



## ARTICLE

# The Impact of Market Orientation and Self-Perception on the Heterogeneity of Cooperative Members: Analysis Based on Structural Equation Modeling

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## Abstract

Effective governance and operation of cooperatives will play an important role in rural revitalization. Taking Henan Province as an example, this paper uses structural equation model to analyze the impact of external market orientation and internal self-awareness on the heterogeneity of farmers' professional cooperatives. It is concluded that the formation of the heterogeneity of farmer specialized cooperative members is not only caused by the influence of external market factors, but also caused by the difference in the degree of self-cognition of members. Moreover, the influence degree of market factors is greater than that of members' self-cognition, and the direct influence effects are 0.592 and 0.192 respectively. In the market orientation, the attainment of more market benefits, the need to improve market competitiveness, the satisfaction of different customer needs in the market and the success of cooperation among market cooperatives or other organizations will aggravate the degree of member heterogeneity. The higher the degree of self-cognition on the value of cooperatives, the necessity of scientific internal governance of cooperatives, the demand for profits in cooperatives and the more knowledge on the relevant laws of

cooperatives will increase the possibility of the formation of member heterogeneity.

**Keywords:** Market orientation, Self-perception, Heterogeneity of members | Research background.

## Citation

Zhao, L., & Liu, S. (2024). The Impact of Market Orientation and Self-Perception on the Heterogeneity of Cooperative Members: Analysis Based on Structural Equation Modeling. *IECE Transactions on Social Statistics and Computing*, 1(1), 61–71.

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## 1 Research background

China's economic development has entered a new normal, and the development of agriculture and rural areas has entered a new stage of the integration of three industries. It is urgent to make up the "short board" of agricultural development and promote the modernization of agriculture with Chinese characteristics. It is also urgent to have a dynamic economic organization to help solve these problems. As a major agricultural province, the number of farmers' specialized cooperatives has increased rapidly, which has brought new growth impetus for the development of agricultural economy in Henan Province. However, in reality, the quality of the development of cooperatives is not as satisfying as the quantity, resulting in the emergence of the so-called "real" and "fake" cooperatives, "deck" cooperatives and other phenomena, and the management of many cooperatives is not strictly in accordance with the provisions of the law to implement, "breach of contract", "abandon the contract" phenomenon occurs from time to time, directly affect the healthy development of cooperatives and the smooth implementation of the rural revitalization strategy.

Academic Editor:  
HangYuan Guo

Submitted: 6 May 2024  
Accepted: 23 May 2024  
Published: 2 June 2024

Vol. 1, No. 1, 2024.  
 10.62762/TSSC.2024.184862

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These problems have attracted the attention of relevant experts and scholars, and believe that the generation of these problems has a great relationship with the heterogeneity of cooperative members. Member heterogeneity is an inevitable market-oriented phenomenon in the development of cooperatives, which can be benign cooperation among members or mutual killing and harm among members [1]. If enough attention is not paid to member heterogeneity, it will be difficult for cooperatives to go on the road of healthy, standardized and sustainable development. The phenomenon of cooperation but not cooperation in name only cannot be fundamentally changed [2]. Many scholars have also explained how cooperatives should be managed from the perspective of member heterogeneity, and obtained rich results. However, one prerequisite question has been neglected, that is, what is the root cause of member heterogeneity, what factors affect member heterogeneity, how much the influence is, and how the influence mechanism is. These are real problems facing cooperative managers and government departments.

## 2 Literature review

The homogeneity or heterogeneity of organizational members is a traditional field in the study of the efficiency of collective organizations. Since LeVay (1983), more and more researchers and experts on agricultural cooperatives have paid [3] attention to the heterogeneity of members. Many scholars have noticed that the existence of member heterogeneity has an important impact on the governance structure, performance appraisal, surplus distribution and other aspects of cooperatives [4–7]. The emergence and evolution of cooperatives in China are determined by special national conditions, and their development process can be regarded as the transition of development stage caused by the evolution of multi-factor cooperation [8]. The heterogeneous differentiation of cooperative members occurs in the transition process from public collective to private market. Therefore, the causes of the heterogeneity of peasant cooperative members in China are very complex, and with the development of the cooperative itself, the degree of heterogeneity of peasant cooperative members is not but will not weaken, but may become more obvious; Heterogeneity of members has both positive and negative impacts on the development of farmer cooperatives [2]. Iliopoulos and Valentinov (2022) believed that cooperatives with heterogeneous members can also cooperate

