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# Benefit Linkage Effect, Organizational Structure and Collaboration Performance: An Empirical Study of the Agricultural Industrialization Consortium in Shanghai, China

**Qijun Jiang [1], Chunxiao Li [1] and Ting Meng [2,*]**

[1] School of Economics and Management, Shanghai Ocean University, Shanghai 201306, China
[2] School of Economics and Management, China Agricultural University, Beijing 100089, China
* Correspondence: tmeng@cau.edu.cn

**Abstract:** As a new type of agricultural management organization alliance, the effect of the benefit linkage generated by agricultural industrialization consortium on collaboration performance is closely related to the sustainable development of the agricultural economy. Based on survey data on consortia in Shanghai, this paper analyzes the effects of benefit linkage and uses multiple linear regression modeling to comprehensively explore the impact of benefit linkage effects on collaboration performance from both subjective and objective aspects, as well as the differences in impact on the collaboration performance of consortia with different organizational structures. The results show that the benefit linkage effect has a positive impact on collaboration performance, and there are differences in the impact of the benefit linkage effect on collaboration performance under different types of organizational structures, among which the resource allocation effect, capitalization effect and correlation effect of the benefit linkage of non-joint stock consortia have a positive impact on collaboration performance; the resource allocation effect of joint-stock consortia has no significant impact on collaboration performance, the capitalization effect on collaboration performance is significantly lower than that of non-joint stock consortia, and the correlation effect on collaboration performance is significantly higher than that of non-joint-stock consortia. Therefore, under a certain benefit linkage, according to the establishment purpose and collaboration goal, a consortium with different types of organizational structures should be established to give full play to the impact of the benefit linkage effect on collaboration performance and promote the sustainable development of agricultural industrialization.

**Keywords:** agricultural industrialization consortium; benefit linkage effect; organizational structure; industrial organization; collaboration performance



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## 1. Introduction

Since China's reform and opening up, the form of agricultural industrial organization has been evolving, from the main body of farmers to a pattern of coexistence of multiple entities such as farmers, agricultural cooperatives, family farms, and leading agricultural enterprises. However, in practice, the industrial, elemental and benefit linkages between small and medium-sized farmers, leading enterprises and other multiple subjects in the process of agricultural industrialization are not close, and the cooperative relationship is not reciprocal [1], leading to internal conflicts in the process of agricultural industrialization; moreover, the alternative costs are elevated. In the long-term game process, some agricultural business entities gradually realize the problems arising from high costs and the loss of intermediate links—unfavorable to the formation of regional brands—and that quality control is not easily traceable. Hence, they gradually team up in various ways to reduce costs and losses, form regional brands, and enhance premium capacity [2]. In 2017, the Chinese Ministry of Agriculture and Rural Affairs and six other ministries jointly issued the "Guidance on Promoting the Development of Agricultural Industrialized Consortia" to

promote collaboration among agricultural business entities and foster the development of agricultural industrialized consortia (hereafter referred to as consortia).

Consortia are integrated alliances of agricultural business organizations comprising new agricultural business entities such as leading enterprises, farmers' cooperatives and family farms based on the division of labor, scale of operation and linkage of benefits, and represent a new form of agricultural business organization at the forefront of modern agricultural production in China [3]. In recent years, many scholars have conducted research on consortia. Regarding the connotation of consortia, some countries consider them to be comprehensive industrial structures including all agricultural production services such as agricultural production, transportation, storage and processing, termed agro-industrial complexes, agro-food complexes and agribusiness alliances [4], which is consistent with the general understanding of consortia in China. Regarding consortium performance, some scholars analyzed the performance of consortia from the perspectives of government, market, and their own management [5–7]. A consortium forms an agricultural-scale operation through the specialized division of labor and coordinated operation of multiple factors, promoting the integrated development of primary, secondary, and tertiary industries and improving comprehensive agricultural production efficiency [8]. In terms of empirical analysis, Tang [9] used multiple linear regression models based on survey data from Hebei, Anhui, and Jiangxi to study the effects of factor integration, functional co-location, coalition co-governance, and benefit linkage of consortia on their performance. Liu et al. [10] analyzed the creation risks and problems of the Anhui Suizhou consortium as an example, and suggested that the government should strengthen the targeting of policies. Dou et al. [11] empirically analyzed the development of consortia and considered them as an effective system to promote the integration of primary, secondary, and tertiary industries in agriculture.

