increasing the number of enterprises stationed will result in agglomeration effect, reduce production costs, increase exchanges and cooperation among enterprises, accelerate the flow and diffusion of knowledge, and be prone to strong positive externalities. On the one hand, preferential tax incentives and financial subsidies reduce the internal financing constraints of enterprises' independent innovation in high-tech zones, realize the transfer of factors from inefficient production sectors to efficient production sectors, and promote the industrial structure from low-level. Upgrading and evolving to a high level and realizing the upgrading of industrial structure [20] [21]. 2) Local government land transfer strategy will form a positive feedback mechanism, which will promote local government to further improve infrastructure construction, provide a better environment for enterprise transformation and upgrading, and further strengthen the innovative foundation and conditions of enterprises; at the same time, local government land transfer strategy will promote land prices to rise and gradually eliminate productivity. Lower industries, preserve the enterprises with higher productivity, and attract more high productivity enterprises through agglomeration effect, so as to improve the quality of industrial structure. However, in reality, there is a bottom line competition among local governments to reduce the quality of land investment [22]. The competition launched by local governments for GDP tends to promote the flow of land resources to enterprises that easily bring tax, GDP and other performance indicators, and distort the allocation of land resources by the market. It inhibits the upgrading of industrial structure. Industrial parks established by local governments, even in national high-tech zones, rely more on high-quality human capital [23]. However, the imperfect talent introduction

mechanism and rising labor prices have jointly squeezed park enterprises in two aspects of "insufficient pull" and "excessive push". Investment space for high-end human capital. The large-scale construction of industrial parks not only causes vicious local competition, but also causes the decentralization of resources, and the effect of human capital agglomeration is weakened. However, the conversion rate of most scientific and technological achievements in industrial parks is very low [24]. It is impossible to transform ideas into real products, and the value of labor can not pass through consumers in the end. The realization of purchasing can not promote the quality of industrial structure upgrading. According to the positive and negative effects of the above-mentioned land transfer strategies of local governments on the upgrading of industrial structure, this paper draws the following conclusions:

Hypothesis 2: The qualitative impact of local government land transfer strategy on industrial structure upgrading is uncertain. If the local government's land transfer strategy plays a more promotive role than a hindrance role in the qualitative upgrading of industrial structure, it can significantly promote the qualitative upgrading of industrial structure. Otherwise, it will inhibit the quality of industrial structure upgrading, so as to have only "virtual height" on the "quantity" of industrial structure.

Another channel for local government land transfer strategy to transform and upgrade industrial structure is through rationalization of industrial structure, which focuses on strengthening the coordination ability between industries and improving the level of correlation. The key industrial policies of the central government and local governments have an important impact on the resource allocation of local governments. To a large extent, the land transfer strategy of local governments reflects the key industrial policies. At the beginning of its implementation, the land transfer strategy of local governments has clearly defined the relevant target industries and provided clarity for the follow-up development of the park. To a large extent, the guide to industrial selection avoids blind investment and over-production in the process of industrial development, reduces frictions caused by unreasonable changes in industrial structure, reduces the cost of factor replacement, helps to optimize the allocation of resources among industries, and promotes the rationalization of industrial structure [18]. In the development of land transfer strategy of local government, on the one hand, through tax incentives and financial subsidies, we can change the price-to-price relationship of supporting industries, improve the potential demand for products and guide enterprises in the industry to expand investment. On the other hand, tax incentives and financial subsidies will affect the product consumption of supporting industries through income effect and substitution effect. Income effect means that tax incentives and financial subsidies increase the actual purchasing power of consumers in a disguised way, make consumers move out of budget and increase product demand. Substitution effect means that tax incentives and financial subsidies change the relative prices of products, thereby

