The Interactive Influence of Urbanization, land Price and Industrial Structure Adjustment——the Empirical Analysis from China[1]

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Abstract

Urbanization and industrial structure adjustment is the main engine of China's economic growth under the new normal. As a production factor, land is an important variable for both urbanization and industrial structure adjustment and can't be neglected. There are mutual promotion and interaction relation among three variables. Making clear the complicated relations and achieving a positive interaction have theoretical research value as well as practical significance. Based on the panel date as of Chinese 31 provinces from 1998 to 2012, this pape analyses the influence mechanism among urbanization, land price and industrial structure adjustment, and applies empirical analysis with panel VAR model. The results show there are significant differences in interaction path of urbanization, land price and industrial structure among three regions of east, west and midland of China. According to conclusions, this paper provides policy proposals for regions to formulate policies about urbanization, land price and industrial structure adjustment in line with their economic characteristics and development phases.

Keywords: Industrial Structure Rationalization; Industrial Structure Upgrading; Land Prices; Urbanization; Panel VAR Model

JEL: L50, R58, O18

1. Introduction

The Chinese rapid economic growth since 1978 has ended with the impact of 2008 financial crisis and China's own economic development stage, Chinese economic development faces 'the new normal'. No matter now or in the future, it's the principal problems for China's economy that the pattern transformation of economic development and the mechanism reconstitution of economic growth driving.

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Undoubtedly, urbanization and industrial structure adjustment will be the main engine of China's economic growth. The urbanization level in 2012 reached 52.6%, it means cities have become important carriers for China's economic and social development, and China has entered a growth stage which is strongly city oriented. The increasingly fast urbanization process has promoted the stable adjustment of industrial structure, meanwhile, the price of land rises during urbanization and industrial structure adjustment. Throughout the development of developed countries, we found that during economic development, urbanization and industrial adjustment are important driving forces with an inseparable relationship. In the transition process of leading industry from agriculture to industry and modern services, industrial structure shows a continuous agglomeration of industry and modern services in space structure, and this has promoted urbanization. But rising of land price is due to the finiteness of urban development space and the immobility and non-renewable of land, and it will react to urbanization and industrial structure adjustment. Because of the regional economic imbalance within China and implementation of giving priority to the development of heavy industry, there are obvious gaps in urbanization level, land price and industrial structure adjustment among east, west and midland of China and urbanization level lags behind industrialization advancement severely. For these reasons, comprehensively surveying and analysing on interaction relations among urbanization, land price and industrial structure adjustment will contribute significant research value to a healthy and sustainable development of China's economy.

2. Literature Review

Simon Smith Kuznets and H. Chenery focused on urbanization process affected by the industrial structure evolution. Hereafter, many scholars did a lot of theoretical and empirical works on interaction relations between industrial structure and urbanization. In recent years, there were representative researchers who concentrated on influence mechanism between industrial structure and urbanization, such as Black & Henderson (1999) who found human capital was the bridge between change of industrial structure and urbanization [1], Murata (2002) who worked on the effect of technical progress on industrial structure evolution and urbanization [2],Davis & Henderson (2003) who inquired into the important role of agglomeration economy playing in the interaction between urbanization and industrial structure [3],and Glaeser (2005) who considered it was good to adapt urbanization to industrial structure [4].Empirical analyses about interaction relations between urbanization and industrial structure were more comprehensive and elaborate, overall, the present researches have switched from those test and verify about the correlativity between urbanization level and industrial structure upgrading (A. Gilbert and J. Gugler, 1982; Moomaw & Shatter 1996 et al.) [5] to these focus on the interactive development differences between tertiary industries and urbanization as well as its effect on economic growth (Yoshima Araki, 1997; Henderson, 2002; Hermelin, 2007 et al.) [6][7]. The situation overseas is that many scholars have studied land price, land structure and urban spatial development after the establishment of location theory by Johann Thünen and Max Weber, for example, R. V. Ratchliffe presented a relatively complete urban land-use economic model in 1949; based on this, William Alonso introduced the mono-centric city model (AMM) in 1964; combined agglomeration economy of companies , Fujita and Ogawa developed and perfected AMM model in 1982; Kiss laid special stress on analyzing the vital role of industrial restructuring in industrial space structure, urban space and land-use [9].