In this paper, we start from the benefit linkage among the subjects of the consortium to investigate what effect the benefit linkage has on the development of the consortium and whether the benefit linkage effect has an impact on the consortium's collaboration performance. In the process of consortium development, different types of industrial organizational structures are formed, such as "company+ farmers+ cooperative", "company+ farmers+ cooperative association", "joint-stock consortium", etc. Are there any differences in the effects of benefit linkage between different organizational structures of consortia on their collaboration performance? If so, what are the reasons behind these differences? Based on survey data on Shanghai consortia, we analyzed the connotation of the benefit linkage effect of consortia, the impact of the benefit linkage effect on collaboration performance, and the differences in the benefit linkage effect on collaboration performance with different organizational structures to reveal a universal law between the benefit linkage effect, organizational structure and collaboration performance of consortia. This analysis has important theoretical and practical significance in terms of how to bring into play the benefit linkage effect of consortia, promote the improvement of consortium collaboration performance, drive farmers to increase their income and agricultural efficiency, enhance the endogenous power of rural industrial development, and promote the sustainable development of agriculture.

## 2. Theoretical Analysis and Research Assumptions

### *2.1. Benefit Linkage Effect and Consortium Collaboration Performance*

Benefit linkage refers to the relationship and operation of a community of interest with the goal of maximizing benefits, with enterprises, cooperatives and farmers as the main body, mainly including capital linkage, technology linkage, brand linkage and service linkage [12]. It is the key to the organic linkage between farmers and enterprises and farmers and modern agricultural development, and is a guarantee of increased farmer income [13]. The consortium members adopt different benefit linkage modes such as order contracts and share cooperation to form a community of shared interests of "benefit-sharing and risk-sharing" and adopt static and dynamic benefit distribution methods to form a good benefit

distribution relationship among different business entities. Consortium collaboration performance is actually a manifestation of inter-organization collaboration performance. Inter-organizational collaboration performance is a comprehensive return for the purpose of achieving cooperation goals and improving enterprise benefits, which can be divided into subjective performance and objective performance [14–16], specifically represented by objective performance such as profitability and goal attainment, and subjective performance such as collaboration satisfaction and cooperation willingness [17]. The benefit linkage promotes collaboration among upstream and downstream members of agriculture, and realizes the transformation of agricultural production from a single entity to the union of multiple entities such as leading enterprises, cooperatives and family farms. It enables the members of the consortium to strengthen the interaction and collaboration among members under the incentive of shared benefits and jointly improve the collaboration performance to promote a win–win situation for multiple parties [18]. The establishment of long-term and stable interest linkage has become an inevitable trend of agricultural industrialization and an inherent requirement for farmers to increase their income [19]. Therefore, benefit linkage is the core of the operation of the consortium, which affects the consortium collaboration performance.

The benefit linkage effectively organizes the consortium's participants through specific benefit distribution rules, forming a community of benefits. Based on the transaction cost theory, the benefit linkage saves the transaction cost among the subjects of the consortium and forms a resource allocation effect instead of market transactions. Moreover, through internalization of transactions, benefit linkage promotes the sharing of various resources within the consortium, optimizes resource allocation, improves the utilization rate of the consortium's resources, promotes technological innovation, improves the added value of agricultural products and product quality [20], effectively enhances the earnings of each subject and the overall earnings of the consortium, and brings about the capitalization effect. In addition, the benefit linkage strengthens the blood relations and geopolitical ties among the participating subjects, effectively closes the relationship among members, maintains the stability of the relationship among the members of the consortium, organically organizes production, technology, products, brands, and markets, promotes the collaboration of industries, and brings about the correlation effect.

#### 2.1.1. Resource Allocation Effect and Collaboration Performance

In line with the role of benefit linkage, each member in the consortium reasonably arranges capital, land, labor, technology, talent and other factors, which promotes the free flow and rational use of the consortium's capital, technology, information, management and other factors, optimizes the allocation of resources, and achieves the optimal allocation of resources in the agricultural industry chain [21], thus yielding the resource allocation effect. Effective benefit linkage can regulate the rights and obligations of each interested party, reduce opportunistic behavior [22], break through factor bottlenecks by stimulating, restraining, and guaranteeing the interests of all participants in industrial integration, and promote all types of factors to break regional and industrial boundaries and accordingly achieve better factor integration and intensive allocation [23]. Wang et al. [3] pointed out that the consortium optimizes the input use of factors, so that each member in the consortium not only benefits from cost reduction but also improves the overall efficiency. Based on the above analysis, the following hypothesis is proposed.