changing consumer preferences. There is no doubt that the income effect and substitution effect will affect the output of various industries, promote the development of supported industries, and optimize the industrial structure [24] [25]. The information released by local governments through land transfer strategy can effectively compensate for the incomplete market information, improve the effectiveness of resource allocation, reduce the unreasonable fluctuation of industry, and promote the rationalization of industrial structure. With the rise of land price, enterprises will improve their rationality by eliminating the fittest according to market rules. However, in reality, the land transfer strategy of local governments still has a negative impact on the rationalization of industrial structure. At the beginning of its establishment, some local governments'land transfer strategies did not fully consider their own location advantages, industrial development goals, technological development level, and the degree of correlation and complementarity between industries. They failed to form a reasonable division of labor from the perspective of regional specialization division of labor, resulting in misallocation of resources and unable to achieve the goal of cooperation with each other. Many land transfer strategies of local governments have been established and developed under the external environment of long-term "fragmentation". The incomplete market mechanism and the imperfect legal system make enterprises lack the sense of cooperation and the relevance is not high [24], which is not conducive to promoting the rationalization of industrial structure. This is largely due to the competition among local governments. In order to achieve various performance goals, the long-term GDP-only idea urges enterprises, whatever they can contribute to GDP and tax revenue, to absorb them. With the transformation and upgrading of the national industrial structure, this phenomenon will change in the future. It can be seen that the role of local government land transfer strategy in rationalization of industrial structure includes two aspects: promotion and restraint, and the final effect depends on the net value of the superposition of these two roles. Based on this, this paper draws the following conclusions:

Hypothesis 3: The influence of land transfer strategy of local government on rationalization of industrial structure is uncertain. If the local government land transfer strategy promotes the rationalization of industrial structure more than inhibits it, then the local government land transfer strategy can promote the rationalization of industrial structure, otherwise it will hinder the rationalization of industrial structure.

4. Research Design

4.1. Econometric Model

Considering that this paper needs to analyze the relationship between local government land transfer strategy and industrial structure upgrading from "the first geographic externalities" and "the second geographic externalities", this paper takes spatial Durbin model (SDM) as the basic model of analysis, and the basic

model of this paper is set as follows:

$$\text{logais}_{i,t} = \rho W \times \text{logais}_{it} + \beta_1 \text{logpolicy}_{it} + \theta_1 W \times \text{logpolicy}_{it} + \beta_2 X_{it} + \theta_2 W X_{it} + \varepsilon_{it}$$

Logais is the index of industrial structure upgrading after logarithm; W is the spatial weight matrix. In this paper, the reciprocal of spatial distance of geographical unit is taken into account by the concept of distance, and the spatial weight matrix is established in the model. The coefficient represents the spatial correlation degree of industrial structure upgrading and the explanatory variables of other regions are understood in this region. The spatial correlation of explanatory variables; logpolicy represents the logarithm of land transfer strategies of local governments; X is the set of control variables, mainly including the level of local government expenditure (logsgov_ex), the level of economic development (logpgdp_0), the level of information technology (logIN), the level of urbanization (logUR), the level of opening to the outside world (logEP), and the base. Infrastructure input level (logBF), education level (logPT), I and t represent each cross-sectional unit and year, respectively.

4.2. Definition and Description of Variables

Explained variables. The interpreted variable of this paper is the level of industrial restructuring and upgrading, which is mainly measured from the two dimensions of industrial structure upgrading and industrial structure rationalization. Regarding the quantity of industrial structure upgrading, this paper uses Wang Wei's [26] method for reference and constructs a hierarchical index of industrial structure to represent the level of industrial structure upgrading. This index reflects the evolution of the three major industries in China from the dominant position of the primary industry to the dominant position of the secondary industry and the tertiary industry. It is the connotation of the quantity of industrial agglomeration.

In addition, using the practice of Liu Wei *et al.* [12] for reference, the connotation of the quality of industrial structure upgrading (ais2) is defined as the product weighted value of the proportional relationship between industries and the labor productivity of each industry.

This paper uses the Theil index to measure the rationalization degree of industrial structure of cities at all levels. The index has the good quality of taking into account the structural deviation between output value and employment of different industries and the different economic status of each industry.