Extensive researches about the relation between urbanization and industrial structure adjustment have been made in China since 2000. The key point has been shifted from theoretical researches on the interactive mechanism between urbanization and industrial structure evolution to empirical tests on the interactive relation. There are several representative researches: Gan Chunhui et al. (2003) consider the acceleration of urbanization plays very apparent role in optimizing primary industry, upgrading secondary industry and promoting tertiary industry [10]; Li Tieli et al. (2003) studied the effect of industrial structure evolution on urbanization from the perspective of resources transfer in industrial sectors and spaces [11]; Chen Liuqin (2005) analyzed the driving forces of urbanization in the view of industrial structure transfer and development [12]; Zeng Guoping et al. (2008) found there exists a causal relationship between service industry development and urbanization in eastern China in long term. Service industry development leads to urbanization in a long period, but the other way around, service industry in the west is weakly correlated with urbanization [13]; Li Chenggu et al. (2009) applied variance analysis to changes of interaction relations between urbanization and industrial structure in northeast China [14]; Chen Lijun et al.

(2010) worked on the relation between urbanization and industrial structure, and suggested policy proposals about coordinative development of urbanization and industrial structure on the basis of comparison within countries [15]; Cheng Jin et al. (2012) studied the predicament and breakthrough direction of industrial upgrading in new town against a background of new urbanization and took Ji Mei district of Xiamen for example [16]. The main studies on the relation among land price and urbanization as well as industrial structure are: Gao Linyuan et al. (2004) analyzed the fluctuant tendency of rent and land price during urban sprawl under the static model and dynamic model [17]; Guo Zhiyong (2013) made a intensive study on the inherent law of land increment during urbanization [18]; Wang Deqi (2013) shows that land price obviously have impelled the adjustment of urban economy structure from secondary industry to tertiary industry [19]; Wang Jun et al.'s emprical shows urban land price rise significantly promoted the urban economic structure from the second industry to tertiary industry adjustment. Moreover, the specific impact and interaction relation between industrial land price of urban agglomeration and industrial structure upgrading are systematically researched by Zhou Xia (2013) [21]. On the whole, scholars at home and abroad have done masses of useful work about the interaction relation of urbanization and industrial structure adjustment, but there is a few researches on it which include land price. In basic research methods about this topic, more scholars used panel datas of ordinary regression analysis or VAR analysis with time series data, with less of VAR with panel datas analysis. Based on the theoretical analysis of interaction mechanism among urbanization, land price and industrial structure adjustment, according to the panel datas in 30 provinces (except for Tibet) of China rom 1998 to 2012, this paper adopts relatively new panel VAR measuring skill, panel VAR model and impulse response function to simulate the interaction path of the three, estimates interaction relations in the west, east and midland of China, and provides some enlightenments and references for policy-making about urbanization and industrial structure adjustment.

3. The Interactive Mechanism of Urbanization, Land Price and Industrial Structure Adjustment

Based on William Petty's work, Clark produced industrial structure evolution theory which has been widely confirmed in the economic development among countries: there are different industrial structure features in different countries or regions by horizontal contrast; but there is an objective law that the transition of industrial structure will transfer from agriculture to industry, and to service during economic development and income growth by vertical contrast. Owing to inherent consistencies between industrial structure evolution and economic development, the existing economic theories are particularly about the effect of structural transition on economic growth, and structural transition is also regarded as an intrinsic characteristic, while space factors of economic growth are neglected. As new economic geography and urban economics have developed, the effect of space factors on economic activities has become more prevalent and profound. And the center of activities have been changed from rural area to urban area with the transition of industrial structure from agriculture to service. Nowadays urban area is becoming the most common and important carrier of economic activities in spatial organization. Broadly speaking, industrial structure adjustment and urbanization can be seen as dimensions of time and space of economic activities, the former one is the core power to promote urban development, while the later one is the spatial support of industrial structure adjustment. The interactive development of the two is the primary coverage of modern economic growth. Land is an important production factor and also a carrier of urban economy, the fluctuation of its price could influence importantly industrial structure adjustment and urbanization. On the basis of past two transitions of industrial structure adjustment, this paper will discuss the interaction mechanism among industrial structure adjustment, urbanization and land price more clearly.

