

Analysis of the Influence of New Industrialization on China's Urban Economic Growth

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Abstract—In recent years, the pace of my country's new industrialization has accelerated significantly, but new industrialization in the new era has new connotations and new characteristics, and it is necessary to accurately grasp and innovate development paths to stimulate more new results. Achieving new industrialization will enhance resource advantages. It is of great significance to transform economic advantages and promote urbanization development.

At present, the government regards the realization of new industrialization as the focus of its work, and the realization of new industrialization has become an important factor in regional economic competitiveness and competitive advantage. Therefore, studying the development of new industrialization in Chinese cities has important practical significance for promoting the sustained, rapid and healthy development of the secondary industry in some cities, improving core competitiveness, and promoting new industrialization. There is a large gap in economic development levels among Chinese cities, as well as a large gap in GDP. But as a highly industrialized country, we are also trying to understand new industrialization technologies and their impact on urban economies and economic development.

The relationship between urbanization, industrialization and economic growth has been widely discussed. This article uses panel regression and linear regression to analyze the dynamic relationship between urbanization, industrialization and new industrialized economic growth in 30 provinces in my country. Additionally, research reveals the benefits of new industrialization. Such as employment, efficiency, environmental protection, etc. By analyzing the impact of industrialization and urbanization on urban economic growth, we can provide predictions and decision support for policymakers, further improve urban economic development, and enhance industrial levels. Industrial Development.

The results show that my country's economic growth will promote the urbanization process in each province, while indicating that the degree of industrialization will inhibit the urbanization process in each province. In other words, the healthy development of urbanization drives the transformation and upgrading of industrialization, which is conducive to the integrated development of cities and industries. However, there are misunderstandings such as "de-industrialization" in my country's theoretical understanding of urbanization, and phenomena such as pseudo-urbanization also exist in practice. Only by grasping the synchronous development relationship between industrialization and urbanization at the intermediate level and properly handling the new requirements of urbanization and industrial development from the new concept of integrated industry-city development can we achieve the integrated development of industry-city. Promote urbanization and industrialization.

Index Terms— New Industrialization, New Urbanization, Economic Growth, Hausman Test

Jel codes: C33, L16, L10

I. INTRODUCTION

From the perspective of the history of world economic development, urbanization, industrialization and their relationship have always been core issues in the development of various countries. Many developed countries, such as the United States, Germany and the United Kingdom, have been committed to promoting the development of industrialization and urbanization throughout their history. After the financial crisis, they implemented a reindustrialization strategy and accelerated the process of urbanization. In their early stages of development, many developing countries, such as China, India and Africa, hoped to transform their own economies through industrialization to achieve national prosperity and people's happiness. Since the reform and opening up, China's economy has developed rapidly and has now become the world's second largest economy after the United States. However, with the development of urbanization and industrialization, a series of problems have also emerged one after another. The contradictions between economy, society,

resources and environment are prominent, such as the disorderly expansion of urbanization. serious damage to the ecological environment, widening gap between urban and rural rich and poor, low level of information on industrial development, low technological content and excessive energy consumption. In order to solve these problems, national leaders timely proposed new industrialization and new urbanization (hereinafter referred to as the two modernizations).

The new industrialization is the industrialization driven by information technology, the industrialization driven by scientific and technological progress, the industrialization centered on improving economic benefits and market competitiveness, the industrialization combined with the implementation of sustainable development strategy, and the industrialization that gives full play to the advantages of China's human resources.

The new type of urbanization is the basic characteristics of urban-rural integration, urban-rural integration, ecological livable and harmonious development of urbanization.

Promote the integration of urban and rural areas, promote rural revitalization, increase farmers' income, and promote the common prosperity of all people through a new type of urbanization that integrates urban and rural development; We will promote the development of city clusters and promote a new type of urbanization with county towns as an important carrier.

II. LITERATURE REVIEW

2.2.1 Literature related to new industrialization

According to the research of Wang Jinrong (2023), the "BIM + industrial building" model has become a key element of the deep integration of information technology and physical buildings in the current construction field, and an important way to realize the development of traditional building industrialization to new building industrialization. It is of great significance to take key measures to promote the development of the construction industry to the direction of high quality. First of all, taking the development level of new building industrialization as the research object, based on the perspective of BIM, the connotation and characteristics of industrialization at home and abroad, traditional building industrialization, new building industrialization, BIM theory and other related literature are studied. Secondly, literature review is used to analyze the literature. Then the preliminary index is selected and optimized by questionnaire survey, and the calculation method and connotation of each evaluation index are expounded. Finally, the development level of the new building industrialization is evaluated, and the scientific rationality of the evaluation model is verified.