Explanatory variables. The explanatory variable of this paper is the land transfer strategy of local government. The land transfer strategy of local government can be expressed from two aspects: land price and land area. As for land price, local governments sell commercial and residential land at a high price and industrial land at a low price. Therefore, according to the index constructed by Fan Jianyong and Mo Jiawei [14], this paper uses the ratio of land "bidding" price to the agreed transfer price (logpolicy1) to measure the land transfer strategy of local governments. Among them, the "bidding hanging" land transfer is

mainly commercial and residential land, and the agreement land transfer is mainly industrial land. The ratio of the two prices can reflect the government's land transfer strategy. At the same time, this paper chooses the ratio of the "bidding hanging" land transfer area to the agreed land transfer area (logpolicy2) to express the local government's land transfer policy.

Control variables: the higher the level of local government expenditure (logsgov_ex), the more conducive to industrial restructuring and upgrading in general; the level of economic development (logpgdp_0) is an important driving force for industrial restructuring and upgrading, this paper refers to the general practice of most literature, uses GDP to measure the level of economic development; information water LogIN is measured by the number of mobile phones per capita; the improvement of the level of urbanization (logUR) can promote the upgrading of industrial structure; the level of opening up (logEP) uses the proportion of foreign direct investment in GDP to measure economic openness. The data are converted according to the average price of RMB exchange rate over the years, which is generally considered to be foreign direct. Infrastructure input level (logBF) measures the level of urban infrastructure by the per capita area of urban roads, and the improvement of infrastructure will help to reduce transportation costs and transportation costs between regions. The low level of information circulation and the flow of production factors can have an important impact on the upgrading of industrial structure; the level of education (logPT) is controlled by the number of full-time teachers in general secondary schools per 100 people, which can improve the quality and cultural level of the local people, and then enhance the technological innovation ability of the region and its own externality. It is important to optimize the industrial structure. I and t represent each cross-section unit and year, respectively.

4.3. Data Sources and Descriptive Statistics

The data in this paper are from cities of prefecture level and above in China from 2003 to 2014, excluding cities with serious data missing. The final sample covers a total of 3012 sample values of 251 cities in China for 12 years. The data are from China Urban Statistics Yearbook and China Land Resources Yearbook. The data of some cities are missing in a certain year. This paper uses arithmetic average to complete the balance panel data in two years. Because the upgrading of urban industrial structure is mainly manifested in urban areas, this paper mainly uses the data of municipal districts for analysis. In addition, in order to minimize the problem of heteroscedasticity, all variables are introduced into the equation in logarithmic form. The descriptive statistics of variables are shown in Table 1.

5. Empirical Results and Analysis

5.1. Quantitative Analysis of Spatial Durbin Model

Table 2 gives the regression results of Spatial Durbin Model (SDM) under the

Table 1. Descriptive statistics of variables.

variable	name	average	Sta.dev	min	max	number
Industrial upgrading index	logais1	1.1661	0.04319	1.0198	1.3342	3012
Industrial upgrading index	logais2	4.06334	0.93837	0.2033	8.1037	3012
Industrial upgrading index	logais3	0.65006	0.09758	0.36252	1.1483	3012
Land leasing strategy	logpolicy1	2.3884	1.5967	0.000	10.0967	3012
Land leasing strategy	logpolicy2	1.8368	1.4752	0.00657	9.1169	3012
Government expenditure	logsgov_ex	7.1741	0.4695	5.7488	9.6059	3012
Economic development level	logpgdp_0	1.2084	0.5969	0.17321	3.8952	3012
Informatization level	logIN	0.45208	0.29407	0.000	2.4128	3012
Urbanization level	logUR	4.0117	0.1125	3.3359	5.0000	3012
Degree of opening up	logEP|	0.89774	0.6186	0.000	3.0498	3012
Infrastructure investment	logBF	2.2388	0.55153	0.01980	4.6947	3012
educational level	logPT	0.357859	0.07402	0.07325	0.84333	3012

weight matrix of distance space. From the regression results, we can see that there is a significant spatial correlation between the upgrading level of industrial structure among regions. The upgrading of industrial structure in a region can produce a positive spillover effect on adjacent regions. The positive spillover effect not only exists in the quantity and quality of the upgrading of industrial structure, but also in the rationality of industrial structure. In terms of chemistry.