**Hypothesis 1 (H1).** *The resource allocation effect of benefit linkage positively impacts the collaboration performance of the consortium.*

#### 2.1.2. Capitalization Effect and Collaboration Performance

Reasonable benefit linkage promotes the sharing of various resources within the consortium, enhances the resource utilization rate, drives technological progress and innovation, improves production efficiency, attracts agricultural product processing enterprises

and e-commerce enterprises to join the consortium, stimulates the consortium members to increase capital investment, develops special, high value-added agricultural products, further increases the product brand value and comprehensive competitiveness, and thus generates a capitalization effect. The business scope of the consortium covers agricultural planting, processing, storage, logistics, marketing and other industries, and the members of the consortium can promote the adjustment of agricultural production and operational structure through the benefit linkage, improve the organization and specialization of the consortium, bring about the improvement of production efficiency and quality under the leading enterprises, and promote the commercialization and large-scale production of agricultural products to a certain extent [24]. Therefore, the capitalization effect of benefit linkage contributes to the improvement of product quality, enhances the comprehensive competitiveness of the consortium's products through better quality, drives the sales and innovation of agricultural products, and improves the collaboration performance of the consortium. Based on the above analysis, the following hypothesis is proposed.

**Hypothesis 2 (H2).** *The capitalization effect of benefit linkage positively impacts the collaboration performance of the consortium.*

#### 2.1.3. Correlation Effect and Collaboration Performance

The consortium closely connects different business entities through benefit linkage, forming a partnership [25], and there is a phenomenon of "a prosperity, a loss for both". On the one hand, the benefit linkage can tighten the blood and geographical ties among members and stabilize the overall organization of the consortium. On the other hand, the cooperation between upstream, midstream and downstream stages of agriculture promotes cooperation between different industries, extends the industrial chain, and enhances the value chain, which is conducive to the integrated development of primary, secondary, and tertiary industries. A reasonable benefit linkage enables all business entities of the consortium to participate in agricultural production and operation activities, presenting the characteristics of industrial cross integration, which is conducive to improving the collaboration performance of the consortium [26]. The key to the success or failure of industrial integration lies in the completeness of the benefit linkage [23]. Improving the stability, effectiveness, and closeness of benefit linkage is significant in driving increases in farmers' income and promoting the prosperity of rural industries [3]. Closer benefit linkage contributes to the development of various forms of industrial integration and can increases farmers' income while industrial performance is improved [27]. Based on the above analysis, the following hypothesis is proposed.

**Hypothesis 3 (H3).** *The correlation effect of benefit linkage positively impacts the collaboration performance of the consortium.*

### *2.2. The Influence of Consortium Organizational Structure on the Relationship between Benefit Linkage and Collaboration Performance*

Chinese consortia have gone through different stages of development and formed different forms of industrial organization structures, such as non-joint-stock consortia of "company + farmer", "company + cooperative + farmer", "company + cooperative association + farmer", and different types such as "joint-stock company." Non-joint-stock consortia are mainly led by leading enterprises. Farmers provide agricultural products according to the requirements of leading enterprises, or cooperatives organize farmers' production according to the requirements of leading enterprises and integrate the resources of farmers, cooperatives, and leading enterprises. Farmers participate in the industrial chain or value chain of leading enterprises, and farmers can freely join or exit the consortium. The closeness of each entity is not high, and the collaboration relationship is flexible. In the "joint-stock company" type of consortium, the leading enterprises and village collectives, cooperatives, farmers, and other joint-stock companies are jointly registered, and the central bodies take shares in different forms to implement corporate operations. The participation

or withdrawal of farmers in this type of consortium is subject to many conditions, the close-knit relations between the central bodies are strong, and the collaborative relationship is fixed.