Siuntiurenko (2023). It discusses the practical significance and practical significance of the development of the Russian economy in the direction of new industrialization, and analyzes the main determinants of Russian industrial development. He selected the industrial added value and the cost consumption caused by industrialization in the past five years for analysis. Information technology supports the goals and objectives of import substitution, military product conversion, national industry high-tech development and other stages, as well as improving the efficiency of information resource utilization to promote domestic science and technology development. Issues in the industrial sector are being considered. In the end, it was concluded that new industrialization has a milestone significance for the development of Russia, which not only speeds up the speed of industrial development, but also reduces the cost consumption caused by industrialization.

2.2.2 Literature related to new urbanization

According to research by Xu Yaqian (2022), Hebei Province, as a major industrial province, needs to coordinate the relationship between urbanization and industrialization and improve the level of coupling and coordination between the two. Therefore, this article constructs an evaluation index system for the two major systems of new urbanization and

industrial greening. On the basis of analyzing and summarizing relevant references To jointly evaluate the development level of new urbanization and industrial greening in Hebei Province. On the basis of the two major system evaluation index systems, firstly, the entropy method is used to weight each indicator, secondly, the comprehensive development index of each subsystem is calculated according to the formula, and finally, based on the calculated comprehensive development index, Hebei Province and 11 Analyzing the development levels of new urbanization and industrial greening in prefectures and cities, we came to the conclusion that the overall comprehensive level has increased and there are significant differences between cities. and there is a long-term equilibrium relationship between the two.

2.2.3 Related literature on the relationship between new industrialization and new urbanization

Chen Lei (2020) first sorted out the development status of new urbanization and new industrialization in Hubei Province based on the theoretical results of new urbanization, new industrialization and the relationship between the two; secondly, Comprehensively evaluate the index system, and use the entropy weight method to determine the influence weight of each index. With the help of the coupling coordination model of the two elements, the new urbanization level, new industrialization level and the coupling of the two elements in Hubei Province from 2009 to 2018 are analyzed from the spatiotemporal dimension. The development of coordination degree, and then use the prediction model method to predict the development of coupling coordination degree in the next five years. He concluded that (1) overall, the coupling coordination degree of new urbanization and new industrialization in Hubei Province shows a slowly increasing development trend, indicating that the coordination degree of these two elements is constantly affecting and running into each other within the system. Finally, he gave corresponding policy suggestions: boost the construction of new industrialization and promote the development of new urbanization; accelerate the construction of new urbanization and improve the level of new industrialization; strive to promote the coordinated and stable development of new urbanization and new industrialization, so as to achieve high quality in the region development purposes.

III. DATA & METHODOLOGY

3.1 DATA

This paper selects 527 observation of data indicators in 31 provinces from 2005 to 2021. The specific data selection and processing are as follows:

Table 1

Variable	Indicator Selection	Company	Symbol
Industrialization Rate	Industrial GDP/GDP	%	IR
GDP	Per Capita GDP	Yuan	GDP
Urbanization Rate	Urban Population/Total Population	%	CR

For the selection of indicators of urbanization, industrialization and economic growth, the indicators of urbanization in this paper are usually expressed by the population urbanization rate, which is also the statistical indicator in the statistical yearbook. That is, the urbanization rate is the proportion of the urban population to the permanent population. There are many criteria to measure the degree of industrialization of a country. At present, most studies use the ratio of industrial added value to GDP to express the industrialization rate. As for the measurement of economic growth, the per capita GDP can reflect the economic development level of a country or region more truly, so the article selects the per capita GDP as the indicator of economic growth. In addition, since the value of GDP per capita is large, it is logarithmic.

3.2 Methodology

This article chooses to use panel regression. The so-called panel data refers to the data of an individual in a certain period of time. It includes not only n cross-sectional individuals, but also the T -period longitudinal time series dimension. Panel data model is to systematically explore the differences and changes between different individuals from two aspects of individual dimension and time series dimension, and present more information. In addition, building panel data can increase the number of observations, improve the accuracy of model estimation, and reduce the estimation error caused by time series model and cross-section model. The panel regression form is as follows:

$$y_{it} = \beta_0 + \beta_1 x_{it} + \varepsilon_{it}$$

Where i represents the individual (region) and t represents the time (year); x_{it} includes intercept term, individual dummy variable, time trend term and individual variable; ε_{it} is a perturbation term. Therefore, in order to explore the dynamic relationship between economic growth, degree of industrialization and urbanization rate, this paper establishes the following three models:

Model 1: $\ln GDP_{it} = \beta_{10} + \beta_{21} IR_{it} + \beta_{12} CR_{it} + \varepsilon_{it}$

Model 2: $IR_{it} = \beta_{20} + \beta_{21} \ln GDP_{it} + \beta_{22} CR_{it} + \varepsilon_{it}$

Model 3: $CR_{it} = \beta_{30} + \beta_{31} \ln GDP_{it} + \beta_{32} IR_{it} + \varepsilon_{it}$

Before panel regression, it is necessary to select fixed effect model and random effect model. The commonly used methods include F test and Hausman test. The first step is to carry out the F test. The purpose of this step is to determine whether it is suitable for the mixed effect model or a fixed

effect model. When the F value exceeds 0.05, the mixed effect model will be used instead of the Hausman test. When the F value is lower than 0.05, the original hypothesis will be rejected and the Hausman test will be repeated. Hausman test adopts fixed effect mode when error probability is less than 0.05, and random effect mode when error probability is greater than 0.05.

