

The Impact of Industrial Upgrading and Integration on the Development of Poor Areas: Based on the Survival Analysis of 76 National-level Poor Counties in China

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Abstract: In 2020, China achieved phased victories in poverty alleviation, bringing valuable successful experience to the world's poverty alleviation cause. Most prior research on recidivism and poverty alleviation in disadvantaged areas has either explored a small number of cases or concentrated exclusively on individual factors within poor households, failing to sufficiently account for regional variations. But historically, the majority of research on industrial integration and upgrading was focused on larger economies, giving impoverished regions little consideration. This paper randomly selects 76 poverty-stricken counties from 832 national poverty-stricken counties in China, and makes a quantitative analysis of their successful experience from the perspective of industrial upgrading and industrial integration. The study's findings deviate from earlier studies in that they show that industrial upgrading has a limited effect on the development of impoverished regions and that sophisticated industrial structure has a significantly smaller influence in poor areas than it does in areas with greater levels of development. This study also reveals that the development of impoverished areas is impacted differently by the integration of various businesses. The secondary industry, which has a higher degree of integration with the primary industry, plays a stronger role in promoting regional development, while the tertiary industry, which has a long development cycle and many conditions, plays a lesser role in regional development.

Keywords: Industrial upgrading, Industrial integration, Poor area, Event history analysis

1. Introduction

At the end of 2015, the Chinese government issued a policy document on poverty alleviation. The statement stated that China has reached the end of its efforts to reduce poverty, and that because of the comparatively high and pervasive poverty in certain of the country's central and western regions, reducing poverty will be more expensive and challenging. In order to rescue a significant number of rural residents from poverty by 2020, we must be creative and forward-thinking.

The Chinese government formally unveiled its strategy to reduce poverty in 2016, concentrating on 832 important counties that are considered to be in extreme poverty. The plan aims to address these counties' deficient infrastructure, lack of industrial growth energy, and limited employment opportunities for the impoverished. By 2020, China will have succeeded in eradicating poverty from all rural populations, greatly raising the standard of social and public services, considerably raising

the income of the impoverished, and greatly enhancing living and working conditions in impoverished areas. China's comprehensive poverty alleviation is a milestone event in China's history. It also provides a strong reference for world civilization and the global anti-poverty cause. And in many poverty alleviation cases, characteristic industries have played a crucial role.

2. Research Background and Significance

2.1. Industrial Upgrading

In general, there are two ways that industrial upgrading manifests itself. The first is the modernization and optimization of regional or national industry structures; the second is the industry's internal development. There is a developing relationship in logic between the two, and they are related to each other. And the result of industrial structure upgrading will ultimately act on a new round of industrial upgrading and the growth of economic entities.

Lu Tie and Zhou Shulian believed that China's industrial structure in the early 20th century could not provide beneficial help for further economic growth. And there are not only problems in the structure of the three industries and internal relations, but also the development momentum within each industry needs to be improved. The development potential within the industry has not been fully tapped, and the cooperation and division of labor within the industry need to be improved [1].

Zhou Mingsheng thinks that the industrial structure should be continuously optimized in light of China's policy backdrop of first realizing an all-around prosperous society in order to accomplish a subsequent aim of common prosperity. We should not slack off on the optimization and adjustment of the labor income structure while modernizing and optimizing the industrial structure. From this perspective, the labor and industry should be closely combined, fully cooperated and coordinated to promote China's economic development from individual to group [2].

When looking at the relationship between industry upgrading and economic entity development from the standpoint of industrial structure optimization, Fu Linghui conducted an empirical analysis and discovered a close relationship between the expansion of the economic entity's quantity and industrial structure. In how upgrading the industrial structure and economic development interact. Economic development to a greater extent, promote the optimization of industrial structure, industrial structure and optimization of the effect on economic growth is relatively weak [3].

2.2. Industrial Integration

In 1978 American scholar Negreouponte first proposed the concept of industrial integration. He used three overlapping circles to describe calculation, print and broadcast technology boundaries, and that the intersection will become the most innovative and fastest growing areas [4]. When industrial convergence became more widespread, it began as a phenomenon in rural areas, combining the tourism and agricultural sectors. Over time, it spread to other industries as well. Rural industry integration is the integration of the primary, secondary, and tertiary industries to form a chain integrating production, processing, sales, and service, similar to the idea of "six industries" put forth by Japanese scholar Nara Imamura. This allows farmers to share more profits from the secondary and tertiary industries [5].

