Journal of Global Economy, Business and Finance (JGEBF) ISSN: 2141-5595
DOI: 10.53469/jgebf.2025.07(08).06

Research Examining the Influence of Sichuan's Industrial Structure on Economic Growth

Kaibo Zhang[1], Lichao Tang[2]

[1]Xizang University's School of Economics and Management, Lhasa City, Xizang Autonomous Region, China
[2]Chongqing Digital Industry Polytechnic College, Chongqing Municipality, China

Abstract: ***As a prominent western province, Sichuan serves as a significant driver of economic growth in the region. This study focuses on 21 cities (prefectures) in Sichuan Province, utilizing urban panel data spanning from 2014 to 2023 to empirically investigate the influence of industrial structure on economic expansion. Our findings reveal that enhancing the industrial structure notably boosts local economic growth. However, its impact exhibits regional variations: it is most pronounced in the Southern Sichuan Economic Zone and the Northwest Sichuan Ecological Demonstration Zone, while having the least effect in the Chengdu Plain Economic Zone. To leverage this understanding, it is recommended to optimize resource allocation to foster coordinated regional development.***

Keywords: Industrial structure, Economic growth, Sichuan province, GDP.

1. Introduction

The industrial structure stands as the backbone of economic development, with its optimization and upgrading closely intertwined with economic growth, forming a pivotal aspect of economic research. Since China's reform and opening up, the country's economy has undergone a significant shift from being factor-driven to being innovation-driven. This transformational journey has been largely shaped by industrial structure adjustments, which have a profound impact on the quality and sustainability of regional economic growth. Sichuan Province, a prominent economic hub in Western China, has consistently leveraged strategies for western development and the advancement of the Yangtze River economic belt to bolster its economic prowess. In 2024, the province achieved a remarkable milestone, with its regional GDP surpassing 6 trillion yuan, securing its position as the sixth-largest economy in the country. This significant growth has positioned Sichuan as a key driver of economic expansion in Western China. However, when compared to the more developed eastern regions, Sichuan's industrial structure still faces challenges. These include a relatively low industrial level, an inadequate proportion of emerging industries, and regional development disparities. Addressing these issues through industrial structure optimization has emerged as a critical priority for achieving high-quality economic development in the province. In Zhou Gangzhong's (2023) empirical analysis of 14 cities and prefectures in Hunan Province, he discovered that rationalizing the industrial structure fosters economic growth. However, Bai Xing and Li Qiong's (2023) research contradicts this, indicating that upgrading the industrial structure does not necessarily stimulate economic growth. Sunziyan's (2023) study revealed a positive U-shaped effect of industrial structure upgrading on economic growth, initially inhibiting and later promoting it. Fengjiale and Ning Changyu's (2023) research suggests that coordinated development between new urbanization and industrial structure upgrading significantly boosts regional economic growth.

This paper empirically analyzes the impact of the industrial structure level on economic growth by utilizing urban panel data from 2014 to 2023, focusing on 21 cities (prefectures) in Sichuan Province as the subject of investigation. The aim is to furnish Sichuan Province with a pertinent policy foundation for crafting economic growth policies.

2. Variable Selection and Data Sources Refinement

The explained variable in this paper is economic growth, represented by the logarithm of per capita GDP (lnper_gdp), which is utilized to ensure balance.

The level of industrial structure (ind) is determined through the application of Liu Kai and Feng Wei's (2024) methodology, which employs a comprehensive weighting approach across three industries. The particular formula utilized is outlined below:

$$ind = \sum_{i=1}^{3} i^* y_i \quad (1)$$

Among them, Yi represents the proportion of the output value of the I industry in GDP. A higher ind value indicates a more advanced industrial structure.

To mitigate the impact of extraneous factors on the dependent variables, this paper introduces the following control variables: employment structure (EM), determined by the ratio of workers in the secondary industry to those in the tertiary industry; urbanization rate (UR), calculated as the proportion of the urban population to the total population; investment, gauged by the ratio of total societal fixed asset investment to GDP; and expenditure (EXP), evaluated by the ratio of general public budget expenditure to GDP.

The data utilized in this paper has been sourced from the Sichuan statistical yearbook, with any missing information being supplemented by the Statistical Bulletins of several cities.

