

An Empirical Analysis for the Promoting Effect of Marine Economy on Sustainable Development of Inland Economy

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ABSTRACT

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China has a long coastline. The rapid development of its marine economy has accelerated the interconnection of the ocean-inland industry and realized the development and docking of technology, talents, resources, and transportation. The authors aim to analyze the promoting effect of marine economy on inland economy. To this end, this paper first explores the driving mechanism of ocean-inland economic integration based on the theory of ocean-inland economic integration. Then, the Yangtze River Delta Economic Belt was selected as the research object to explore its role in promoting the sustainable development of inland economy. The study found that the integration of the marine economy and the inland economy can maximize the regional economic effect; the calculation results of the instantaneous rate of change in the economic magnitude from the Yangtze River Delta region to the inland region clearly indicate that the marginal effect of the Yangtze River Delta marine economic belt on the inland economy is also increasing year by year. Finally, a series of measures were proposed to promote the development of ocean-inland integration. The research findings provide a theoretical basis for the rapid and sustainable development of the inland economy.

ADDITIONAL INDEX WORDS: *Marine economy, ocean-inland, sustainable development, Yangtze River Delta, instantaneous rate of change.*

INTRODUCTION

The ocean has extremely rich resources, which is an important guarantee for international trade and global sustainable development strategies. The development of marine economy has promoted economic development and cultural communication in coastal areas (He *et al.*, 2018). However, practices at home and abroad have proved that the pure development of the marine economy increases the gap between the rich and the poor in the region and contributes little to a country. Furthermore, the support of the inland economy is necessary for the development of the marine economy (Sun *et al.*, 2017). Judging from the current status, the marine economy is developing rapidly, and its interaction with the inland industry are further strengthened, which is conducive to gradually inhibit and eliminate the constraints of the industrial structure and technological level *etc.* (Batle *et al.*, 2016; Di *et al.*, 2017).

The inland region is rich in mineral and energy resources. It can continuously provide power capacity for coastal areas, while imported and marine resources can be transferred from coastal regions to inland regions (Young, 2015). The emerging of the coastal industry and marine strategy has driven the development of the traditional economy in inland regions. Existing studies

have shown that the development of the marine economy plays a great role in promoting the inland economy in terms of resources, energy, transportation, and entertainment (Li, 2018). China has a long coastline. It should use the advantages of marine economy to drive the development of inland economy, while rapidly developing the marine economy (Gilmartin and Allan, 2014). Furthermore, the marine economy also carries an economic movement with internal connections and common directions, and there exists a strong linkage mechanism between the marine industry and the inland industry, which lies in the shareability and mobility of production factors. Just because of its development stage, development resources and development technology, coastal areas will continuously stimulate the development momentum of the inland areas (Gaigalis and Skema, 2014). This paper, based on the theory of ocean-inland economic integration, first explores the driving mechanism of ocean-inland economic integration. Then, taking the Yangtze River Delta Economic Belt as the research object, it studies the role of marine economy in promoting the sustainable development of inland economy.

DRIVING MECHANISM OF MARINE ECONOMY TO INLAND ECONOMY

The marine economy and the inland economy have spatial regional differences, both of which are part of human economic activities. Their spatial location and resource objects exhibit different characteristics (Puman and Yao, 2017). There have emerged various researches on the ocean-inland integrated

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development strategy. Scholars have proposed to use the large-scale system advantages of the marine economy to continuously allocate the marine and inland resources, coordinate scientific and technological development, and jointly promote the balanced development of the economy by means of regional imbalance (Sneddon and Fox, 2012). At present, following the rapid development of the marine economy, the ocean-inland resource complementarity, industrial interaction, and economic relevance are constantly increasing, and the trend of ocean-inland integration is becoming more and more obvious (Cuoco and Cronan, 2019). Figure 1 shows the interaction of the integrated marine economy and inland economy. The development of the marine economy and inland economy shows polarization effects and diffusion effects. The development of the marine economy can realize industrial gradient transfer, institutional imitation transplantation, and technology spillover effects, while the inland economy improves the efficiency of resource allocation and promotes the optimization and upgrading of industrial structure and technological progress.