From the perspective of the impact of land transfer strategy on the quantity of industrial structure upgrading, the influence coefficient of land transfer strategy on the quantity of industrial structure upgrading is positive and significant, which indicates that from the evolution of the proportion share of the three major industrial structures, the local government's land transfer strategy is driving the local industrial structure to dominate the primary industry. It has played an active role in the evolution of the dominant position of the secondary and tertiary industries, which is mainly due to the local government's land transfer strategy which mainly serves industry and commerce, thus taking the lead in achieving the upgrading of the local industrial structure and verifying the theoretical hypothesis 1. As far as price is concerned, from the first geographical externality, the impact of land transfer strategy in other regions on the upgrading of local industrial structure is significantly negative. In order to compete for enterprises' entry, the ratio of commercial and residential land to industrial land becomes larger and larger, and the competition becomes more and more fierce; from the second geographical externality, the local economy is more competitive. The influence of land transfer strategy on the upgrading of industrial structure in other regions is significantly negative. In view of the negative spillover effect of land transfer strategy, local land transfer strategy has become an important means to strive for performance resources among regions. This kind of game will lead to the decline and decline, and weaken the regional implementation

Table 2. SDM regression results under distance space weight matrix.

	(1) logais1	(2) logais2	(3) logais3	(4) logais1	(5) logais2	(6) logais3
Main						
logpolicy1	**0.0005****	**−0.0035**	**0.0003**			
	(0.0002)	**(0.0073)**	**(0.0008)**			
logsgov_ex	−0.0068***	0.2893***	0.0375***	−0.0067***	0.2826***	0.0370***
	(0.0016)	(0.0538)	(0.0060)	(0.0016)	(0.0539)	(0.0060)
logpgdp_0	−0.0021	0.7707***	−0.0018	−0.0024	0.7614***	−0.0016
	(0.0020)	(0.0696)	(0.0078)	(0.0020)	(0.0696)	(0.0078)
logIN	0.0091***	−0.0851	0.0065	0.0092***	−0.0791	0.0072
	(0.0025)	(0.0876)	(0.0098)	(0.0026)	(0.0877)	(0.0098)
logUR	0.0296***	0.6182***	−0.0246*	0.0296***	0.6073***	−0.0248*
	(0.0034)	(0.1171)	(0.0131)	(0.0034)	(0.1171)	(0.0131)
logEP	−0.0005	−0.0512*	−0.0089***	−0.0007	−0.0515*	−0.0088***
	(0.0008)	(0.0265)	(0.0030)	(0.0008)	(0.0265)	(0.0030)
logBF	−0.0024**	0.0843**	0.0047	−0.0023**	0.0833**	0.0047
	(0.0010)	(0.0344)	(0.0039)	(0.0010)	(0.0344)	(0.0039)
logPT	0.0253***	0.1237	−0.0263	0.0255***	0.1295	−0.0261
	(0.0053)	(0.1825)	(0.0205)	(0.0053)	(0.1826)	(0.0205)
logpolicy2				**0.0006****	**0.0051**	**0.0000**
				(0.0002)	**(0.0082)**	**(0.0009)**
Wx						
logpolicy1	**−0.0042*****	**−0.0069**	**−0.0031**			
	(0.0013)	**(0.0445)**	**(0.0050)**			
logpolicy2				**0.0003**	**−0.0527**	**−0.0099***
				(0.0013)	**(0.0454)**	**(0.0051)**
Spatial						
rho	**1.2390*****	**1.1839*****	**1.2894*****	**1.2479*****	**1.1865*****	**1.2850*****
	(0.0547)	**(0.0588)**	**(0.0431)**	**(0.0530)**	**(0.0584)**	**(0.0439)**
Direct effect						
logpolicy1	**0.0005****	**−0.0039**	**0.0002**			
	(0.0002)	**(0.0072)**	**(0.0008)**			
logpolicy2				**0.0006*****	**0.0040**	**−0.0002**
				(0.0002)	**(0.0080)**	**(0.0009)**
Indirect effect						
logpolicy1	**−0.0153****	**−0.0338**	**−0.0154**			
	(0.0066)	**(0.1417)**	**(0.0269)**			