The organizational collaboration performance of agricultural industrialization is closely related to the different developmental stages of its organizational structure [28]. The degree of standardization of the internal governance structure and the soundness of the benefit distribution system have a significant positive impact on organizational performance [29,30], and the collaboration performance of different organizational structures is different [31]. Under different types of industrial organization structures, the degrees of organization and specialization of the consortium are different, and the utilization and optimal allocation of resources such as capital and technology of benefit are different, which have different effects on the collaboration performance. With the development of agricultural industrialization, the organizational structure of the consortium is constantly changing, and the strength of the consortium members is continuously enhanced. Through the benefit linkage, the overall strength of the consortium is improved, the production efficiency and quality of products are improved, the brand image is created, the brand influence and brand value are created, and the products of the consortium can withstand fierce market competition, thus affecting the collaboration performance. In addition, when the types of industrial organization structure of a consortium between the main body of the benefit linkage degree are different, the extension width and breadth of the industrial chain and the degree of industrial integration are also different, and the consortium collaboration performance will be different. Therefore, this paper holds that for consortia with different types of organizational structures, such as joint-stock and non-joint-stock organizations, there are differences in the impact of the resource allocation effect, capitalization effect, and correlation effect brought about by the benefit linkage on the collaboration performance. To sum up, the following hypotheses are proposed.

**Hypothesis 4 (H4).** *For joint-stock and non-joint-stock consortia, the resource allocation effect of benefit linkage has different effects on collaboration performance.*

**Hypothesis 5 (H5).** *For joint-stock and non-joint-stock consortia, the capitalization effect of benefit linkage has different effects on collaboration performance.*

**Hypothesis 6 (H6).** *For joint-stock and non-joint-stock consortia, the correlation effect of benefit linkage has different effects on collaboration performance.*

## 3. Research Design

### *3.1. Data Sources and Sample Statistics*

According to the research framework, a questionnaire was designed. On the basis of interviews and pre-surveys, the research group constantly improved the questionnaire through team discussion and expert suggestions. The first part of the questionnaire was a survey of basic information, including the role in the consortium, the years of consortium establishment, the scale of consortium land, the types of products provided by the consortium, and the organizational structure. The second part of the questionnaire was designed for the benefit linkage effect and the collaboration performance of the consortium, using a seven-point Likert scale, where "1" indicates complete opposition and "7" indicates complete agreement, and the consortium participants scored each question. The data used in this study were obtained from the group's field surveys and interviews with consortia in various districts of Shanghai from July to October 2021, as well as from questionnaires distributed to consortium participants through the Shanghai Municipal Agriculture Commission. A total of 249 questionnaires were collected in this study, and the final number of questionnaires was 241 after eliminating invalid questionnaires, with an effective rate of 96.8%. The statistical characteristics of the sample are shown in Table 1.

**Table 1.** Statistical characteristics of sample.

| Category | Options | Number of Samples/pc | Percentage/% |
|---|---|---|---|
| Roles in the consortium | Farmers | 27 | 11.2 |
| | Family farm | 60 | 24.9 |
| | Cooperatives | 118 | 48.9 |
| | Leading companies | 25 | 10.4 |
| | Village council | 11 | 4.6 |
| The years of consortium establishment | Within one year | 44 | 18.3 |
| | One to two years | 46 | 19.1 |
| | Two to three years | 30 | 12.4 |
| | More than three years | 121 | 50.2 |
| The scale of consortium land | Within 20 hectares | 139 | 57.7 |
| | 20–40 hectares | 40 | 16.6 |
| | 40–60 hectares | 7 | 2.9 |
| | 60–80 hectares | 15 | 6.2 |
| | 80–100 hectares | 3 | 1.2 |
| | More than 100 hectares | 37 | 15.4 |
| The types of products provided by consortium | Cereals and oils | 146 | 60.6 |
| | Animal husbandry | 17 | 7.1 |
| | Fruits and vegetables | 120 | 49.8 |
| | Fisheries | 21 | 8.7 |
| | Leisure experience | 27 | 11.2 |
| | Others | 15 | 6.2 |
| Consortium organizational structure | Joint-stock consortium | 179 | 74.3 |
| | Non-joint-stock consortium | 62 | 25.7 |