The marine economy and the inland economy are mutually related in terms of commonality, mobility, relevance, and interdependence. The elimination of negative externalities has always been the development point for the rapid integration of the ocean-inland economy. Through technology docking, the economic entity organizations with differences in interests and conflicts in the marine industry and the inland industry were regarded as a community of interests, and industries that did not belong together was taken as internal relations. It's assumed that the entity of the marine economy is M and the entity of the inland economy is N. Figure 2 shows the regulation and control of the marine economy and the inland economy. In Figure 2, Point C indicates that the private marginal cost of the marine industry is equal to the marginal benefit; point A indicates that the social marginal cost of the marine-inland economy joint development is equal to the marginal benefit. Then, the corresponding optimal output is O_2 and the pollution level is PL_2 , while the external uneconomic cost can be expressed as O_1BO_2 . Comparing with point A, the pollution level and external diseconomies are both reduced, indicating that the integration of marine-inland economy can maximize the regional economic effect.

AN EMPIRICAL ANALYSIS FOR THE INTERACTIVE DEVELOPMENT OF MARINE ECONOMY AND INLAND ECONOMY IN THE YANGTZE RIVER DELTA

Analysis for the Current Situation of Ocean-Inland Economic Interaction

From the perspective of the overall strength, the Yangtze River Delta Economic Belt is the region with the strongest economic strength in China, and its radiation ability is high. Shanghai, Jiangsu, and Zhejiang all have large ports, and their industrial enterprises add value, fixed investment, and retail sales of social consumer goods are higher than the national level. The Yangtze River Delta Economic Belt and the inland economy are convergent in industrial structures, and highly complementary in the regional economies. The leading role of government in the interaction between the enterprises helps to realize a community of interests between the coastal area and the inland area. In order to achieve the great development of the National 13th Five-Year Plan, the development of the Yangtze River Delta Economic Belt has become a national strategy, injecting new vitality into the marine

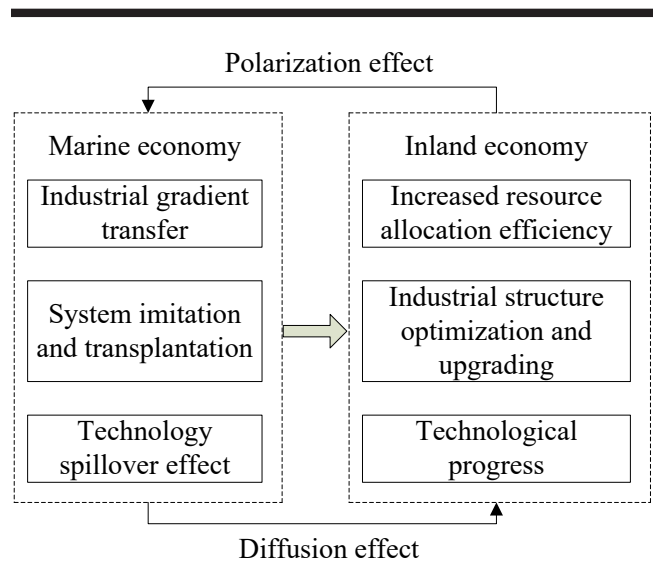


Figure 1. Interaction of the integrated marine economy and inland economy.

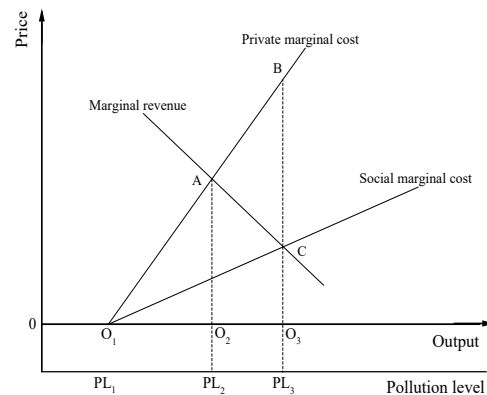


Figure 2. The regulation and control of marine economy and inland economy.

economy in coastal areas. However, as international competitions are intensified, many industries cannot be integrated into the world economy, causing many inland industries at a disadvantage. With the growth of the Guangdong-Hong Kong-Macao Greater Bay Area and the Bohai Rim Region, the inland regions near the Yangtze River Delta Economic Zone have strengthened their connections with this zone, resulting in fierce competitions in inland resources, projects, talents, and technology, which further accelerates the rapid and sustainable development of the inland economy.