Continued

logpolicy2				**0.0049**	**−0.1583**	**−0.0520***
				(0.0060)	**(0.1507)**	**(0.0304)**
Total effect						
logpolicy1	**−0.0148****	**−0.0376**	**−0.0152**			
	(0.0066)	**(0.1418)**	**(0.0270)**			
logpolicy2				**0.0055**	**−0.1543**	**−0.0523***
				(0.0060)	**(0.1507)**	**(0.0305)**
N	3012	3012	3012	3012	3012	3012
*R*2	0.410	0.410	0.410	0.410	0.410	0.410

Standard errors in parentheses *$p < 0.10$, **$p < 0.05$, ***$p < 0.01$.

of land transfer strategy on industry. Quantitative effects of structural heightening. Regarding the land transfer area, whether the first or the second geographical externalities, the influence of local government land transfer strategy on the quantity of industrial structure upgrading is not significant. There is no competitive relationship between local government and the allocation of land transfer structure in the region. Local government can use the land transfer structure. The allocation promotes the quantity of industrial structure upgrading.

From the qualitative impact of land transfer strategy on industrial structure upgrading, the qualitative impact coefficient of land transfer strategy on industrial structure upgrading in this region is not significant, which shows that the lack of high-end human capital, the "imbalance" of technological innovation can not lead to the innovation of the whole industrial chain and the low conversion rate of innovation results. The scale, industrialization and capitalization of the land transfer strategy have resulted in the failure to develop a strong regional innovation system, and the limited promotion of independent innovation ability hinders the improvement of labor productivity in various industries. The restraint on the quality of the industrial structure is greater than that caused by the enrichment of innovative resources and preferential policies. The promotion of industrial structure can not significantly promote the quality of industrial structure, which verifies the theoretical hypothesis 2. As far as price and land transfer area are concerned, whether the first or the second geographical externalities, the qualitative impact of land transfer strategy of local governments on the upgrading of industrial structure is not significant. There is no competitive relationship between the allocation of land transfer structure of local governments in the region. Local governments should give full play to land transfer. The qualitative positive effect of strategy on the upgrading of industrial structure promotes the positive effect to suppress the negative effect.

From the point of view of the influence of land transfer strategy on the rationalization of industrial structure, the influence coefficient of land transfer strategy on the rationalization of industrial structure in this area is not significant,

which indicates that the unreasonable allocation of resources, the low degree of inter-industry correlation and the park are caused by the lack of comprehensive consideration of their own location advantages and industrial development goals. Facing the external market environment and imperfect institutional mechanism of "block division", the cooperation among enterprises is reduced, the level of association among industries and the efficiency of resource allocation are further reduced, and the adverse effects on the rationalization of local industrial structure are weakened, and the positive effect of land transfer strategy on the rationalization of industrial structure is weakened. As a result, the driving effect of land transfer strategy on the rationalization of industrial structure has not been fully demonstrated, which verifies the theoretical hypothesis 3. As far as price is concerned, no matter the first or the second geographical externalities, the influence of local government's land transfer strategy on the rationalization of industrial structure is insignificant. There is no competitive relationship between local government and the allocation of land transfer structure in different regions. Local government should give full play to the land transfer strategy to rationalize industrial structure. The positive effect of transformation promotes the positive effect to suppress the negative effect. As far as the land transfer area is concerned, from the perspective of the first geographical externality, the impact of land transfer strategy in other regions on the rationalization of local industrial structure is significantly negative. In order to compete for enterprises' entry, the ratio of commercial land to industrial land is getting larger and larger, and the competition is becoming more and more fierce. From the perspective of the second geographical externality, the impact of land transfer strategy on the rationalization of local industrial structure is significantly negative. Local land transfer strategy has a significant negative impact on the rationalization of industrial structure in other regions. In view of the negative spillover effect of land transfer strategy, local land transfer strategy has become an important means to strive for performance resources among regions. This game will lead to the decline and decline, and weaken the regional implementation of land transfer strategy on industry. The impact of structural rationalization.