as long as certain expected revenue conditions can be met, and measures such as moderately enhancing information asymmetry and trust between members are conducive to maintaining long-term and stable cooperation among heterogeneous members [9]. However, Galbraith and Rodriguez (2007) argued that the heterogeneity of cooperative members would have a negative impact [10] on principle-agent, offsetting economies of scale, increasing costs of decision-making and contracting, and incentive for scarce resources and fair balance. Therefore, the rationality of the internal governance of cooperatives under the condition of heterogeneity of members should be paid attention to [11–14].

Many scholars have put forward valuable opinions on some aspects of member heterogeneity, which also provides a lot of good ideas for this study. However, in terms of research literature, most scholars have observed that the phenomenon of member heterogeneity does exist in farmer specialized cooperatives, but there are different opinions on the reasons for the heterogeneity. Most scholars' research is carried out from one aspect, or they regard the heterogeneity of cooperative members as the inherent resource endowment difference of members, but ignore the influence of market, internal or legal characteristics outside the individual itself, and even the acquired differentiation of member heterogeneity is not involved. Especially in the context of remarkable changes in China's internal environment, the solution of these problems is very important for the correct guidance and healthy development of farmers' specialized cooperatives in China.

## 3 Theoretical basis and research hypothesis

### 3.1 Market orientation and member heterogeneity

Hart and Moore (1996) found obvious differences by comparing the efficiency of IOF organizations and specialized farmer cooperatives. Through further research, they found that the greater the degree of market competition is, the higher the degree of member heterogeneity is. When the market competition is relatively moderate, the degree of heterogeneity of the internal members is relatively low or the homogeneity of the internal members is high, and the efficiency of the cooperative organization will be significantly improved [15]. When analyzing the heterogeneity of cooperative members, Iliopoulos et al. (1999) summarized the causes of its formation into five aspects, among which the analysis focused on the production strategy of members, the position of

members in the industrial chain, the market strategy [16] adopted by diversified operation and product innovation. Liang et al. (2022) found the differences in the roles of members of farmer cooperatives through analysis, and judged that the main motivation of members of farmer specialized cooperatives was the result of induced institutional change driven by "leaders" to obtain market benefits [17]. Panteley and Loría(2017) pointed out that one of the reasons for the emergence of specialized farmer cooperatives in China is that they gradually accumulated advantages in capital, technology, market and information during the experience of market economy. After returning to their hometown, they established a leading position in the local agricultural field and became "capable people" [18]among agricultural producers and operators. Among them, there are not only small farmers in the traditional sense, but also specialized and large-scale professional farmers oriented by the market. As a formal economic organization, the farmers' professional cooperative is an important goal for both the organization itself and the members of the cooperative. In order to obtain more profits and avoid "big farmers eating small farmers", which will damage the rights and interests of small farmers, different members will make full use of their own resources, and there are differences in personal endowments, social resources, production resources and other aspects.

It can be seen that the original intention of the existence of cooperatives is to help small farmers resist the risk of the large market. The influencing factors in the market can be said to be quite important, and the development of cooperatives as economic organizations needs to face the large market, so there are quite a lot of uncertain factors in the market that affect the development of cooperatives. The most obvious influence is the interests in the market. According to the law on cooperatives, they do not make profits internally, but they can make profits externally, which not only guarantees the income of their members, but also meets the needs of their self-development. Uncertainties in the market are always accompanied by risks. In order to obtain more profits, more knowledge and experience of market management are needed, which is not available to farmers engaged in agricultural production at the front line. Therefore, more relevant personnel are needed to participate in the cooperative, forming the heterogeneity of members. The need for market competition and cooperation, and the need for management experience such as customer relationship