3.1 The Scope and Sprawl of Urbanization are determined by Industrialization during the Transition of Industrial Structure from Agriculture to Secondary Industry

The transition of industrial structure from agriculture to the secondary industry (the first transition of industry structure) is usually called industrialization. This could be explained by Lewis model. He thought there is a dualistic structure of traditional agricultural sector and modern industry sector in a region, because wages in traditional department is lower than modern department, labor force will move from traditional to modern department until there is the same wage in both of them [22]. The formation and rapid development of urban is the direct result of pursing large scale and professionalization in the process of industrialization. So to speak, industrialization is the primary motivation of urbanization and urbanization is the outcome of industrialization. Along with industrialization, urban, which has gathered manpower, capital and material resources together, provided great spaces for industrial adjustment and upgrading.

As industrialization into the middle, the accelerated development of urbanization will drive the industrial structure from labor-intensive to capital and technology intensive evolution. During the process mentioned above, there was a large demand for industrial land and town site as the industrial acceleration and labor shifting from agriculture to industry, and these have resulted in rapid rise in land price. Although the cost of industrialization and urbanization has risen, it seems that for enterprises and worker not untill the rising cost which is caused by land exceeds the benefit of urban agglomeration economy can economic activities in industry stop drift toward urban and urban suspend its expansion. On the whole, during the first transition of industrial structure from agriculture to industry, the wage difference between the two sectors has caused the transfer of large amounts of labor forces and resources from agriculture to industry, and the corresponding economic activity center has changed from rural to urban. Although land price began to rise during this process, it placed less restrictions on urban sprawl, because urbanization in China is seriously lag behind industrialization, and there is a higher stock of land, the amount and scale of cities have developed rapidly under the promotion of industrialization.

3.2 Land Price will Promote Industrial Structure Adjustment within the city with the Transition of Industrial Structure from Secondary to Tertiary

In the maturity stage of industrialization (both the proportion of output and employment structure of secondary industry have reached 40% or so), the slow development of industrialization is caused by the rising proportion of organic composition of capital and the weakness in absorbing labor forces of secondary industry. In this stage, urbanization mainly depends on the development of service industry and emerging industies, which would improve infrastructure and living standard. Because special switching of economic centre is excluded in this stage, the study on the secondary transition of industrial structure will base on the change of land price. Detailed analyses are these: there is a limited space for urban development because of the immobility and non-renewable of land. Enterprises and workers may not only benefit from agglomeration economy in urban area, bus also face the rising cost pressure of producing and living, which is caused by rapid rise in land price. There is a difference in sensitivity to land price between secondary industry and tertiary industry. Production in secondary industry is based on standardization and large scale, so that there is a larger reliance on land scale but a low demand for external benefit made by urban agglomeration economy (mainly refers to transaction cost saving and rapid spread of technology and knowledge etc.). On the contrary, tertiary industry, especially some burgeoning services, depends heavily on the external benefit, while having a little dependency on land scale, in addition, the added-value in modern service is higher than that in industry, the sensitivity of industry and service to the land price will become more difference. Under the circumstances that urban scale remains basically unchanged and land price reaches a critical value, benefit of urban agglomeration economy can't compensate for the rising cost of land price, which leads to relocation or upgrading of industry. While labor forces and other resources can't move out entirely with industry sector. Resources released from traditional industry have furthered the development of urban tertiary industry and led the transition of industrial structure in urban to secondary sector of service oriented. When urban scale achieves a basically stable situation, low added-value industry will be taken away from city while the high added-value will be facilitated by the rapid rise in land price, the continuous upgrading in industrial structure will also improve the development quality of urbanization.

