

Empirical Analysis of the Integration of Production and City in Western Regions

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Abstract: *This paper takes xi 'an city in the western region as the research object, USES the data from 2000 to 2015, and constructs the evaluation system of the development level of city and industry integration against the background of new-type towns, and conducts a quantitative evaluation on the development level of city and industry integration in xi 'an by combining principal component analysis and mutation series method. The results show that from 2000 to 2014, the integration level of xi 'an city and industry continued to improve, but in 2015, it decreased slightly. The sudden decline of the integration level of industry and city is analyzed from two dimensions: the level of industrial development and the level of urban development. The analysis of the level of integration development of the city of xi 'an shows that the level of integration development of the city of xi 'an has gradually developed from a low level to a high level. Finally, based on the actual situation, the paper puts forward some policy Suggestions to promote the development of the integration.*

Keywords: City and industry integration, development level, mutation series

1. Introduction and Literature Review

Under the new normal, China's economic development speed slows down, and the economic growth faces downward pressure. The economic growth is slowing down, but the economic development mode has not been changed yet, which is still in the extensive mode, and cannot be matched with the current economic environment, resulting in numerous problems in economic development. In order to solve the new difficulties of economic development, the Chinese government proposed the supply-side structural reform, aiming at starting from the supply-side, adjusting the industrial structure, solving the problems of structural contradictions, and adding new impetus to China's economic growth for long-term development. In the process of supply-side structural reform, industrial structure transformation and upgrading is an important task of reform, and the current industrial structure reform must pay attention to the integration of industry and city. Therefore, the research on the development of the integration of industry and city provides more path choices for the reform of industrial structure to pay more attention to the integration of human-centered and city.

Since the reform and opening up, China has implemented the unbalanced development strategy among various regions, resulting in the increasing economic development differences between regions in China. Zhang qizai (2014) found in the comparative advantage theory research based on capacity that there has been an industrial upgrading of wild goose formation in China, and the eastern region is transferring industries to the central and western regions. While upgrading its own industry, the western region should also accept the transfer of industries eliminated in the eastern region. In the process of industrial selection, it should not only consider the industrial value brought by the industry, but also consider which industries can be better integrated with

the urban development of the region. Only in this way can the industry and the town promote each other's development. The integration of industry and city has become an important factor in the selection of transfer industry.

The study of industrial integration in this paper is to first establish a comprehensive, scientific and complete evaluation system for city and industry integration, and use the improved mutation series method (namely the combination method of principal component analysis and mutation series) to measure the development status of the integration of middle city in the process of new urbanization development of xi 'an. Then, a hierarchical evaluation system was established to evaluate the integrated development of xi 'an. Finally, the paper analyzes the problems in the process of xi 'an city and puts forward some policy Suggestions to promote the development of xi 'an city and industry.

2. Design of Production and City Fusion Evaluation Model

1) Design of industrial and urban integration evaluation index system

Although the construction of the production and city integration system is constructed from two aspects of industrial development level and urbanization development level, the indicator system contains three elements of the human-centered production and city integration, namely the integration of industrial structure, spatial structure and social structure. The established index system of city and industry integration fully measures the level of regional city and industry integration development under the background of new urbanization construction.

Table 1 Shows the indicator system of product and city fusion after processing

The target layer	Rule layer	Index layer	Elements layer	unit	Index attribute
Integration degree of production and city	Industrial development level	Industrial scale	Regional GDP	One hundred million yuan	is
			Industrial added value above the scale	Ten thousand yuan	is
		Industrial structure optimization	Broad industrial index	%	is
			Third industry contribution rate	%	is
		Quality of industrial development	The second industry output value proportion	%	is
			Per capita regional GDP	People/one hundred million yuan	is
	Urbanization level	Population urbanization	Urbanization rate of permanent population	%	is
			The population density	Person/square kilometer	is
			Urban and rural income	yuan	is
		The quality of life	The proportion of urban employees in the whole society	%	is
			The public service	Urban per capita road area	Square meters
		Ten thousand people have teachers		A/ten thousand	is
		The living environment	Sewage treatment rate	%	is
			Green coverage of built-up area	%	is

In table 3, in order to reduce the mutual influence of multiple factors, the principal component analysis is carried out and a new indicator system of production and city integration is deleted. According to the correlation matrix of the index, the correlation among the indexes is judged. The importance of the indicators was ranked according to the contribution rate. Criterion layer: industrial development level > urbanization level; Indicator level: industrial scale > industrial structure optimization > industrial development quality, population urbanization > life quality > public service > living environment; The importance of the index of factor layer is

ranked first and second in importance in the table.

2) The demonstration process of the mutagenesis series
a) Index level index importance ranking and numerical calculation

Take relevant data of xi 'an city in 2015 as an example, rank the importance of the standardized dimensionless data and calculate them according to the normalization. Year by year calculation, table 4 only shows the calculation process in 2015.