The regression results of control variables show that the impact of local government expenditure level and infrastructure investment on the amount of industrial structure upgrading is significantly negative, while the impact of informatization level, urbanization level and education level on the amount of industrial structure upgrading is significantly positive; the level of government expenditure, economic development level, urbanization level and base are significantly negative. Infrastructure investment has a significant positive impact on the quality of industrial structure upgrading, while the degree of opening to the outside world has a significant negative impact on the quality of industrial structure upgrading; the level of government expenditure has a significant positive impact on the rationalization of industrial structure; the level of urbanization and the degree of opening to the outside world have a significant negative

impact on the rationalization of industrial structure.

5.2. Quantitative Mechanisms and Mechanisms of Higher Industrial Structure

From the above empirical analysis, we can find that the land transfer strategy of local government has a significant positive impact on the amount of industrial structure upgrading. The influence of land transfer strategy of local government on the quality of industrial structure and the rationalization of industrial structure is uncertain. Therefore, this part discusses the land transfer strategy of local government on the high industrial structure. The influence mechanism of quantification. Above all, the impact mechanism of land transfer strategy of local government on the quantity of industrial structure upgrading has been described theoretically, but there is no empirical test yet. This part explores through empirical research:

Hypothesis 1: Local government land transfer strategy promotes the scale of credit, promotes the development of financial industry, and then promotes the amount of industrial structure upgrading.

Hypothesis 2: The land transfer strategy of local government promotes the land transfer funds of local government, strengthens the financial resources of local government, and local government promotes the upgrading of industrial structure through the allocation of financial input.

Regression results of mechanism analysis are shown in Table 3. Regression structure omits control variables and retains only core variables. From Table 3, we can see that for the land transfer strategy of local government, whether from the land transfer price or the land transfer area, the land transfer strategy of local government has a positive and significant impact on the land transfer fee, and the land transfer fee has a significant positive impact on the industrial structure, which indicates that the land transfer strategy of local government has promoted the local government. The government's land transfer fund strengthens the local government's financial resources, and the local government promotes the upgrading of the industrial structure through the allocation of financial input. Hypothesis 2 is established. Local government's land transfer strategy has no significant impact on the total amount of credit whether it is land transfer price or land transfer area, which indicates that the local government's land transfer strategy does not promote the upgrading of industrial structure through the increase of the total amount of credit. Hypothesis 1 is not valid.

6. Conclusion and Countermeasures and Suggestions

Local governments monopolize local land resources and can regulate local industrial structure through land resources. Based on 251 prefecture-level cities in China from 2003 to 2014, this paper examines the impact of land transfer strategies of local governments on industrial structure upgrading from the perspective of the first and second geographical externalities. The study found that: the local

Table 3. Regression results of mechanism analysis.

	(1) lnrz_1	(2) lnrz_1	(3) logais1	(4) lnjrdk	(5) lnjrdk	(6) logais1
Principal regression						
logpolicy1	0.0470***			0.0011		
	(0.0091)			(0.0029)		
logpolicy2		0.0246**			0.0052	
		(0.0102)			(0.0033)	
lnrz_1			0.0021***			
			(0.0004)			
lnjrdk						0.0123***
						(0.0013)
Wx						
logpolicy1	0.0008			−0.0049		
	(0.0566)			(0.0180)		
logpolicy2		−0.0185			0.0470***	
		(0.0570)			(0.0181)	
lnrz_1			−0.0115***			
			(0.0024)			
lnjrdk						−0.0209***
						(0.0054)
Spatial						
rho	1.2076***	1.2241***	1.1980***	1.3570***	1.3616***	1.2520***
	(0.0586)	(0.0554)	(0.0635)	(0.0279)	(0.0265)	(0.0524)
Direct effect						
logpolicy1	0.0478***			0.0008		
	(0.0089)			(0.0029)		
logpolicy2		0.0246**			0.0077**	
		(0.0100)			(0.0035)	
lnrz_1			0.0019***			
			(0.0004)			
lnjrdk						0.0122***
						(0.0013)
Indirect effect						
logpolicy1	0.2114			−0.0363		
	(0.2004)			(0.1602)		
logpolicy2		0.0604			0.5354*	
		(0.2242)			(0.2913)	