### *3.2. Variable Index Selection*

#### 3.2.1. Explained Variables

In this paper, consortium collaboration performance was treated as the explained variable. In the measurement of collaboration performance, Hu [32] classified the collaboration performance of "company+ farmers" into organizational adaptability to the external environment, organizational profitability, satisfaction with collaboration, and willingness to continue collaboration; Pan et al. [33] combined objective and subjective indicators to evaluate collaboration performance in terms of profitability, goal attainment, relationship continuity and satisfaction; Zhang et al. [17] used subjective performance indicators such as satisfaction, willingness to collaborate again, and persistence of collaborative relationship as well as objective performance indicators such as cost, income, and goal achievement to measure collaborative performance. Based on the previous analysis, the scale was designed by synthesizing the studies of scholars and referring to Simonin's [34] questionnaire. Thus, according to the characteristics of collaboration between different subjects in the consortium, the collaboration performance was measured comprehensively from two aspects: the subjective performance of satisfaction with the collaboration process and willingness to continue collaboration, and the objective performance of achieving collaboration goals and improving collaboration benefits. A seven-point Likert scale was used to design question items from different aspects, and weights were calculated by the entropy method. The results are shown in Table 2.

#### 3.2.2. Explanatory Variables

This study treated the benefit linkage effect as the explanatory variable. According to the above theoretical analysis of the benefit linkage effect, the items of the benefit linkage effect of the consortium were measured. Among them, the resource allocation effect was divided into five measurement items of the rational utilization of different types of resources in the benefit linkage; the capitalization effect was divided into five measurement items: benefit linkage promotes technological progress and innovation,

affects agricultural production efficiency, product quality, brand value, and comprehensive product competitiveness; the correlation effect was divided into four measurement items: the benefit linkage helps the consortium members to jointly operate, promotes closer relationships between members, extends the agricultural and industrial chain and promotes industrial integration. The measurement questions were weighted by the entropy method using a seven-point Likert scale, which was used to indicate the resource allocation effect, capitalization effect, and association effect, respectively. The results are shown in Table 3.

**Table 2.** Index system of consortium collaboration performance.

| Target Layer | | Level 1 Indicators | Primary Index Weight | Level 2 Indicators | Secondary Index Weight |
|---|---|---|---|---|---|
| Collaboration performance | Subjective collaboration performance | Satisfied with the collaboration process | 0.2385 | After joining the consortium, I became more and more satisfied, and the cooperation between the subjects was pleasant | 0.5332 |
| | | | | With the increase in consortium members, the collaboration effect of the consortium is more obvious, and the individual value is realized in the process of collaboration | 0.4668 |
| | | Willingness to continue collaboration | 0.2626 | Willing to maintain cooperative relationship in the consortium and create greater value through the Consortium | 0.4914 |
| | | | | The consortium is willing to continue cooperation and jointly formulate the development strategy of the Consortium | 0.5086 |
| | Objective collaboration performance | Collaboration goal achievement | 0.2581 | The consortium has achieved the expected results | 0.4815 |
| | | | | The consortium has achieved the cooperation goal | 0.5185 |
| | | Increased collaboration benefits | 0.2408 | Cost reduction of your consortium in recent 3 years | 0.5457 |
| | | | | The sales revenue of your consortium has increased in recent 3 years | 0.4543 |

#### 3.2.3. Control Variables

This study refers to the research of scholars Tang [9] and other scholars, and treated the years of consortium establishment and the scale of consortium land as control variables. The longer the consortium has been established, and the larger the land scale is, the easier it is to obtain good business performance.

The specific definition of each variable is shown in Table 4.

**Table 3.** Index system of benefit linkage effect.

| Target Layer | Index Layer | Index Weight |
|---|---|---|
| Resource allocation effect | Benefit linkage helps to make rational use of funds | 0.2248 |
| | Benefit linkage is helpful for rational land use | 0.1910 |
| | Benefit linkage helps to make rational use of labor force | 0.2013 |
| | Benefit linkage helps to make rational use of technology | 0.1979 |
| | Benefit linkage helps to make rational use of talents | 0.1851 |
| Capitalization effect | Benefit linkage promotes technological progress and innovation | 0.1795 |
| | Benefit linkage improves production efficiency | 0.2107 |
| | Benefit linkage improves product quality | 0.2066 |
| | Benefit linkage increases the brand value of products | 0.2136 |
| | Benefit linkage improves the comprehensive competitiveness of products | 0.1896 |
| Correlation effect | Benefit linkage is conducive to the joint operation of the consortium members | 0.2434 |
| | Benefit linkage promotes closer relationships between the members of the consortium | 0.2287 |
| | Benefit linkage extends the agricultural industrial chain | 0.2499 |
| | Benefit linkage promotes the integrated development of industries | 0.2781 |