3. Empirical Analysis

3.1 Model Building

To empirically examine the influence of Sichuan's industrial structure on economic growth, this paper establishes an econometric model as outlined below:

$$Y_{it} = \alpha_0 + a_1 X_{it} + \sum \alpha_k control_{it} + \gamma_i + \varepsilon_{it} \quad (2)$$

Y represents the explained variable, X denotes the explanatory variable, $control$ comprises a series of control variables, γ signifies the individual fixed effect, and ε stands for the random perturbation term.

3.2 Baseline Regression.

Based on model (1) presented in Table 1, the coefficient preceding ind is 0.527, and it exhibits significant positivity at the 1% level. This suggests that enhancing the industrial structure notably stimulates regional economic growth. Consequently, Sichuan Province ought to persistently refine resource allocation, facilitate the logical circulation of resources among various industries, elevate the standard of technological innovation across different sectors, accelerate industrial transformation and upgrading, thereby fostering regional economic expansion in the future.

Table 1: Benchmark regression and robustness test findings

	(1)	(2)	(3)
	Y	Y	L.Y
X	0.527*** (3.902)		0.947*** (5.104)
X1		0.212*** (6.086)	
em	0.253 (0.937)	0.092 (0.353)	2.135** (5.410)*
ur	2.192*** (10.029)	1.979*** (9.530)	1.857*** (5.693)
invest	-1.845*** (-7.048)	-1.790*** (-7.207)	0.063 (0.174)
exp	-0.468*** (-5.538)	-0.521*** (-6.493)	0.327** (2.654)
cons	8.823*** (23.688)	10.183** (70.433)*	6.234*** (11.492)
N	210	210	210
R2	0.667	0.697	0.407

Note: The values enclosed in parentheses represent t-statistics. The symbols * * *, * *, and * denote the significance of the coefficients at 1%, 5%, and 10% levels, respectively. This applies to all subsequent instances.

3.3 Robustness Test

To further validate the reliability of the benchmark regression results, this paper conducts a robustness test. Firstly, the explanatory variable is substituted with the ratio of the output value of the tertiary industry to that of the secondary industry to re-evaluate the industrial structure and perform regression analysis. Secondly, regression is performed on the explained variables after introducing a lag period.

3.4 Heterogeneity Analysis

To investigate whether regional heterogeneity exists between the level of industrial structure and economic growth, this paper segments the cities of Sichuan Province into five distinct areas based on their geographical location. These areas include the Chengdu Plain Economic Zone (comprising Chengdu, Deyang, Mianyang, Meishan, Leshan, Ziyang, Suining, Ya'an), the Southern Sichuan Economic Zone (consisting of Zigong, Luzhou, Neijiang, Yibin), the Northeast Sichuan Economic Zone (encompassing Guangyuan, Nanchong, Guang'an, Dazhou, Bazhong), the Panxi Economic Zone (featuring Panzhihua, Liangshan Yi Autonomous Prefecture), and the Northwest Sichuan Ecological Demonstration Zone (which incorporates the Ganzi Tibetan Autonomous Prefecture and the Aba Tibetan Autonomous Prefecture). Referring to Table 2, it is evident that the industrial structure plays a notable role in driving economic growth across the board. However, from the perspective of regression coefficients, the industrial structure level in the Southern Sichuan Economic Zone and the Northwest Sichuan Ecological Demonstration Zone exerts the most significant impact on economic growth, whereas the Chengdu Plain Economic Zone demonstrates the least pronounced effect. This could be attributed to the Chengdu Plain Economic Zone's status as the core area of economic development in Sichuan Province, where industrial development has already reached a certain scale and the industrial structure has advanced to a high level, thereby resulting in a diminished marginal effect.

Table 2: Heterogeneity analysis

	Chengdu Plain Economic Zone	South Sichuan Economic Zone	Northeast Sichuan Economic Zone	Panzhihua Western Economic Zone	Northwest Sichuan Ecological Demonstration Area
	Y	Y	Y	Y	Y
X	0.810*** (4.209)	1.593*** (5.469)	1.333*** (4.296)	1.173** (3.083)	1.555*** (5.027)
em	1.043** (3.178)	-1.795** (-2.923)	1.785** (3.129)	0.305 (0.203)	0.439 (0.481)
ur	0.878** (3.421)	2.160*** (5.077)	-0.130 (-0.175)	2.692* (2.649)	-0.239 (-0.157)
invest	-0.963** (-3.252)	-1.648 (-1.908)	-0.096 (-0.211)	-0.485 (-0.431)	3.086 (0.854)
exp	-1.213*** (-4.463)	-1.891 (-1.470)	-2.145*** (-9.180)	-1.301* (-2.317)	-0.727*** (-4.956)
cons	8.126*** (15.593)	7.638*** (11.523)	6.489*** (8.665)	7.129*** (5.162)	6.752*** (6.246)
N	80	40	50	20	20
R2	0.753	0.716	0.776	0.976	0.891