Continued

lnrz_1			**−0.0318*** **			
			(0.0098)			
lnjrdk						**−0.0247**
						(0.0234)
Total effect						
logpolicy1	**0.2592**			**−0.0354**		
	(0.2009)			**(0.1608)**		
logpolicy2		**0.0850**			**0.5431***	
		(0.2248)			**(0.2927)**	
lnrz_1			**−0.0299*** **			
			(0.0099)			
lnjrdk						**−0.0125**
						(0.0233)
N	3012	3012	3012	3012	3012	3012
*R*2	0.410	0.410	0.410	0.410	0.410	0.410

Standard errors in parentheses *$p < 0.10$, **$p < 0.05$, ***$p < 0.01$.

government land transfer strategy can improve the pace of local evolution from primary industry to secondary and tertiary industry; by increasing its relative share, it is conducive to upgrading the quantity of industrial structure upgrading; the local government land transfer strategy has uncertainties on the qualitative impact of industrial structure upgrading; the local government land transfer strategy has uncertainties; The influence of land transfer strategy on the rationalization of industrial structure is uncertain. Local government's land transfer strategy enhances local government's land transfer funds, strengthens local government's financial resources, and local government promotes the amount of industrial structure upgrading through the allocation of financial input. In terms of geographical externalities, the land transfer strategy of local governments is competitive, and the land transfer strategy of local governments can easily lead to the competition of funds, technology, talents and other resources among local governments.

This paper finds that the land transfer strategy of local governments is complex to the upgrading of industrial structure, but overall, the land transfer strategy of local governments has not significantly promoted the upgrading of industrial structure, which poses a serious challenge to the adjustment of industrial structure and high-quality development of China. In order to play the role of local government land transfer strategy in upgrading industrial structure, this paper puts forward the following countermeasures and suggestions:

1) Change the promotion mechanism of officials with GDP as the main criterion, taking the promotion of regional labor productivity and the coordinated and healthy development of regional industries as the criteria, so as to encourage

local governments to take these criteria as the consideration point in competition, give full play to the role of land transfer strategy, improve the quality of industrial structure upgrading and rationalize industrial structure change.

2) Strengthen the planning of coordinated development of regional industries, rationally allocate the proportion of industries, absorb enterprises with strong complementarity and coordination, and create a positive environment for enterprises to improve production efficiency.

3) Strengthen regional exchanges, learn useful experience, enhance strengths and avoid weaknesses, win-win cooperation, and let the region develop in cooperation and competition.

Conflicts of Interest

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

References

[1] Zhou, L.A. (2007) Research on the Promotion Championship Model of Chinese Local Officials. *Economic Research*, No. 7, 36-50.

[2] Cao, Z.H., Shi, J.C. and Song, H.S. (2011) Control for Growth—Regional Competition and Land Control by Local Governments in China. *Academic Research*, No. 8, 76-84.

[3] Wang, Y. (2016) Government Intervention and Land Price Distortion: An Analysis Based on National Micro-Plot Data. *China's Economic Problems*, No. 5, 29-41.

[4] Xu, S.Y., Chen, J. and Zhao, G. (2018) How to Promote Economic Growth by Marketization of Land Transfer. *China's Industrial Economy*, No. 3, 44-61.

[5] Chen, S.Y. and Zeng, L. (2017) Analysis of the Impact of Land Transfer Behavior of Local Governments on Industrial Structure Upgrading—Based on Spatial Econometric Analysis of 281 Cities above Prefecture Level in China. *Industrial Economic Research*, No. 6, 89-102.

[6] Chen, H. and Wei, Z.H. (2016) Land Management and Industrial Structure Upgrading of Local Government: An Empirical Analysis Based on Data of 281 Prefecture-Level Cities in China. *Industry Review*, No. 5, 585-596.

[7] Chen, H. and Wang, M. (2016) Urban Land Price, Industrial Transfer and Structural Upgrading. *Economic Review of Industry and Economics*, No. 4, 65-94.

[8] Chen, H. and Wang, M. (2016) The Competitive Effect of Land Transfer Behavior of Local Government in China. *Journal of Central University of Finance and Economics*, No. 10, 19-30.

[9] Huang, J.S., Chen, L.G., Zhang, Y.Y. and Zhao, A.D. (2017) Interaction between Industrial Land Price and Industrial Structure Change in China. *Resource Science*, No. 4, 585-596.