IV. EMPIRICAL RESULTS AND DISCUSSIONS

4.1 Analysis of the impact of urbanization and industrialization on economic growth

First, use F-test and Hausman to select the model form as follows:

Table 2 F test and Hausman test

test type	F-test		Hausman test	
	F statistic	Prob	χ^2	Prob
Cross-sections	23.00	0.00	202.58	0.00
Period	85.37	0.00	483.70	0.00

It can be seen that the results of F test and Hausman test reject the original hypothesis at the level of 5% significance, indicating that the double fixed effect model should be selected. The regression results are as follows:

Table 3 Regression of the impact of IR and CR on GDP

Variable	Coefficient	Std. Error	t-Statistic	Prob.
IR	0.020	0.001	13.769	0.000
CR	0.012	0.002	7.650	0.000
C	9.179	0.088	103.726	0.000
Cross-section fixed	Yes			
Period fixed	Yes			
R-squared	0.980			
Adjusted R-squared	0.978			
S.E. of regression	0.099			
Sum squared resid	4.721			
Log likelihood	494.670			
F-statistic	485.202			
Prob(F-statistic)	0.000			

The regression equation is:

$$\ln GDP_{it} = 9.179 + 0.021 IR_{it} + 0.012 CR_{it} + \varepsilon_{it}$$

The regression results show that the R square of the model is 0.980, and the model has a good fit, indicating that the explanatory degree of each explanatory variable to economic growth is 98%, and the overall regression effect is relatively significant. From the result of regression, the degree of industrialization IR is significantly positively correlated with the economic growth GDP at the level of 1%, and the regression coefficient is 0.020, indicating that the economic growth GDP will increase by 0.02% on average for each unit of increase in the degree of industrialization. It shows that the higher the degree of industrialization in China will promote the economic growth of each province. The urbanization rate

CR has a significant positive impact on the economic growth GDP at the level of 1%. The regression coefficient is 0.012, indicating that the economic growth GDP will increase by 0.012% on average for each unit of urbanization. It shows that the higher the degree of urbanization in China will promote the economic growth of each province.

4.2 Analysis of the impact of economic growth and urbanization on industrialization

First, use F-test and Hausman to select the model form as follows:

Table 4 F test and Hausman test

test type	F-test		Hausman test	
	F statistic	Prob	statistic	F statistic
Cross-sections	63.27	0.00	17.07	0.00
Period	7.42	0.00	98.99	0.00

It can be seen that the results of F test and Hausman test reject the original hypothesis at the level of 5% significance, indicating that the double fixed effect model should be selected. The regression results are as follows:

Table 5 Regression of the impact of GDP and CR on IR

Variable	Coefficient	Std. Error	t-Statistic	Prob.
GDP	14.324	1.040	13.769	0.000
CR	-0.024	0.043	-0.562	0.574
C	-112.855	10.313	-10.943	0.000
Cross-section fixed	Yes			
Period fixed	Yes			
R-squared	0.937			
Adjusted R-squared	0.930			
S.E. of regression	2.671			
Sum squared resid	3410.911			
Log likelihood	-1239.876			
F-statistic	146.881			
Prob(F-statistic)	0.000			

The regression equation is written as follows:

$$IR_{it} = -112.85 + 14.32 \ln GDP_{it} - 0.024 CR_{it} + \varepsilon_{it}$$

The regression results show that the R square of the model and the adjusted R square are 0.937 and 0.930 respectively, and the model has a good fit, indicating that the explanatory degree of each explanatory variable to economic growth is 93%, and the overall regression effect is relatively significant. From the result of regression, the economic growth GDP has a positive impact on the degree of industrialization IR at the level of 1%. The regression coefficient is 14.32, indicating that the degree of industrialization IR increases by 14.32 units on average for each 1% increase in economic growth. It shows that China's economic growth will positively promote the industrialization process of each province. The urbanization rate CR has a negative impact on the industrialization degree IR, with a regression coefficient of -0.024, but its corresponding P value is 0.574, which is not significant, indicating that the urbanization rate has a weak impact on the industrialization degree of each province in

China.