Concrete relations among urbanization, land price and industrial structure see below

Figure 1: The Interaction Relations among Industrial Structure Adjustment, Urbanization and Land Price

4. The Measurement and Characteristics Description of Variable

4.1 The Measurement of Variables

Urbanization is a historical process for society transfer from traditional one of agriculture-oriented to modern one based on industry and service. This includes changes of employment, the transition of industrial adjustment, the alternation of land and regional spatial layout. Because population urbanization is an important part of urbanization, the proportion of urban population of a country or a region in total population can be used as a measurement for urbanization level, which is a kind of common index of population share.

Due to the variable statistical range and great mobility in urban population, this paper uses the proportion of urban household register in the total population at the end of the year as urbanization level, we denote it as Urb. Industrial structure adjustment mainly includes upgrading and rationalization. Upgrading is based on rationalization; both of them are basic points to realize optimization and upgrading of industrial structure. For this, the general analysis on the relation between industrial structure adjustment and urbanization in this paper will be done from the perspective of rationalization and upgrading. Upgrading is a changing process from a lower pattern to an advanced one and it abides by general industrial structure evolution rules. As economic development, primary industry proportion falls while secondary and tertiary industry increase. Based on this rule, this paper adopts the proportion of non-agriculture output in gross output to measure the upgrading of industrial structure, we denote it as Inu. According to the economic development stage, technical level, consumption structure, resource condition and so on, industrial structure rationalization means adjusting unreasonable parts in industrial structure and optimizing the allocation of resources, which finally lead to a coordinate development among industries. Industrial structure deviation degree is used commonly to measure the rationalization level of industrial structure. The larger the industrial structure deviates, the more unreasonable it becomes. This paper uses study from Gan Chunhui (2011) for reference, rationalization is calculated by formula as follow:

$$Ino = \sum_{i=1}^{3} \left(\frac{y_i}{y} \right) \ln \left(\frac{y_i l}{y l_i} \right)$$

ino is rationalization level of industrial structure, y is output value, l is employment, i is industry [23]. Researches from Kuznet, Chenery, et al presented that each industry has the same productivity when industrial structure is reasonable, this means $y_i / y = l_i / l$ or $y_i / l_i = y / l$, and $Ino = 0$ .if $Ino \neq 0$, it shows a unreasonable industrial structure, the nearer the Ino approximate to zero, the more reasonable it presents. Land price mainly refers to the buying price for land right and expected revenue. Owing to its state-owned nature, land price in China can be seen as the total discount of one-time payment of rental. Because there are many statistical indicators, land price in this paper mainly depends on the situation of state land supply. The selling price of land is divided by selling acreage, and then it will be processed by indexation. We denote it by Ladp.

4.2 Descriptive Statistics Characteristics of Variable

At first, an elementary descriptive analysis was conducted on the related data of east, west and midland of China range from 1998 to 2012; the result initiates us into the evolution characters of urbanization, land price and industrial structure adjustment.

Table 1: Descriptive Characteristics of Indexes in east, west and Midland of China 1998-2012

Region	statistics	Urbanization (urb)	Industrial structure upgrading (inu)	Land price (ladp)
West	maximum	0.288	0.874	6.180
	Average value	0.254	0.820	4.935
	Average annual growth rate	0.010	0.090	0.122
midland	Maximum	0.326	0.879	6.517
	Average value	0.305	0.833	5.341
	Average annual growth rate	0.091	0.088	0.136
East	Maximum	0.513	0.924	7.264
	Average value	0.451	0.894	5.960
	Average annual growth rate	0.106	0.083	0.118

Note: this chart is calculated by author with the related data.

We can learn some basic situations of urbanization, land price and industrial structure adjustment in west, east and midland of China from maximum and average value. The level of urbanization, land price and industrial structure upgrading of eastern region are obviously higher than those of the western region.

From the perspective of average annual growth rate of each index, as the implementation of the stragety of Western Development and Promoting Midland to Rise, gap among west, midland and east is narrowing. West, east and midland, as it were, represent different phase of urbanization and industrial structure upgrading. So, what are the concrete interaction relations among the three? Is there a large difference in the direction and path of impact for industrial structure and urbanization among three regions? These need to be verified by empirical analysis.