Table 2 index layer synthesis data processing process

Index layer	Index of factor layer	The original value	Standardized values	The normalized	Describe the index value
industry The size of the	Regional GDP	5801.2	1	$1 = 1^{(1/2)}$	Complementary : $(1+0.970)/2=0.985$
	Industrial added value above the scale	1376.72	0.912	$0.970 = 0.912^{(1/3)}$	
Industry" Structure optimization	Broad industrial index	87.90	0.972	$0.986 = 0.972^{(1/2)}$	Complementary : $(0.986+1)/2=0.997$
	Third industry contribution rate	69.7	1	$1 = 1^{(1/3)}$	
An industry Show the quality	Per capita regional GDP	66938	1	$1 = 1^{(1/2)}$	Non-complementary: $\min(1,0)=0$
	The second industry output value proportion	36.65	0	$0 = 0^{(1/3)}$	
Population of the city The town,	Urbanization rate of permanent population	66.98	1	$1 = 1^{(1/2)}$	Complementary : $(1+1)/2=1$
	The population density	808	1	$1 = 1^{(1/3)}$	
life The quality of	Urban and rural income	20692	1	$1 = 1^{(1/2)}$	Complementary : $(1+1)/2=1$
	The proportion of urban employees in the whole society	62.05	1	$1 = 1^{(1/3)}$	
public service	Urban per capita road area	18.3	1	$1 = 1^{(1/2)}$	Complementary : $(1+1)/2=1$
	Ten thousand people have teachers	3.3	1	$1 = 1^{(1/3)}$	
life The environment	Sewage treatment rate	91.85	0.990	$0.995 = 0.988^{(1/2)}$	Complementary : $(1+0.995)/2=0.998$
	Green coverage of built-up area	42.04	1	$1 = 1^{(1/3)}$	

b) Ranking and numerical calculation of the index importance of the criterion layer

After the index layer index is obtained through calculation, KMO test is conducted on the sample data of the index layer. The KMO value of the sample data over the years is all greater than or equal to 0.7, which is in line with the

condition of principal component analysis. Principal component analysis is conducted on the sample data, and the importance ranking and correlation judgment are made on the index layer index. The data processing of quasi-layer indicators is shown in table 5.

Table 5: Data processing process of criteria layer index synthesis

Rule layer	Index layer	The initial value	The normalized	Comprehensive evaluation
Industrial development level	Industrial scale	0.985	$0.992 = 0.985^{(1/2)}$	Complementary type : $(0.992+0.998+0)/3=0.663$
	Industrial structure optimization	0.993	$0.998 = 0.993^{(1/3)}$	
	Quality of industrial development	0	$0 = 0^{(1/4)}$	
Urban development level	Population urbanization	1	$1 = 1^{(1/2)}$	Complementary : $(1+1+0.964+0.999)/4=0.991$
	The quality of life	1	$1 = 1^{(1/3)}$	
	The public service	0.863	$0.964 = 0.863^{(1/4)}$	
	The living environment	0.994	$0.999 = 0.994^{(1/5)}$	

c) Measurement results of production and city integration

The index of city and industry integration degree is synthesized by the calculation of mutation series of the

indexes of industrial development level and urban development level. The calculation process is shown in table 6.

Table 6: Data processing process of target layer index synthesis

The target layer	Index layer	The initial value	The normalized	Comprehensive evaluation
Integration degree of production and city	Industrial development level	0.664	$0.815 = 0.664^{(1/2)}$	Complementary : $(0.815+1)/2=0.9075$
	Level of urban development	1	$1 = 1^{(1/3)}$	

The index layer index is synthesized by the index layer index, then the index layer index is synthesized by the index layer index, and finally, the convergence degree of production and city is calculated by the criterion layer index. According to the 2015 xi 'an city production and city fusion measurement, the above process can be repeated to obtain the integration degree of xi 'an city production and city from 2000 to 2015. The integration degree of xi 'an city from 2000 to 2015 was calculated as: 0.350, 0.785, 0.847, 0.852, 0.887, 0.901, 0.909, 0.934, 0.947, 0.958, 0.964, 0.974, 0.980, 0.983, 0.987 and 0.907.

3. Result Analysis

a) Analyze the industry and city integration from the level of industrial integration measurement

In the analysis of the integration development level of xi 'an city, first of all, we constructed a level evaluation system for the integration development level of xi 'an city and evaluated the integration development level of xi 'an city. The rating system is established as follows: if the comprehensive evaluation value of city and industry integration is, it is considered to be a high-level city and industry integration; $\in [0.9,1]$ If the comprehensive evaluation value of city and industry integration, it is considered to be a medium level city and industry integration; $\in [0.8,0.9]$ If the comprehensive evaluation value of city and industry integration, it is considered to be a general level of city and industry integration; $\in [0.7,0.8]$ If the comprehensive evaluation value of city and industry integration is, it is considered as low level of city and industry integration. $\in [0.0,0.7]$

According to the empirical data of industrial city fusion in xi

'an, the comprehensive evaluation value of industrial city fusion in xi 'an in 2000 was 0.350 less than 0.7, which is a low level of industrial city fusion. The development of industrial city integration in xi 'an is in its infancy. In 2001, the comprehensive evaluation value of industrial city integration in xi 'an was 0.785, which is a general level. Compared with 2000, the degree of industrial city integration has been greatly improved. From 2002 to 2004, the comprehensive evaluation value of industrial and urban integration in xi 'an was between 0.7 and 0.8, which was of medium level. Since 2005, the comprehensive evaluation value of the city of xi 'an has been higher than 0.9. In the analysis of the level and level of industrial integration in xi 'an city, the industrial integration in xi 'an city has gone through a process of continuous improvement from low grade to high grade. At present, the production and city integration of xi 'an is at a high level.

4. Policy Suggestions

Adhering to the people-centered approach, the integration of industries and cities and the new type of urbanization promote each other's development.

In the process of promoting new-type urbanization, the development of xi 'an "industry and city integration" is to improve the quality on the basis of adhering to the people-centered approach. Human development is the core of the integrated development of industry and city because "human" is both an important input factor of industrial development and a necessary demand for urban functions. In terms of urban development, to improve quality means to develop people-oriented, build smart cities, and improve the happiness index of urban residents and the carrying capacity of cities. In terms of industrial development, improving quality means that industrial clusters pursue industrial organization and high-tech innovation, save energy, reduce waste and ecological development, and stick to the path of innovative and sustainable development. New towns provide

new ideas for urban development and industrial development, which greatly promotes the improvement of urban integration.

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