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A Study on the Impact of Industrial Agglomeration and Information Friction on the Export Resilience of Agriculture-Related Enterprises

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Abstract: ***Under the background of dual circulation, China's agriculture-related enterprises are facing pressures such as shrinking external demand and insufficient internal supply. Enhancing their competitiveness in the international market is of great significance for achieving the goal of becoming a trading power. This study intends to explore the impact path of agricultural industrial agglomeration on the export resilience of agriculture-related enterprises under the condition of information friction.***

Keywords: Export Resilience; Technical Reputation Effect; Regional Brand Effect.

1. Introduction

Since the reform and opening up, China has continuously developed into the world's second largest economy and the largest trading nation in goods. China's internal and external economic environment has undergone tremendous changes. At the same time, frequent major international events such as the global economic recession and the rise of trade protectionism in various countries have caused a strong impact on China's foreign trade industry, and enterprises are facing unprecedented difficulties. Under the current situation, how to stop the economic decline and stimulate external demand under external shocks is an important factor for the sustainable development and steady progress of China's export enterprises. Resilience has become an essential capability for export enterprises to survive crises and leverage the future, as well as an important guarantee for China to achieve corner overtaking in the post-epidemic era. Industrial agglomeration refers to the process by which the same type or different types of related industries continuously converge in a specific region. Information friction refers to the additional costs consumed beyond the normal expenditure costs caused by information asymmetry in the process of achieving expected goals. Based on previous studies, this study explores the demand-side effect of industrial agglomeration and analyzes the impact mechanism of industrial agglomeration on the export resilience of agriculture-related enterprises under the condition of information friction.

2. Theoretical Analysis and Research Hypotheses

(1) The impact of agricultural industrial agglomeration on the export resilience of agriculture-related enterprises. Agricultural industrial agglomeration has three spatial externalities: production technology

spillover, labor pool, and intermediate input sharing. Traditional externality theory mainly focuses on the impact of supply-side factors such as production technology and factor input on enterprise production, and pays less attention to the export resilience of agricultural enterprises. Existing studies have shown that enterprises within the agglomeration not only improve the competitiveness of China's agriculture-related enterprises in the international market through technology flow and shared labor markets, but also reduce the fixed costs and failure risks of enterprises' exports through information exchange between enterprises. On the other hand, industrial agglomeration helps high-quality enterprises upgrade their product quality to further expand consumer groups, prompting enterprises' export growth to continue to increase. Based on the above analysis, this paper proposes:

Hypothesis 1: Agricultural industrial agglomeration has a significant positive impact on the export resilience of agriculture-related enterprises within the agglomeration scope.

(2) The impact of regional brand effects on the export resilience of agriculture-related enterprises. Agglomeration can alleviate problems such as information asymmetry for consumers in the international market. On one hand, agricultural industries form brand effects in the process of agglomeration, ensuring the market price and product quality of agricultural products, and further enhancing the trust and purchasing demand of international market consumers. On the other hand, consumers' perception of product quality depends on the external cues of the product; the country-of-origin image and popularity of a brand directly affect consumers' purchasing attitudes and intentions. Consumers often need to rely on product external cues to help them evaluate the quality of products and make more satisfactory purchasing decisions. Based on the above analysis, this paper proposes:

Hypothesis 2: Enhancing regional brand promotion reduces information friction and strengthens the export resilience of agriculture-related enterprises within the agglomeration scope.

(3) The impact of technological reputation effects on the export resilience of agriculture-related enterprises. Information asymmetry makes it difficult for consumers in the international market to accurately identify the product quality of export enterprises. A company's reputation is often significantly positively correlated with its innovation capability or product quality, while high-quality products are often more favored by consumers. The better the quality of exported products, the higher the technological reputation effect of the relevant enterprises, and the stronger consumers' willingness to consume. Based on the above analysis, this paper proposes:

Hypothesis 3: Enhancing technological reputation effects reduces information friction and strengthens the export resilience of agriculture-related enterprises within the agglomeration scope.

3. Data Sources, Variable Selection, and Model Selection

3.1 Data Sources.

The data in this paper are mainly sourced from the National Tax Survey Database (2007-2016), the China Customs Import and Export Database, and the China Statistical Yearbook. The databases are cleaned as follows according to the requirements of this study: First, samples with missing or negative values in key variables are excluded. Second, samples whose codes conform to the classification of agriculture-related enterprise codes are screened out according to the national economic codes. Third, matching with other databases is conducted based on regional codes and enterprise codes.

3.2 Variable Selection.

1) Explained Variable: Export Resilience (REC). This study only analyzes samples of agricultural-related enterprises and export products in 2008, excluding exports and changes of new export products. 2) Explanatory Variable: Agricultural Industrial Agglomeration. This study uses two measurement methods: The first is the EG index, which involves the calculation and combination of the spatial Gini coefficient and the Herfindahl index, and can more accurately reflect the degree of intra-industry concentration. The second measurement method is the Location Entropy, which assesses the agglomeration degree by comparing the total economic output of a certain industry in a region with that of the same industry nationwide. 3) Mechanism Variables: This paper uses the interaction term between the composite index of advertising expenses and trademark purchase expenses in the database and the independent variable to measure the regional brand effect, and uses the interaction term between new product R&D expenses and the independent variable to measure the technological reputation effect. 4) Control Variables: To avoid the impact of other variables on the regression variables, control variables that may affect the regression variables are included, including enterprise asset-liability ratio, enterprise size, enterprise establishment time, enterprise fixed assets, and enterprise capital intensity.