**Table 4.** Variable definitions.

| Variable Name | Variable Meaning and Assignment |
|---|---|
| Consortium organizational structure | Non-joint-stock consortium = 0; joint-stock consortium = 1 |
| Benefit linkage effect | Three dimensions, including resource allocation effect, capitalization effect and correlation effect, are designed to be measured on a 7-point Likert scale. |
| Collaboration performance | The four level 1 indicators of subjective and objective collaboration performance were weighted, and the four level 1 indicators were measured on a 7-point Likert scale with different question designs. |
| Years of consortium establishment | One year and below = 1; 1–2 years = 2; 2–3 years = 3; more than 3 years = 4 |
| Scale of consortium land | 20 hectares and below = 1; 20–40 hectares = 2; 40–60 hectares = 3; 60–80 hectares = 4; 80–100 hectares = 5; 100 hectares and above = 6 |

### *3.3. Index Weight Calculation*

In order to calculate the weight of each index of consortium collaboration performance and benefit linkage effect, the entropy method was used. The weight results are shown in Tables 2 and 3.

$$Y_n = \Sigma y_{ij} w_i \tag{1}$$

$$Y = \sum_{n=1}^{4} Y_n \tag{2}$$

$$X_i = \Sigma x_{ij} w_i \tag{3}$$

where: $Y_n$ is a collaboration performance value, $Y$ is the total collaboration performance value, $X_i$ is the value of benefit linkage effect, $y_{ij}$, $x_{ij}$ is the standardized value of the index, $w_i$ is the index weight.

### *3.4. Selection of Regression Model*

This study examined the impact of the benefit linkage effect on the collaboration performance of a consortium. Since the explained variable collaboration performance of the consortium is a continuous variable, the empirical analysis is carried out using a multiple linear regression model. The regression model is:

$$Y = \alpha + \beta_1 X_1 + \beta_2 X_2 + + \beta_3 X_3 + \beta_4 X_4 + \beta_5 X_5 + u \tag{4}$$

where: $Y$ represents the consortium collaboration performance, $X_1$ represents the resource allocation effect of benefit linkage, $X_2$ represents the capitalization effect of benefit linkage, $X_3$ represents the correlation effect of benefit linkage, $X_4$ represents the establishment years, $X_5$ represents the land scale, and $u$ is a random disturbance term, $\alpha$ is a constant term, and $\beta_i$ is the coefficient to be estimated.

## 4. Empirical Analysis

### *4.1. Reliability and Validity Test*

Through the reliability and validity analysis of the questionnaire, the Cronbach's $\alpha$ of resource allocation effect, capitalization effect, correlation effect, and consortium collaboration performance were 0.960, 0.952, 0.931, and 0.968, respectively, all exceeding the ideal level of 0.7, indicating that the measurement items had good reliability. In addition, the KMO of resource allocation effect, capitalization effect, correlation effect, and consortium collaboration performance measurement items were 0.898, 0.880, 0.826, and 0.940, respectively, which were more significant than 0.8, indicating that the measurement items had good validity.

### *4.2. Overall Regression Analysis*

It can be seen from Table 5 that the Durbin–Watson value of each variable was close to 2, indicating that the autocorrelation of variables was not apparent. According to the collinearity test, the VIF of each variable was less than 10, so there was no multicollinearity. The positive influence coefficients of resource allocation effect, capitalization effect, and correlation effect on the consortium collaboration performance were 0.093, 0.588, and 0.282, respectively, which were significant at the statistical levels of 5% and 1%, respectively. It can be seen that the three effects produced by the benefit linkage have a significant positive impact on consortium collaboration performance, so Hypothesis 1, Hypothesis 2 and Hypothesis 3 are verified. Through benefit linkage, the members of the consortium integrate and optimize internal resources, bring resource allocation advantages, reasonably allocate interests, mobilize the enthusiasm of all subjects to participate, improve production efficiency and quality, and at the same time, tighten the links between members to promote industrial integration and development, which have a positive impact on consortium collaboration performance.

### *4.3. Grouping Regression Analysis*

This study used the method of grouping regression analysis to test whether there are differences between joint-stock and non-joint-stock consortia in terms of the impact of resource allocation effect, capitalization effect, and correlation effect of benefit linkage on the collaboration performance of consortia.