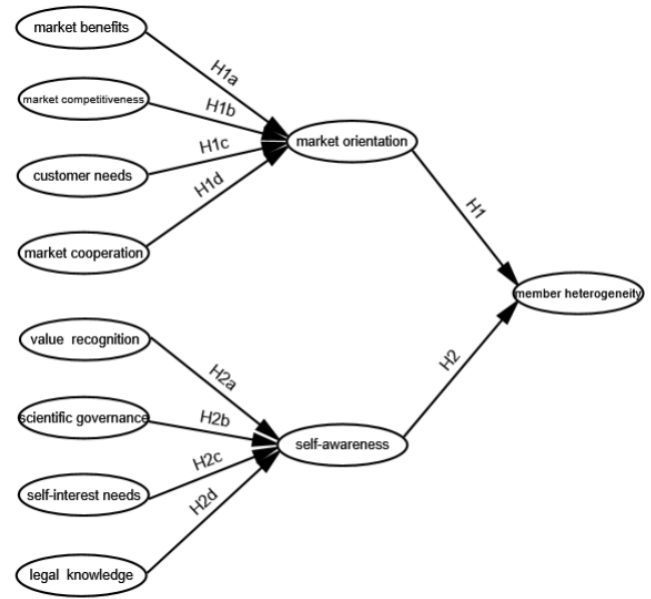


Figure 1. The theoretical model

Table 1. Forest fire classification table.

Type of cooperative	Quantity
Planting	190
Farming	102
Processing	45
Aquatic products	42
Agricultural services (including land and finance)	65
Others	35
Total	479

maintenance methods in the market will further aggravate the cooperative's need for non-agricultural producers. Based on this, the following hypotheses are put forward:

- H1:** The need for market orientation is positively related to the formation of member heterogeneity.
- H1a:** The demand for benefits plays an important role in market orientation.
- H1b:** The need for market competitiveness will significantly affect market orientation.
- H1c:** The degree of satisfaction of customer needs in the market will significantly affect market orientation.
- H1d:** The need for market cooperation among cooperatives will significantly affect market orientation.

**Table 2.** Basic description of the characteristics of the respondents

Characteristics	Percentage%	Characteristics	Percentage%
Age	Under 30	Education level	Junior high school and below
	30~40		high school
	40~50		Technical secondary school and above
	50~60		No
	Over 60		Army Conversion
Gender	male	Special Social Experiences	Former village cadre
	female		Working outside the home
	Unmarried		Others
Married	Married	Whether he is the chairman of the cooperative	yes
			No

**3.2 Self-cognition and member heterogeneity**

The cognition and research on member heterogeneity is not a very new content. It is just that the heterogeneity and changes are occurring in different historical periods due to the changes of internal and external conditions of cooperatives. When analyzing the characteristics of member heterogeneity, Song (2016) regarded the motivation of members as a very important point, and believed that if members have more understanding of the nature and internal management of the cooperative before, during and after joining the cooperative, the degree [19] of heterogeneity will be increased. At present, there are a large number of cooperatives in China, and the competition among cooperatives is increasingly intensified. In order to improve the competitiveness of cooperatives, modern and scientific management methods are needed, while the quality of traditional producers can not meet the needs of competition to a large extent. If the members of the cooperative have a full understanding of the value of the existence of the cooperative, the relevant laws of the cooperative, and how to better obtain more benefits from the cooperation and improve the internal management, they can deal with the problem [2] of member heterogeneity rationally. Based on this, the following hypotheses are put forward:

**H2:** The need for self-awareness of members is positively correlated with the formation of member heterogeneity.

**H2a:** Full recognition of the existence value of a cooperative will significantly affect self-perception.

**H2b:** The full cognition of the connotation of scientific governance in cooperatives will significantly affect the self-cognition of members.

**H2c:** The full cognition of the relationship between cooperative and members' self-interest needs will significantly affect members' self-cognition.

**H2d:** The degree of cognition of legal knowledge related to cooperatives will significantly affect members' self-cognition.

According to the above hypotheses, the theoretical model proposed for the study is shown in Figure 1.