3.3 Model Selection

1) Benchmark Regression Model: To test the impact of agricultural industrial agglomeration on the export resilience of agricultural-related enterprises, this paper sets the following econometric model:

$$REC = \alpha_0 + \alpha_1 LQ_{it} + \alpha_2(Con) + \beta_{it} + \theta_{it} \quad (1)$$

Where, i represents the province; t represents the year; REC represents the export recovery degree and recovery speed of agricultural-related enterprises; LQ_{it} represents the industrial cluster level. Con is the combination of control variables, including enterprise liability, enterprise size, capital intensity, enterprise fixed assets, and enterprise age. β_{it} represents province and year dual fixed effects, and θ_{it} is the random disturbance term.

2) Mechanism Model Setting: To test the impact of different paths of regional brand effect and technological reputation effect on the export resilience of agricultural-related enterprises, this study adds mechanism variables and interaction terms to construct a regression model.

$$REC = \alpha_0 + \alpha_1 LQ_{it} + \alpha_2 Br + \alpha_3 LQ_{it} Br + \alpha_3(Con) + \beta_{it} + \theta_{it} \quad (2)$$

$$REC = \alpha_0 + \alpha_1 LQ_{it} + \alpha_2 Te + \alpha_3 LQ_{it} Te + \alpha_3(Con) + \beta_{it} + \theta_{it} \quad (3)$$

Where, the newly added variables Br and Te are mechanism variables, measuring regional brand effect and technological reputation effect respectively; $LQ_{it}Br$ and $LQ_{it}Te$ are the interaction terms of regional brand effect, technological reputation effect and the core explanatory variable respectively.

4. Empirical Tests and Results

4.1 Benchmark Model Regression Results.

As shown in Table 1, agricultural industry agglomeration has a significant positive impact on the export resilience of agricultural-related enterprises, with the industry agglomeration coefficient being significantly positive at the 1% level, indicating that agricultural industry agglomeration can significantly enhance the export resilience of China's agricultural-related enterprises. After adding year-province fixed effects, the independent variable remains significant at the 1% confidence level. This result suggests that increasing the level of agricultural industry agglomeration within a region can

further promote the improvement of export resilience of agricultural-related enterprises within the industrial agglomeration scope.

Table 1: Benchmark Regression Analysis of Agricultural Industry Agglomeration on Export Resilience of Agricultural-Related Enterprises

Variable Name	Export Resilience of Agriculture-Related Enterprises	
	Export Recovery Speed	Export Recovery Degree
Industrial Agglomeration	0.229***	0.205***
Control Variable	Control	Control
Regional Fixed Effects	YES	YES
Time Fixed Effects	YES	YES
P Value	0.0000	0.0000

Note: ***, **, and * indicate significance at the 1%, 5%, and 10% levels, respectively.

4.2 Regression Results of the Influence Mechanism.

The regression results show that after adding the mechanism variable "regional brand effect", both the industrial agglomeration coefficient and the regional brand effect coefficient are significantly positive at the 5% level, indicating that increasing corporate brand promotion efforts is conducive to improving the export resilience of agricultural enterprises within the agglomeration, and Hypothesis 2 is valid. After adding the mechanism variable "technological reputation effect", the industrial agglomeration coefficient is significantly positive at the 5% level, indicating that enterprises in the region can effectively promote the export of agricultural products of agricultural enterprises within the agglomeration by forming a good technological reputation image, and Hypothesis 3 is valid.

4.3 Robustness Test.

This paper conducts a robustness test by replacing the core explanatory variable with the location entropy to measure the degree of industrial agglomeration and substituting it into the regression equation. The empirical results show that the independent variables and mechanism variables are still significant at the 1% confidence level, and Hypotheses 1, 2, and 3 are all valid.

Table 2: Benchmark Regression Analysis of Agricultural Industrial Agglomeration, Information Friction on Export Resilience of Agricultural Enterprises

Variable Name	Export Resilience of Agricultural-Related Enterprises			
	Export Recovery Speed	Export Recovery Degree	Export Recovery Speed	Export Recovery Degree
Industrial Agglomeration	0.229***	0.205***	0.180**	0.165**
Regional Brand Effect	0.050***	0.059***	-	-
Technological Reputation Effect	-	-	0.066***	0.054***
Control Variable	Control	Control	Control	Control
Regional Fixed Effect	YES	YES	YES	YES
Time Fixed Effect	YES	YES	YES	YES
P Value	0.0000	0.0000	0.0000	0.0000

5. Conclusions and Policy Recommendations

5.1 Conclusions.

1) Agricultural industrial agglomeration across different regions can significantly enhance the export

resilience of agricultural-related enterprises within the agglomeration area. 2) Mechanism tests reveal that agricultural industrial agglomeration can significantly strengthen the export resilience of agricultural-related enterprises within the agglomeration area through regional brand effects. Consumers' brand awareness helps enterprises establish high brand loyalty; meanwhile, enterprises' improved innovation capability facilitates the replication and promotion of core competitiveness brought by technology to new products, forming a regional technological reputation and enabling stable survival in the international market.

5.2 Policy Recommendations.

1) Restructure the industrial layout and promote rational agglomeration. The agglomeration of agricultural industries can not only promote technological progress and exchanges among enterprises within the agglomeration area, reduce additional costs caused by labor mobility, but also improve the transparency of information on both supply ends, preventing export enterprises from falling into the dilemma of an "involutionary" growth model. 2) Strengthen regional brand promotion and expand the influence of agglomerated enterprises. Agricultural-related enterprises should attach importance to brand influence and promote brand reshaping and extension. Enterprises should establish a good corporate image, achieve regional brand linkage and resource sharing, and enhance consumers' loyalty and recognition. 3) Cultivate enterprises' innovation capability and improve their technological reputation. Agricultural-related enterprises should actively seek breakthroughs and build a good corporate reputation. While actively integrating into the global agricultural product production network, they should strengthen exchanges and interactions with international high-tech enterprises to continuously improve their innovative technology standards.

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