It can be seen from Table 6 that the F values in regression models (1) and (2) were significant. According to models (1) and (2), the resource allocation effect, capitalization effect, and correlation effect of non-joint-stock consortium benefit linkage have a significant impact on the collaboration performance at the statistical levels of 1% and 5%, respectively, which shows that the benefit linkage effect of a non-joint-stock consortium is fully reflected. However, the resource allocation effect has no significant impact on the collaboration performance of the joint-stock consortium. The capitalization effect has a significant impact on the collaboration performance at the 1% statistical level with a coefficient of 0.476, which is significantly lower than that of the non-joint-stock consortium (the coefficient of capitalization effect on collaboration performance under a non-joint-stock consortium is 0.630). The impact of the correlation effect on collaboration performance is significant at the 1% statistical level, and the coefficient is 0.475, which is significantly higher than that of the non-joint-stock consortium (the coefficient of the correlation effect on collaboration performance under a non-joint-stock consortium is 0.170). Therefore, Hypothesis 4, Hypothesis 5 and Hypothesis 6 are verified.

**Table 5.** Regression analysis test and results.

| | | Non-Standardized Coefficient | | Standardized Coefficient | t | Sig. | Collinearity Statistics | |
|---|---|---|---|---|---|---|---|---|
| | | B | Standard Error | β | | | Tolerance | VIF |
| Control variables (Adjusted $R^2$ = 0.012 D-W = 1.730 F = 2.430 Sig. = 0.090) | Constant | 5.227 | 0.281 | | 18.631 | 0.000 | | |
| | Years of consortium establishment | −0.026 | 0.077 | −0.022 | −0.334 | 0.739 | 0.962 | 1.040 |
| | Scale of consortium land | 0.088 | 0.043 | 0.136 | 2.072 | 0.039 | 0.962 | 1.040 |
| Explanatory variables (Adjusted $R^2$ = 0.907 D-W = 1.896 F = 784.819 Sig. = 0.000) | Constant | 0.192 | 0.112 | | 1.723 | 0.086 | | |
| | Resource allocation effect | 0.094 | 0.039 | 0.099 | 2.409 | 0.017 | 0.230 | 4.344 |
| | Capitalization effect | 0.585 | 0.059 | 0.598 | 9.969 | 0.000 | 0.107 | 9.314 |
| | Correlation effect | 0.284 | 0.059 | 0.280 | 4.847 | 0.000 | 0.116 | 8.655 |
| Control variable+ Explanatory variables (Adjusted $R^2$ = 0.907 D-W = 1.895 F = 467.095 Sig. = 0.000) | Constant | 0.170 | 0.137 | | 1.245 | 0.215 | | |
| | Years of consortium establishment | 0.007 | 0.024 | 0.006 | 0.282 | 0.779 | 0.929 | 1.077 |
| | Scale of consortium land | 0.001 | 0.013 | 0.002 | 0.103 | 0.918 | 0.917 | 1.091 |
| | Resource allocation effect | 0.093 | 0.039 | 0.097 | 2.350 | 0.020 | 0.227 | 4.403 |
| | Capitalization effect | 0.588 | 0.060 | 0.601 | 9.775 | 0.000 | 0.103 | 9.717 |
| | Correlation effect | 0.282 | 0.060 | 0.278 | 4.711 | 0.000 | 0.112 | 8.946 |

**Table 6.** Grouping regression results of consortium organizational structure between benefit linkage effect and collaboration performance.

| Variable | Dependent Variable (Consortium Collaboration Performance) | |
|---|---|---|
| | Non-Joint-Stock Consortium | Joint-Stock Consortium |
| | Model (1) | Model (2) |
| Constant | 0.275 * (0.161) | −0.240 (0.245) |
| Years of consortium establishment | 0.006 (0.029) | 0.034 (0.044) |
| Scale of consortium land | −0.007 (0.017) | 0.016 (0.021) |
| Resource allocation effect | 0.153 *** (0.057) | 0.057 (0.048) |
| Capitalization effect | 0.630 *** (0.073) | 0.476 *** (0.098) |
| Correlation effect | 0.170 ** (0.078) | 0.475 *** (0.090) |
| Sample size | 179 | 62 |
| $R^2$ | 0.901 | 0.945 |
| Adjusted $R^2$ | 0.898 | 0.940 |
| F statistic | 315.101 *** | 192.216 *** |

Note: *, ** and *** represent significance at the significance levels of 10%, 5% and 1%, respectively; standard error in brackets.