4.3 Analysis of the impact of economic growth and industrialization on urbanization

First, use F-test and Hausman to select the model form as follows:

Table 8 F test and Hausman test

test type	F-test		Hausman test	
	F statistic	Prob	statistic	F statistic
Cross-sections	129.97	0.00	0.00	1.00
Period	25.40	0.00	0.00	1.00

It can be seen that the F test rejected the original hypothesis at the 5% significance level, while the Hausman test accepted the original hypothesis at the 5% significance level, indicating that the double random effect model should be selected. The regression results are as follows:

Table 9 Regression of the impact of GDP and IR on CR

Variable	Coefficient	Std. Error	t-Statistic	Prob.
GDP	10.112	0.300	33.722	0.000
IR	-0.109	0.025	-4.328	0.000
C	-48.349	3.505	-13.793	0.000
Cross-section random	Yes			
Period random	Yes			
R-squared	0.729			
Adjusted R-squared	0.728			
S.E. of regression	3.084			
F-statistic	704.324			
Prob(F-statistic)	0.000			

The regression equation is written as follows:

$$CR_{it} = -48.34 + 10.11 \ln GDP_{it} - 0.109 IR_{it} + \varepsilon_{it}$$

The regression results show that the R square and adjusted R square of the model are 0.729 and 0.728 respectively, and the model has a good fit, indicating that the explanatory degree of each explanatory variable to economic growth is 72.8%, and the overall regression effect is relatively significant. From the result of regression, the economic growth GDP has a positive impact on urbanization CR at the level of 1%. The regression coefficient is 10.11, indicating that the urbanization CR increases by 10.11 units on average for each 1% increase in economic growth. This shows that China's economic growth will be promoting the urbanization process in various provinces. The degree of industrialization IR has a negative impact on the urbanization rate CR, which is significant at the level of 1% significance, and the regression coefficient is -0.109, indicating that the degree of industrialization will inhibit the urbanization process of various provinces in China. That is to say, the benign development of urbanization promotes the transformation and upgrading of industrialization and helps to achieve the integrated development of cities and industries. However, there are some misunderstandings in the theoretical understanding of urbanization in China, such as "de-

industrialization", and there are some phenomena such as pseudo-urbanization in practice. Many drawbacks brought about by the abnormal development of urbanization in China have not only become factors restricting the upgrading and development of industrialization, but also become obstacles to the development of new urbanization. Only by grasping the synchronous development relationship between industrialization and urbanization at the intermediate level, handling the new requirements of the new concept of industrial and urban integration development on urbanization and industrial development, and coordinating the role of urbanization and industrialization in the new "four modernizations", can we realize the industrial and urban integration development in the simultaneous promotion of urbanization and industrialization.

V. CONCLUSION AND IMPLICATION

A new type of industrialization and a new type of urbanization are the two major driving forces for sustained and steady economic growth. New-type industrialization provides impetus and support for new-type urbanization. The development of new urbanization also provides a good spatial carrier for the development of new industrialization. Promoting the common development of the two is an important support and guarantee for sustained, stable and sound economic development. Therefore, we should earnestly promote the deep integration of the new type of urbanization and the new type of industrialization, vigorously strengthen the positive interaction between the new type of industrialization and urbanization, and always insist that the new type of industrialization, IT application, urbanization and modernization complement each other.

This paper selects data indicators related to industrialization, economic growth and urbanization of 31 provinces from 2005 to 2021 from the empirical results, and conducts panel regression, F test and Hausman test for the causal relationship and interaction among the three. The results show that the higher the degree of industrialization in China, the stronger the promoting effect on the economic growth of the provinces. The higher the degree of urbanization in our country, the economic growth of provinces will be bigger. Secondly, the urbanization rate has a weak influence on the industrialization level of our provinces. In other words, healthy urbanization can promote the transformation and upgrading of industrialization and achieve the integrated development of cities and industries. However, in the theoretical understanding of urbanization in our country, there are some misunderstandings such as "deindustrialization", and there are some phenomena such as pseudo-urbanization in practice.

In any case, the new industrialization has promoted the upgrading of industrial structure and technological innovation, improved production efficiency and competitiveness, and thus promoted economic growth. New urbanization has expanded the consumer market and the

demand for the service sector, further driving economic growth. Industrialization and urbanization have brought a large number of job opportunities, absorbed rural labor transfer employment, improved the employment structure, and raised the employment rate and income level. The new industrialization has promoted the upgrading and transformation of the urban industrial structure from the traditional labor-intensive industry to the technology-intensive and knowledge-intensive industry. This upgrading of the industrial structure has improved the competitiveness and innovation ability of the urban economy. Finally, the realization of new industrialization and urbanization requires policy support and planning guidance from the government. The government can promote the smooth progress of new industrialization and urbanization through industrial policies, urban planning, land policies and other means.

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