Chen Xueyun and Cheng Changming logically and empirically demonstrated the inevitability of industrial integration under China's rural revitalization strategy. They believe that in today's market environment, agriculture is at a disadvantage in all aspects of the transaction, and it is an inevitable trend of market development to integrate and develop with higher-level industries. At present, the level of industrial integration in rural regions of China is low, and there is still a lot of room for development and growth prospects. At the same time, China's rural industrial integration also has

strong regional differences, and the differences between the eastern and western regions are obvious, which also provides certain impetus for China's rural industrial integration [6].

According to Su Yiqing, You Yuting, and Wang Zhigang, the integration of China's three rural sectors is currently defined by a single integration form, a variety of integration degrees, and diverse development techniques from the standpoint of division of labor. China should use agriculture as the channel and base its rural industrial integration on the primary industry. After consolidating the agricultural foundation, the integration of the three industries should be carried out, so as to achieve a more scientific and reasonable industrial profit distribution [7].

2.3. Poverty Alleviation

By the end of 2020, China had lifted all the rural poor out of poverty, with all 832 poverty-stricken counties lifted out of poverty, an achievement that has attracted worldwide attention. The majority of Chinese academics' research on poverty alleviation focuses on the connections between poverty reduction and rural rejuvenation. For instance, Duan Qinghai and Zhao Yong discovered that the ideology of the government and impoverished households had a significant detrimental impact on poverty alleviation in their study of factors affecting poverty alleviation in Chongqing [8]. Geng Xin's analysis of the risk of returning to poverty in ethnic minority areas found that the factors for the poor to return to poverty were concentrated in the poor population and their social and natural environment [9]. Mo Guanghui and Chen Zhengwen conducted an in-depth investigation of the government in poverty alleviation and believed that the government should change from the original single management function to multiple roles such as guide and coordinator, so as to achieve a more active and effective guidance of poverty alleviation [10].

At present, most of the relevant research on industrial upgrading and industrial integration is at the macro level, and few take poor areas as the research object. However, most of the empirical research on poverty alleviation in China focuses on the individual level, and there are few studies that conduct quantitative analysis at the industrial level. From the perspective of industrial upgrading and industrial integration, this paper takes some state-level poverty-stricken counties in China as samples to analyze the role of industrial upgrading variables and industrial integration variables in their poverty alleviation path.

This study presents new ideas for the development of rural areas, especially poor rural areas, from the industrial level by combining the industrial theory with the extremely poor areas at the theoretical level. In practical terms, it provides compelling evidence for poor area governments to improve policy formulation, modify the industrial structure and development mode, offer policy recommendations for the global development of the impoverished, and offer industry-level recommendations for the consolidation of poverty alleviation successes in China's poor areas.

3. Variables Introduction and Model Construction

3.1. Variables Introduction

3.1.1. Independent Variables

In this paper, 76 poverty-stricken counties are randomly selected from the 832 state-level poverty-stricken counties in China for analysis, and the data used are from the National Economic and Social development bulletin published by each poverty-stricken county. The independent variables are mainly used to measure the industrial upgrading and industrial integration of each poverty-stricken county. At the same time, the per capita power of typical rural agricultural machinery and the per capita output value of rural agriculture, forestry, animal husbandry, fishery and service industries are selected as indicators to measure the degree of industrial integration in poor counties.

3.1.2. Control Variables

This paper selects whether the poverty-stricken county is in an ethnic minority area, major industries and per capita GDP as control variables. Previous research has indicated that the challenges associated with mitigating poverty vary somewhat throughout ethnic groups. This essay primarily examines how industrial integration and upgrading affect the fight against poverty. The economic scale of a poor area is a concentrated reflection of its resource endowment, so this paper takes per capita GDP as a control variable to measure regional resource endowment into the regression.

3.1.3. Dependent Variables

In this paper, the number of days from the promulgation of the poverty alleviation policy in 2015 until the announcement of the province where the poverty-stricken county is located is taken as the independent variable and recorded as the time of poverty alleviation, and January 2020 is taken as the time node to register and delete.

3.2. Model Construction

In this paper, OLS regression model and Cox regression model were used to analyze the relationship between industrial upgrading, industrial integration and poverty alleviation time. In summary, the existing research and the information of each county are summarized, we propose the following hypothesis:

H1: The counties with higher degree of industrial upgrading are shorter than those with lower degree of poverty alleviation.