5. The Empirical Analysis

5.1 Model Specification

As we mentioned above, relations among urbanization, land price and industrial structure are't unidirectional but interactive. This paper conducts empirical analysis with panel VAR model, which is suitable for endogenous relations and introduced by Holtz-Eakin in 1988, based on VAR model of Sims. Panel VAR model had been perfected by many scholars in practice and become a ripe model with time sequence and panel data. The panel VAR model, which was presented by Inessa Love (2006) from World Bank, helps this paper directly [24]. The model this paper builts is as follow:

$$y_{it} = \alpha_i + K_n y_{it-n} + \xi_{it}$$

$y = [Urb \quad Inu \quad Ino \quad Ladp]'$, i is province, t is year, n is lag period.

5.2 The Data Sources

Land price comes from China Land and Resources Statistical Year Book, urbanization comes from China Population Statistical Year Book. Industrial structure upgrading and rationalization are calculated by author with related index from China Economy Web. The data processing and econometric analysis in this paper are conducted with soft stata12.0.

5.3 Stationarity Test

Data stationarity in this paper is tested by LLC panel unit root test. Results are shown in table 2, both of them are stationary.

Table 2: Stationary test for Variable

Variable	Statistic t after adjustment	P value	stationarity
Urb	-5.1091	0.0000	Stationary
Ladp	-2.6816	0.0037	Stationary
Inu	-6.2900	0.0000	Stationary
Ino	-4.1025	0.0000	Stationary

5.4 The Empirical Test

At first, we construct panel VAR model (PVAR) based on data from nationwide and east, west and midland of China and test it with Granger causality test to learn about concrete transmission relation and time-lag among the three. According to this, this paper can conclude the concrete path of impulse response from the construction of impulse response function and variance decomposition.

5.4.1 Analysis based on PVAR

At first, we should judge autoregressive lag order of data from nationwide and east, west and midland of China with AIC and SIC norm, choice criteria is labeled with *. Results are shown in table 3.

Table 3: Lag Phase of Nationwide and the three Regions

Lag	nationwide		east		midland		west	
period	AIC	SIC	AIC	SIC	AIC	SIC	AIC	SIC
1	-9.06251	-7.59443	-10.4052	-9.09479	-14.0424	-12.7602	-10.5776	-9.26727
2	-10.9544	-9.20447	-8.63349	-6.87746	-14.5947	-12.793	-10.1426	-8.38658
3	-12.9402	-10.2819	-11.4803	-9.22174	-14.4472	-12.0651	-11.8989*	-9.64033*
4	-13.1705	-10.7182	-9.09143	-6.26039	-14.9893*	-11.9538	-11.8715	-9.04041
5	-13.1824*	-10.8661*	-14.0385*	-10.5477*	38.3601	42.1381	-11.5176	-8.02684

Notes:* means the significance level at 10%。

According to the test for data from nationwide and east, west and midland of China and the significance of regression coefficient, we can construct PVAR(5), PVAR(4) and PVAR(3) separately. By analyzing the equation of model, the interactive relation and direction of the three can be concluded respectively. This paper will write out the positive-negative of influence coefficient of variables instead of equations of PVARs in light of length limitation of paper.

Results of table 4 show that:

At first, the relation between urbanization and land price: there is a positive relation between urbanization and land price in nationwide and east, west and midland of China, land price will rise as increasing of urbanization level. This also means urbanization in China is driven by government, because the higher the land price, the more government receipts it can get, and more driving force for urbanization.