4. Conclusions and Recommendations

Using urban panel data from Sichuan Province spanning from 2014 to 2023, this paper empirically examines the influence of industrial structure on economic growth. The findings reveal that the advancement of the industrial structure notably fosters regional economic expansion, and this assertion has been validated through several robustness tests. Furthermore, upon conducting heterogeneity analysis, it was discovered that the industrial structure exhibits regional variations in its impact on economic growth. Specifically, it exerts the most significant influence on the Southern Sichuan Economic Zone and the Northwest Sichuan Ecological Demonstration Zone,

whereas its effect is least pronounced in the Chengdu Plain Economic Zone.

Firstly, we must enhance the drive for innovation and facilitate the advancement of the regional industrial structure. In this era of a fresh wave of scientific and technological revolution and industrial transformation, it is imperative to bolster scientific and technological innovations, augment investments in research and development, and catalyze innovative progress and industry transformation. These actions constitute the essence of upgrading the present industrial structure. Hence, it is essential to comprehensively adopt an innovation-driven development strategy, elevate the standard of industrial technology, increase the value-add of diverse industries, and propel the elevation of the regional industrial structure.

Second, it is imperative to optimize resource allocation and foster coordinated regional development. Sichuan, as a strategically significant hinterland of China, boasts a vast territory with a complex and diverse terrain, encompassing the Western Sichuan Plateau, Chengdu Plain, and other distinctive landscapes. Consequently, the economic and social advancement of its cities must be tailored to their respective locational advantages and resource endowments. For instance, the Chengdu Plain Economic Zone, being the most prosperous in terms of economy, population, transportation, and industry, should vigorously pursue the growth of high-tech industries and enhance industrial value-added. The Panxi economic zone, rich in metal mineral resources like steel, vanadium, and titanium, can establish enterprises focusing on high-strength alloys. Local cities must adapt their strategies to suit local conditions, cultivate branded local enterprises, and drive coordinated regional progress.

Acknowledgement

This research was founded by the Youth Project of the China Tibetology Research Centre (Project No. 2024QN003).

References

[1] Zhou Gangzhong’s Analysis of the Impact of Industrial Structure Changes on Economic Development in Hunan Province [J]. Business Watch, 2023, 9(08): 47-50. R. Caves, Multinational Enterprise and Economic Analysis, Cambridge University Press, Cambridge, 1982.

[2] Bai Xing and Li Qiong. The Impact of Industrial Structure Optimization on Economic Growth in Western China [J]. Inner Mongolia Science, Technology, and Economy, 2023, (01): 15-17.

[3] H. H. Crokell, “Specialization and International Competitiveness,” in Managing the Multinational Subsidiary, H. Etemad and L. S, Sulude (eds.), Croom-Helm, London, 1986.

[4] Fang Fuqian, Fu Qi. The Economic Growth Effect of Industrial Structure Upgrading: An Empirical Analysis Based on Panel Data from 31 Provinces in China from 2000 to 2020 [J]. Jianghan Forum, 2024, (01): 12-25.

[5] Lisiqi. The Impact of Industrial Structure Optimization in Beijing, Tianjin, and Hebei on Economic Growth [J]. China Science and Technology Industry, 2024, (10): 60-62.

[6] Sunziyan. Further Exploration of the Impact of Industrial Structure Upgrading and Urbanization on Economic Growth [J]. China Prices, 2023, (01): 45-48.

[7] Fengjiale, Ning Changyu, and Ning Xiaochun conducted research on the economic growth effect resulting from the linkage between new urbanization and the upgrading of industrial structures in Guangxi. Their findings were published in the Journal of Nanning Normal University (Natural Science Edition), 2023, Volume 40, Issue 04, pages 128-137.

[8] Liu Kai and Feng Wei discuss expanding imports, consumer demand, and the upgrading of industrial structure in their article published in the March 2024 edition of Price Monthly, pages 70-78.