The comparative labor productivity method was used to study the ocean-inland economic interaction. When the comparative labor productivity is less than 1, it indicates that there is an outflow of production factors in the region. Figure 3 shows the comparative labor productivity between the Yangtze River Delta region and inland regions. It can be clearly seen that the difference

in the labor productivity level between the two regions increases first and then decreases, and the labor productivity level of the Yangtze River Delta region is higher; also, the productivity factors of inland regions have re-increased in recent years, indicating that the development of the marine economy has a greater effect on the inland economy.

Evaluation of the Ocean-Inland Economic Interaction Effect

The development of the ocean-inland economy is two-way and mutually beneficial. There are many indicators of economy, society, and ecology to measure the interaction between the two, and economic indicators is the most direct ones. Figure 4 shows the interaction between the Yangtze River Delta Economic Belt and the inland economy. Under the government’s support and market’s orientation, ocean-inland enterprises entities are interacted in different fields such as tertiary industries, modern agriculture, high-tech industries, advanced manufacturing, tourism, financial and logistics industries. Figure 5 shows the results of the interdependence between the Yangtze River Delta Economic Belt and the inland economy. It can be clearly seen that the interdependence between the economy of Shanghai, Jiangsu and Zhejiang and the inland economy has increased year by year, of which the interdependence between Jiangsu Province and the inland economy has grown the fastest, followed by Zhejiang Province and Shanghai. To calculate the economic indicators, the instantaneous rate of change from one economic value to another can be used, which is called the margin. According to the Logistic model, the marginal effect of the marine economy on the inland economy in the Yangtze River Delta region can be obtained. Figure 6 shows the marginal effect and elastic coefficient of the Yangtze River Delta Economic Belt and inland economy. It can be clearly seen that the marginal effect of the Yangtze River Delta on inland economy has increased year by year; the elasticity coefficient reflects the ratio of the marine economy in the Yangtze River Delta to the inland economic growth, and its change trend is the same as the marginal effect.

INDUSTRIAL POLICY CONSTRUCTION FOR THE DEVELOPMENT OF MARINE ECONOMY AND INLAND ECONOMY

In recent years, China has successively issued sustainable development strategies and planning outlines for the marine economy, and strengthened the relationship between the marine economy and the inland economy. To ensure the sustainable development of the inland economy, this paper proposes a series of measures, as shown in Figure 7. First, implement the ocean-inland industry coordinated development policy in the gradient process, and focus on promoting current industrial development and regional construction of the highly correlated marine-inland industry, as well as the optimization and upgrading of marine leading industries. Second, perform the ocean-inland industrial cluster development policy of industry-city integration, and establish a few marine development zones, to promote the development of multiple marine-inland industrial clusters with the coastal industry as the core. Third, implement the “point-axis” marine-inland region development policy, foster the growth point of the ocean-inland economic zone, and promote the “axis” construction. Fourth, carry out a coordinated and cooperative development policy of the ocean-inland regions, compile a cross-border administrative boundary development plan, and promote

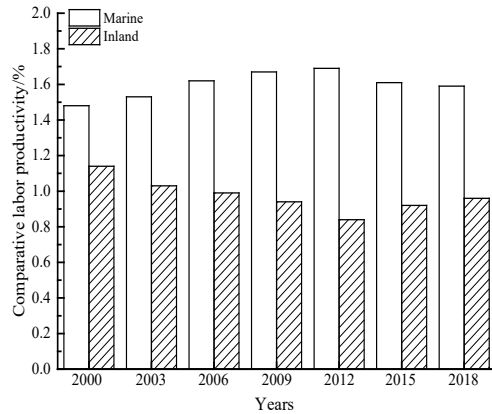


Figure 3. Comparative labor productivity between the Yangtze River Delta region and inland regions

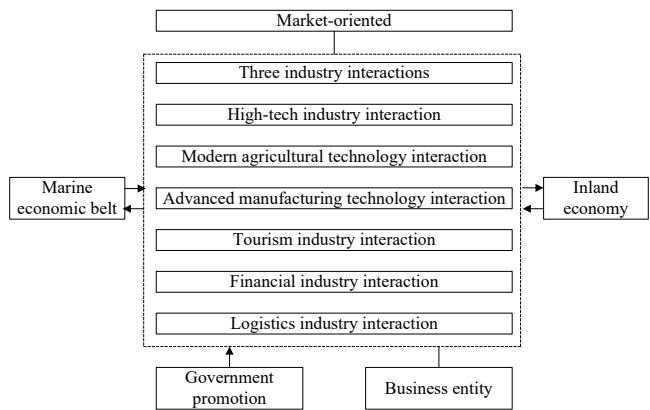


Figure 4. The interaction between the inland economy and the Yangtze River Delta Economic Belt.