Table 4: The Direction of Influence Coefficient among Major Variables of Pvars

variable	nationwide	east	midland	west
Urb and Ladp	positive	positive	positive	positive
Urb and Inu	positive	negative	positive	negative
Urb and Ino	positive	positive	negative	negative
Ladp and Inu	negative	negative	negative	positive

The second, the relation between urbanization and industrial structure upgrading: there is a negative relation between industrial structure upgrading and urbanization both in east (an area with higher level of urbanization and industrial structure upgrading) and west (an area with lower level of urbanization and industrial structure upgrading), on the contrary, there is a positive interaction in midland (an area with secondary level of urbanization and industrial structure upgrading). The third, the relation between urbanization and industrial structure rationalization: for nationwide and east area, industrial structure rationalization can promote urbanization, vice versa; but in midland and west, there is a larger gap among industries productivity, in addition, production factors in west and midland cannot flow entirely for the lower marketization, therefore, no positive interaction has been achieved between urbanization and industrial structure ratioinalization. The forth, the relation between land price and industrial structure upgrading: land price in nationwide, east and west is rising so fast that the cost of industry development has been increased, especially in manufacture, this is not good for industrial structure upgrading; while land price in west shows a opposite situation, reasonable rising of land price will improve resource price distortion, allocation efficiency and industrial structure upgrading.

5.4.2 Causality Test

By conducting the Granger causality test on major variables of four PVAR model, the result shows Granger causality between Urb and Ladp only exists in nationwide and east; Granger causality between Urb and Inu only exists in west and midland; and Granger causality between Urb and Ino only exists in midland; while there is no Granger causality between ladp and Inu.

Table 5: Results of Granger Causality Test on Major Variables of PVARs

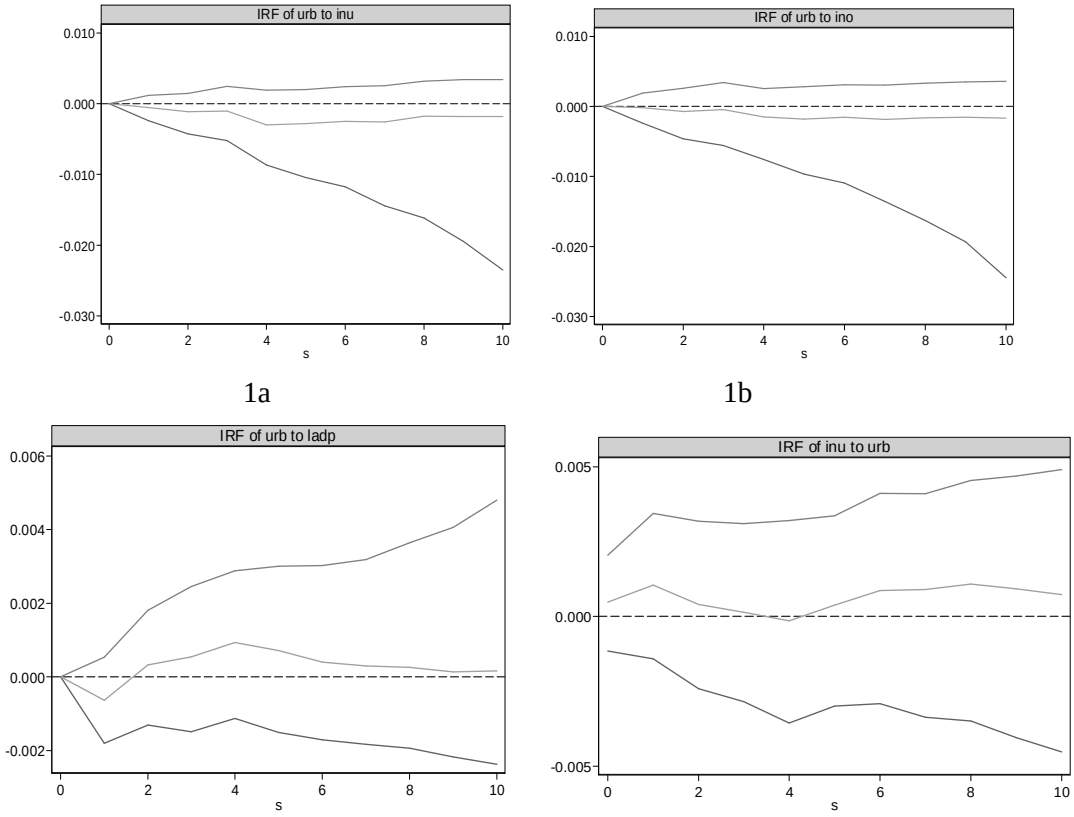
Variable	nationwide	east	Midland	west
Urb and Ladp	Granger causality	Granger causality	-	-
Urb and Inu	-	-	Granger causality	Granger causality
Urb and Ino	-	-	Granger causality	-
Ladp and Inu	-	-	-	-