**4 Data description and sample characteristics**

**4.1 Data Description**

The data used in this part of the research are obtained from November to December 2023 by the members of the research group in Henan Province, a new professional farmer training base Henan Agricultural High-tech Park, and 500 representatives of farmers' professional cooperatives. A total of 500 questionnaires were distributed and 490 questionnaires were recovered, with a recovery rate of 98%. Through the processing and screening of

questionnaires, 479 questionnaires were valid, with an effective rate of 98%, which met the basic requirements of the quantity and quality of questionnaires required by this study.

## 4.2 Sample characteristics

The survey samples in this study are assigned by superiors according to different regions, so the distribution correlation is broad. Therefore, the research results are relatively more guiding. Through the investigation, it is found that the samples cover planting, breeding, aquatic products, new services, agricultural production and processing and other industries. The main types of farmer specialized cooperatives are shown in Table 1.

As can be seen from Table 1, there are many planting cooperatives in the survey respondents, accounting for about 40%, breeding about 21%, agricultural production and processing accounted for 9%, aquaculture also accounted for 9%, agricultural service cooperatives include new land transfer, management and financial loan cooperatives, accounting for about 14%, other types of cooperatives accounted for about 7%. The diversity of samples can make the results of this study more representative.

## 4.3 Basic description of respondents' characteristics

As can be seen from Table 2, the respondents aged below 30, 30-40, 40-50, 50-60 and above accounted for 2.6%, 21.3%, 45.7%, 23.9% and 6.5%, respectively. Among them, 65.2% were directors of cooperatives, and 83.3% had a high school education or above. 25.2% of them had been engaged in agricultural production, and 74.8% of them had special social experience. It can be seen from the data that there are obvious differences among the individuals in the sample.

## 5 Econometric test

### 5.1 Variable description and descriptive analysis

Based on the aforementioned literature and hypothesis theory, we make a judgment and define the variables according to the homosexual love situation reflected by the variables. The endogenous latent variables are market orientation and self-cognition, while the exogenous latent variables are market competition, market interest, market cooperation, market customers, cognition of the existence value of the cooperative, internal governance of the cooperative, self-interest demand acquisition, and relevant laws of the

cooperative. Since these variables cannot be measured directly, they must be explained by other measurable variables. According to the requirements of the structural equation, one latent variable needs at least two measurable variables, and the variable selection in this paper basically meets the requirements. The five-point Likert scale is adopted in the design of items, including strongly agree, agree, general, disagree and strongly disagree. Based on the existing literature, each measurement dimension is designed and adjusted according to the research needs of this paper. The specific variable description is shown in Table 3.

### 5.2 Reliability test and validity test

In this part, SPSS24.0 was used to conduct KMO and Bartlett test on the questionnaire data. The overall KMO value was 0.921, and the Bartlett test statistic was significant at the level of 0.001%, indicating that the questionnaire data were suitable for factor analysis. The reliability test results of questionnaire data show that (Table 3), the overall Cronbach's  $\alpha$  value is 0.908, indicating that the internal consistency of the total scale is good. The results of confirmatory factor analysis showed that the factor loading of each observation item ranged from 0.654 to 0.893, which was greater than 0.5, indicating that the items of the research model had a high level of reliability. The combined reliability C.R. ranged from 0.701-0.845, which was greater than the threshold value of 0.7, indicating that the internal consistency of each variable was high and basically met the requirements of research analysis. In addition, the Average variance extracted (AVE) of each latent variable was between 0.539 and 0.643, which was greater than 0.5, indicating that the questionnaire scale had good composite reliability and convergent validity. At the same time, as shown in Table 4, the square root of AVE is greater than the correlation coefficient between the variable and other variables, indicating that there is no significant difference between the latent variables, so the discriminant validity of the scale is good. Therefore, the measurement scale in this study has good reliability and validity.