[10] Tao, C.Q. and Liu, Z. (2017) Can Land Finance Promote the Rationalization of Industrial Structure? An Empirical Study from Provincial Panel Data. *Financial and Trade Research*, No. 2, 54-63.

[11] Zhao, X. and Cao, J.B. (2017) Did the Local Government Promote the Upgrading of Industrial Structure by Two-Handed Strategies? Empirical Analysis Based on Panel

Data of 105 Cities. *Finance and Trade Economy*, No. 7, 64-77.

[12] Liu, W., Zhang, H. and Huang, Z.H. (2008) A Survey of the Industrial Structure Height and the Process of Industrialization and Regional Differences in China. *Economic Dynamics*, No. 11, 4-8.

[13] Gan, C.H., Zheng, R.G. and Yu, F. (2011) The Impact of China's Industrial Structure Change on Economic Growth and Fluctuation. *Economic Research*, (5), 4-16.

[14] Fan, J.Y. and Mo, J.W. (2013) The Transformation of Urbanization Mode and Economic Development Mode—Also on the Direction Choice of Urbanization. *Journal of Fudan* (*Social Sciences Edition*), No. 3, 65-73.

[15] Luo, B.L. and Li, S.P. (2014) Competition among Local Governments: Land Transfer and Its Strategic Choice: Empirical Evidence from China's Provincial Panel Data (1993-2009). *Academic Research*, No. 1, 67-78.

[16] Yu, J.W. and Tan, J. (2015) Housing Prices, Liquidity Effects and Corporate Financing Constraints. *Industrial Economic Research*, No. 4, 91-101.

[17] Caballero, R. and Krishnamurthy, A. (2006) Bubbles and Capital Flow Volatility: Causes and Risk Management. *Journal of Monetary Economics*, **53**, 35-53. https://doi.org/10.1016/j.jmoneco.2005.10.005

[18] Han, Y.H., Huang, L.X. and Wang, X.B. (2017) Has the Industrial Policy Promoted the Upgrading of Local Industrial Structure?—Based on the Theoretical Explanation and Empirical Examination of Developmental Local Government Test. *Economic Research*, No. 8, 33-48.

[19] Peters, M., Schneider, M., Griesshaber, T. and Hoffmann, V.H. (2012) The Impact of Technology-Push and Demand-Pull Policies on Technical Change—Does the Locus of Policies Matter. *Research Policy*, **41**, 1296-1308. https://doi.org/10.1016/j.respol.2012.02.004

[20] Ngai, L. and Passarides, C. (2005) Structural Changeina Multi-Sector Model of Growth. *American Economic Review*, **97**, 429-443. https://doi.org/10.1257/aer.97.1.429

[21] Krüger, J.J. (2008) Productivity and Structural Change: A Review of the Literature. *Journal of Economic Surveys*, **22**, 330-363. https://doi.org/10.1111/j.1467-6419.2007.00539.x

[22] Yang, Q.J., Zhuo, P. and Yang, J.D. (2014) Competition between the Bottom Line of Industrial Land Transfer and the Quality of Investment Attraction: Empirical Study Based on Panel Data of Prefecture-Level Cities in China from 2007 to 2011. *Managing the World*, No. 11, 24-34.

[23] Long, H.B. (2015) Problems and Challenges in the Development and Transition of National High-Tech Zones. *China High-Tech Zones*, No. 3, 44-46.

[24] Li, K., Ren, X.Y. and Xiang, T. (2007) Contribution of Industrial Cluster Effect to Technological Innovation Ability: An Empirical Study Based on National High-Tech Zone. *Scientific Research*, No. 3, 448-452.

[25] Tao, C.Q. and Liu, Z. (2017) Can Land Finance Promote the Rationalization of Industrial Structure? An Empirical Study from Provincial Panel Data. *Financial and Trade Research*, No. 2, 54-63.

[26] Wang, W., Liu, Y.F. and Peng, D.D. (2015) Study on the Upgrading Effect of Industrial Structure of Population Aging. *China's Industrial Economy*, No. 11, 47-61.