Note: - stands for no Granger causality

Further explanation of the result is as follow: the first, urbanization is the Granger-cause of land price fluctuation in east and nationwide, it shows that urbanization has a remarkable effect on rising of land price; the second, urbanization is the Granger-cause of industrial structure upgrading in west and midland, which demonstrates that urbanization has a remarkable effect on industrial structure upgrading in area with lower urbanization level, on the contrary, urbanization has little effect on industrial structure upgrading in area with higher urbanization level. The third, urbanization is the Granger-cause of industrial structure rationalization in midland, which illustrates that intermediate stage of urbanization is the optimal period for industrial structure rationalization, the closer the relation between industrial structure rationalization and urbanization the more effective its interaction.

5.4.3 Impulse Response Function Analysis and Variance Decomposition

The dynamic path characters can be further depicted by impulse response analysis. This paper just provides the impulse response function simulated by Monte—Carlo at confidence interval of 90%. The impulse response charts of impact from urbanization on industrial upgrading, rationalization, land price as well as the impact from industrial structure upgrading on urbanization, which are calculated by data from nationwide, are noted by 1a, 1b, 1c and 1d respectively.



1a 1b

1c 1d

Chart 1: Impulse Responses among Important Variables

According to 1a and 1d we can see it is negative that impulse response of the impact from urbanization on industrial structure upgrading, while it is positive that impact from industrial structure upgrading on urbanization; from 1b and 1c we can know that impulse response of impact from urbanization on industrial structure rationalization is negative, while it shows positive on land price. Because of the inherent consistencies between variance decomposition and impulse response function, this paper will give the results table of variance decomposition of east, west and midland of China instead of the concrete impulse response chart. The variance decomposition results of related variables in the three regions at stage 5 and stage 10 are shown in table 6. The results show that:

Table 6: Variance Decomposition Results of PVAR Model in East, West and Midland of China

region	Dependent	s	Urb	Inu	Ino	Ladp
east	Urb	5	0.839	0.009	0.148	0.004
	Inu	5	0.060	0.655	0.280	0.004
	Ino	5	0.367	0.219	0.401	0.013
	Ladp	5	0.120	0.302	0.124	0.453
	Urb	10	0.814	0.019	0.161	0.007
	Inu	10	0.123	0.583	0.289	0.005
	Ino	10	0.341	0.260	0.373	0.025
	Ladp	10	0.176	0.293	0.190	0.341
midland	Urb	5	0.806	0.136	0.011	0.047
	Inu	5	0.314	0.563	0.112	0.010
	Ino	5	0.333	0.115	0.545	0.006
	Ladp	5	0.140	0.043	0.013	0.804
	Urb	10	0.785	0.147	0.017	0.051
	Inu	10	0.420	0.460	0.108	0.012
	Ino	10	0.390	0.111	0.486	0.013
	Ladp	10	0.193	0.053	0.036	0.718
west	Urb	5	0.758	0.225	0.006	0.012
	Inu	5	0.032	0.831	0.108	0.028
	Ino	5	0.112	0.359	0.425	0.105
	Ladp	5	0.269	0.388	0.001	0.341
	Urb	10	0.463	0.478	0.005	0.053
	Inu	10	0.134	0.719	0.120	0.027
	Ino	10	0.386	0.333	0.210	0.070
	Ladp	10	0.217	0.587	0.001	0.195