### *4.4. Interpretation of Regression Results*

In a non-joint-stock consortium, usually the strongest body in the consortium, such as a company or cooperative society or co-operative, leads the operation of the consortium and establishes the benefit linkage through certain contractual methods, with different bodies dividing the work and collaborating, and each member having a clear functional orientation. According to the market demand, resources such as capital, technology, brand, information, etc. are reasonably deployed, and the free flow and integration of factors within the consortium promote standardized production and large-scale supply, form capital and brand linkages, develop new varieties and cultivate high-quality brands, enhance the intrinsic value of products, bring about the obvious effect of resource allocation, capitalization and correlation, and promote the complementary needs and functional integration among the subjects. It enhances the collaboration performance. However, the cooperation structure among the subjects in a non-joint-stock consortium is unreasonable, especially the composition norms. Although the non-joint-stock consortium has a common constitution and management norms, it is not an independent legal person, the property rights relationships of each member remain unchanged, the independence of each subject in the consortium is strong, the organizational structure is not close-knit enough, the stability of the benefit linkage is not strong, and joining or withdrawing from the consortium is relatively free [35]. Therefore, the non-joint-stock consortium is not very stable.

In the process of consortium development, some members form joint-stock consortia through different shareholdings, forming a stable asset linkage and enhancing the stability of the consortium. The joint-stock consortium is generally an independent legal entity, which establishes a more strict management system and strengthens the effective supervision and unified management of the operation process, and the members are more stable and have a stronger identity with the joint-stock consortium, so the correlation effect on collaboration performance under the joint-stock consortium is significantly higher than that of the non-joint-stock consortium. From the resource allocation effect, the various resources provided by members' shareholdings are fixed, and it is impossible for members to increase or decrease their factor inputs to the consortium. This model restricts the inflow or outflow of the consortium's factors, and the corporatized organizational structure and management norms also restrict the free flow of factors, so the resource allocation effect is weakened, and the resource allocation effect under the joint-stock consortium is not significant. From the perspective of the capitalization effect, with enterprises as the major shareholders and farmers as minority shareholders, there may be a situation that "major shareholders control generally and minority shareholders have low returns", and farmers are exploited by large enterprises because of capital disadvantage [36]. The unsound distribution of benefits reduces farmers' motivation to work, affects the overall productivity and product quality of the consortium, and inhibits the capitalization effect. In practice, the benefits of shareholding cooperation are not precisely quantified for individuals, and farm households do not fully share the dividends brought by large-scale land management and consolidation of collective operating assets into shares [37]. In addition, some enterprises only seek to obtain preferential policies given to the consortium by the government, and it is difficult to implement actual policies and projects for smaller-scale operating entities [10], which is even more detrimental to the capitalization effect of benefit linkages.

## 5. Conclusions and Suggestions

### *5.1. Conclusions*

The benefit linkage affects the collaboration performance of the consortium, and the resource allocation effect, capitalization effect, and correlation effect produced by the benefit linkage have a positive impact on the collaboration performance of the consortium. However, there are differences in the impact of the resource allocation, capitalization, and correlation effects on the collaboration performance of consortia with different organizational structures. From the perspective of the correlation effect, joint-stock consortia utilize shareholding and other means so that the benefits of the upper, middle and lower reaches

of the agricultural industry chain are more closely linked and more conducive to promoting the development and integration of primary, secondary, and tertiary industries. From the resource allocation effect and capitalization effect, non-joint-stock consortia are more conducive to promoting the flow of factors inside and outside the consortia, attracting farmers to join the consortia, and improving the enthusiasm of farmers to join the operation of the consortia. Therefore, according to its establishment purpose and collaboration objectives, a consortium with different types of organizational structures should be established to effectively improve its collaboration performance.

### *5.2. Suggestions*

First, different types of consortia should establish stable and sustainable benefit linkages, including financial linkages, technical linkages, brand linkages, service linkages, etc., to achieve reasonable benefit distribution and form a community of benefit, so as to better bring into play the benefit linkage effect and promote their own collaboration performance.

Second, there are gaps in the benefit linkage of different organizational structures of consortia, which have different degrees of influence on collaboration performance; thus, the choice of the organizational structure of the consortium should be based on the needs and purposes of collaboration to maximize its collaboration performance.

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