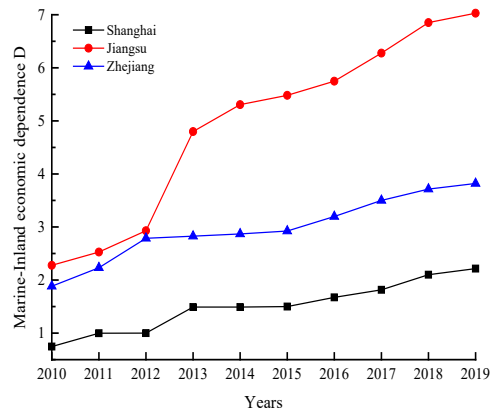


Figure 5. The result of the interdependence between the inland economy and the Yangtze River Delta Economic Belt.

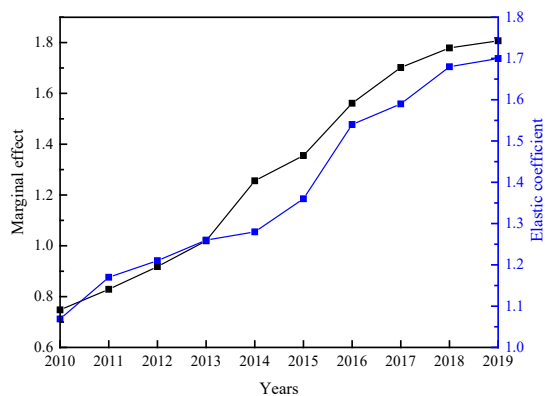


Figure 6. The marginal effect and elastic coefficient between inland economy and Yangtze River Delta Economic Belt.

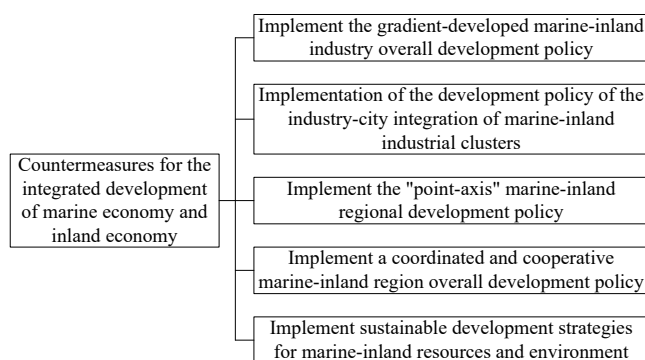


Figure 7. The countermeasure for integrated development of marine economy and inland economy.

the flow and overall allocation of ocean-inland production factors. Fifth, implement sustainable development strategies for ocean-inland resources and environment, manage ecological and environmental pollution in an integrated manner for marine-inland resources, and implement complementary policies for marine and land resources.

CONCLUSIONS

Based on the theory of ocean-inland economic integration, the authors first explore the driving mechanism of ocean-inland economic integration. Then, taking the Yangtze River Delta Economic Belt as the research object, this paper studies the role of marine economy in promoting the sustainable development of inland economy. The conclusions have been drawn as follows:

(1) The marine economy and the inland economy are mutually related in terms of commonality, mobility, relevance, and interdependence. The integration of the marine economy and the inland economy can maximize the regional economic effect.

(2) The difference in the labor productivity level between the Yangtze River Delta region and the inland regions increases first and then decreases, and the labor productivity level in the Yangtze River Delta region is higher, that is, the development of the marine economy has a greater effect on promoting the inland economy.

(3) The interdependence between the economy of Jiangsu and Zhejiang and the inland economy is increasing year by year; through calculating the instantaneous rate of change in the economic magnitude from the Yangtze River Delta region to the inland region, it can be clearly seen that the marginal effect of the Yangtze River Delta marine economic belt on the inland economy is also increasing year by year.

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