Firstly, urbanization has the highest cumulative effect on itself while a higher cumulative effect on land price, it will get stronger as time goes on and shows a weaker effect in east compared to west, impact of stage 10 on land price in west reached 0.217. It mainly because there is a higher urbanization level in eastern part, on the contrary, land price in western part, which with a lower urbanization level, has been effected more by urbanization acceleration. Secondly, industrial structure upgrading has the highest cumulative effect on itself and it has a big impact on land price in eastern part. Results at stage 5 and stage 10 are 0.302 and 0.293 respectively, while industrial structure upgrading mainly effect on urbanization and land price in western area. Results at stage 10 are 0.478 and 0.587 respectively, which shows there is a great effect on land price during industrialization acceleration and urbanization in west. Thirdly, industrial structure rationalization mainly embodied with the impact on urbanization and industrial structure upgrading in eastern part, it means eastern part has gone into the stage of intensive urbanization and industry development, and it can realize a better interaction between industrial structure upgrading and urbanization. The forth, land price mainly embodied with the cumulative effect on itself, and it affects industrial structure rationalization in east and west and urbanization in midland a lots, while it has a little impact on other variables, effect on urbanization of this three regions will get stronger as time goes on.

6. Conclusion and Policy Suggestions

6.1 Conclusion

The empirical analysis shows that there is a great difference in interaction path of urbanization, land price and industrial structure between east, west and midland, and it shows as follow: The first, there is a positive relation between land price and urbanization in both of the three regions, and there is a different influence direction among major other variables, for example, relation between urbanization and industrial structure upgrading in midland shows positive while shows negative in east and west, relation between land price and industrial structure upgrading in east and midland shows negative but shows positive in west. The second, urbanization is the Granger-cause of industrial structure rationalization only in midland. Meanwhile, urbanization is the Granger-cause of industrial structure upgrading. Urbanization is the Granger-cause of land price fluctuation only in east.

The third, urbanization has the highest cumulative effect on itself and a higher cumulative effect on land price and shows a weaker effect in east compared to west. Industrial structure upgrading has the greatest cumulative effect on itself; besides, the major impact it made was on land price in east and also urbanization and land price in west. Land price mainly embodied with the cumulative effect on itself, but it has a little effect on other variables, it affects industrial structure rationalization in east and west and urbanization in midland a lots. The effect on urbanization in the three regions will get stronger as time goes on.

6.2 Policy Suggestion

At first, time sequence of inner level in secondary industry and tertiary industry should be mastered reasonably by government, positive interaction between industrial structure and urbanization should be realized while making policy for industrial structure adjustment promoting. The vicarious function of production factors like capital, technology to labor force is becoming increasingly clear with industrial structure upgrading and evolution, and this is not good for labor shifting from rural to urban. Especially, considering the unbalanced economic development in China, if we blindly pursue industrial structure upgrading, it may hinder or restrain urbanization in west with lower urbanization level and industrial structure level. Therefore, we should formulate a proper industry proportion of labor intensive, capital intensive and skill intensive between secondary and tertiary industry, and realize industrial structure upgrading step by step. At the same time, more attention should be paid on industrial structure rationalization upgrading, injecting new power into urbanization, improving efficiency of resource allocation and promoting productivity among industries. To a certain extent this will offset the indirect negative effect, such as industry hollowing made by industrial structure upgrading to urbanization.

In the next place, each region should suit its measure to local conditions while making policies for land price regulation so that urbanization and industrial structure adjustment can be better improved. According to the analysis above, we can see the differences and unbalance of urbanization level, land price and upgrading and rationalization of industrial structure between different places obviously. What we should watch out for are that, on the one hand, the price of trade estate is often artificially inflated during urbanization in China, which mainly because urbanization in China is guided by government. Under this situation, land expropriation often conducted with a lower compensation standards, but sale at a higher price so that government can acquire the added-value as the primary income; on the other hand, local government often conducted investment promoting with an artificially low price of industrial land. Both of the two reasons have resulted in land price distortion, the important role of land price is constrained during urbanization and the second industrial structure adjustment, thus industrial structure upgrading in China is slowed down. So, we should focus on the vital function of land price to urbanization and industrial structure adjustment. Land price distortion in western can be released through reasonable land price rising, and the resource allocation efficiency will be also improved, so does urbanization and industrial structure upgrading. For eastern, problems of rapid rising of land price and artificially low industrial land price should be resolved as soon as possible. Traditional industry without comparative advantages in east should be transferred to west or midland in order to improve industrial structure upgrading and quality of urbanization.

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