H2: The integration of the primary industry and the secondary industry has a significantly positive impact on poverty alleviation.

H3: The integrated development of the primary industry and the tertiary industry plays an important and significant role in promoting the development of poor areas.

In the OLS regression model, the model is constructed and shown below.

$$Y = \beta_0 + \beta_i X_i + \mu_i \text{Control}_i + \varepsilon \quad (1)$$

In the Cox regression model, the model is constructed and shown below.

$$h(t, X) = h_0(t) \exp(\beta_i X_i + \mu_i \text{Control}_i) \quad (2)$$

4. Result and Discussion

After the data are included in OLS regression, the collinearity test and heteroscedasticity test are carried out respectively. Both tests passed

After the data are included in the Cox regression, the proportional hazards hypothesis is tested, and the P value is 0.669, which does not reject the proportional hazards hypothesis. The final OLS regression and Cox regression results are presented in Table 1.

Table 1: Results of OLS and Cox Regression.

	OLS Model		Cox Model		
	Coef.	Std.Err	Coef.	Std.Err	HR
Independent Variables					
Industrial Upgrading Index	-2.72	2.57	0.23*	0.13	1.02
First and Second Industry Integration Index	-152.85***	52.78	1.06***	0.32	2.89
First and Third Industry Integration Index	5.53	3.88	-0.06*	0.03	0.95
Control Variables					
Nation	153.45**	66.16	1.01**	0.42	2.73
Industry	-91.03	126.21	-0.92	0.64	0.40
Resource Endowment	-205.09**	80.57	0.99**	0.44	2.70
Constant	4212.99***	1078.93	—	—	—
Prob > F/Chi2		0.02		0.01	
R2		0.20		—	
Obs		76		76	

(Note: p < 0.01:***, p < 0.05:**, p < 0.1:*.)

As shown in the above table, in the OLS model, only the independent variables of the industrial integration index of the primary and secondary industries are significant, while the control variables of ethnicity and resource endowment are significant. The integration index of the primary and secondary industries was significantly negatively correlated with the duration of poverty alleviation. Compared with non-ethnic areas, the poverty alleviation time in ethnic areas is also significantly longer. Different regional resource endowments lead to significant differences in poverty alleviation time. In the Cox regression, the independent variable industrial upgrading index, the industrial integration index of the primary and secondary industries, the industrial integration index of the primary and tertiary industries, and the control variables ethnicity and resource endowment were significant. Industrial upgrading significant positive correlation between index and risk of poverty, poverty county industrial upgrading index increase per unit, a 1.02 -fold increased risk of poverty. The integration index of primary and secondary industries is positively correlated with poverty alleviation risk. If the integration index of primary and secondary industries increases by one unit, the risk of poverty alleviation will increase to 2.89 times of the original. The industrial integration index of the primary and tertiary industries has a significant negative correlation with poverty alleviation risk. For every one-unit increase in the integration index of the primary and tertiary industries, the risk of poverty alleviation decreases to 0.95 times the original one.

5. Conclusion

All in all, the lack of infrastructure and inadequate resource endowment make it difficult for impoverished regions to foster economic development. In this study, an industry-centric approach to economic growth in impoverished areas is attempted to be proposed. While there are many great examples of poverty alleviation in China that are directly linked to the growth of the tertiary sector in underdeveloped areas, industrial optimization is not the only means of eradicating poverty. The economic development of poor areas should still find a more suitable local development model, carry out scientific and reasonable evaluation of various local industrial bases, choose a more reasonable industrial structure, take the original industry as the basis, and integrate the development of various industries.

However, there are still shortcomings in this paper. The classification of industries in this paper is relatively simple, and only the primary, secondary and tertiary industries are used as the classification standard, without further consideration of the sub-categories under each major industrial category, and without further exploration of the relationship between specific resource allocation in poor areas and industrial development. For poor areas, it is difficult for their natural resource endowment to support their rapid economic development, and it is difficult for their industrial competitiveness to compare with other places with higher economic development. The development of poor areas should be based on their social resource endowment, examine the industrial situation of the region where they are located, and realize regulation at a more macro level, so that they can undertake part of the industrial achievements of developed areas, so that the development of poor areas can be integrated into regional development and become an indispensable part of regional development. When formulating development strategies, local governments should consider local development as a part of regional or even national development. On the premise of vertical consideration of local development stage, horizontal comprehensive consideration of the positioning of local development in regional development, to achieve rapid and stable development of poor areas.

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