Table 3. Sample reliability, validity and factor analysis

Latent variable	Observable variables	Standard factor loadings	Cronbach's $\alpha$	CR	AVE		
Market orientation refers to: Luo et al.,2023; Rana Faizan Gui,2023.	Market Benefits	My cooperative in the region is more profitable than other cooperatives (A1)	0.876	0.782	0.793	0.566	
		The main leaders of the cooperative contributed relatively more to the profitable process of the cooperative(A2)	0.728				
		How much profit do I make in the cooperative is directly proportional to my turnover (volume) or patronage(A3)	0.633				
	Market Competition	Compared with other similar cooperatives, my cooperative has stronger market competition (B1)	0.825	0.753	0.839	0.637	
		The members of the cooperative council on which I always come up with ways to improve market competitiveness (B2)	0.837				
		The Cooperative council to which belongs often consults with the representatives of the cooperative members when formulating the competitive strategy of the cooperative (B3)	0.728				
	Customer Demand	The products of my cooperative have a large sales volume in the market(C1)	0.793	0.876	0.841	0.639	
		I do not sell my products elsewhere then the cooperative (C2)	0.728				
		Sales of products of my cooperative in the market The market is large (C3)	0.872				
	Market Cooperation	My cooperative often carries out cooperative activities with other cooperatives (D1)	0.766	0.733	0.802	0.576	
		My cooperative often carries out business docking with related enterprises (D2)	0.702				
		My cooperative has attracted outside investments.(D3)	0.805				
Member's self-cognition reference: LiuYuying,2019; Liu Meiling,2022; ZhengJingyuan, 2024.	The cognition of Existence value of cooperatives	I can explain what a cooperative is.(E1)	0.754	0.856	0.816	0.598	
		I know why to join the Cooperative(E2)	0.808				
		I joined the cooperative by choice(E3)	0.803				
	Perceptions of governance Within the cooperative	I think the management of cooperatives need people other than agricultural producers to participate in the management (F1)	0.772	0.655	0.843	0.643	
		Cooperatives need new management methods. (F2)	0.814				
		The cooperative I work in has received support and help from the government (F3)	0.819				
	Need perception of self-interest	I am satisfied with the compensation is given by my cooperative (G1)	0.745	0.897	0.701	0.539	
		I think individual agricultural producers can better avoid market risks only by joining economic organizations (G2)	0.724				
	Relevant legal cognition	I know the law of Cooperatives (H1)	0.728	0.654	0.720	0.562	
		I often use cooperatives to protect my legal rights and interests (H2)	0.772				
	Member heterogeneity reference: ZhengJingyuan, 2024; Lou et al., 2014; Huang et al.,2019.		The members of my cooperative are all agricultural producers (J1)	0.766	0.851	0.845	0.578
			The proportion is the same as required by the Law on Specialized Farmers Cooperatives(J2)	0.802			
I often participate in the decision making of the cooperative (J3)			0.810				

## 6 Structural equation Model path analysis and fitting

### 6.1 Path coefficient of the model

In this study, the Maximum Likelihood estimation was used to calculate the model. The estimated results showed that there were several path coefficients with the same influence direction as the hypothesis, but the test results were not significant. Further analysis of the variance estimation results showed that the test was not significant, and the fitting indexes were shown in Table 5.

Therefore, according to the model path coefficient and the fitting test results, there is still room for adjustment of the fitting results of some indicators of the model.

### 6.2 Modification of the model

When analyzing the results of the structural equation, the significance of the path coefficient of the model and the rationality of each fitting index are very important, but more important is that the analysis of the model conclusion must have relevant theoretical basis, that is, the premise of model modification must have certain theoretical significance. When the model effect is very poor, we can refer to the Modification Index in AMOS to adjust the model. When using the modification index to modify the model, in principle, only one parameter should be modified at a time, and the estimation should start from the maximum value [20].

### 6.3 Estimation results of the optimal model

#### 6.3.1 Estimation results of the optimal model

Based on the scientific and reasonable modification of the model, the estimation results of the optimal model are obtained, as shown in Table 6.

#### 6.3.2 Optimal model fitting index

It can be seen from the estimation results in Table 6 and Table 7 that the fitting indexes of the model meet the requirements, the variance estimation results also pass the test, and the path coefficients among the latent variables also pass the significance test, indicating that the above results can be used to test and analyze the hypotheses mentioned above.

#### 6.3.3 Effect analysis of endogenous latent variables

It can be seen from Figure 2 that the direct effect of the latent variable of market orientation on the heterogeneity of members is 0.592, indicating that if other conditions remain unchanged, the latent variable of "market orientation" will directly increase

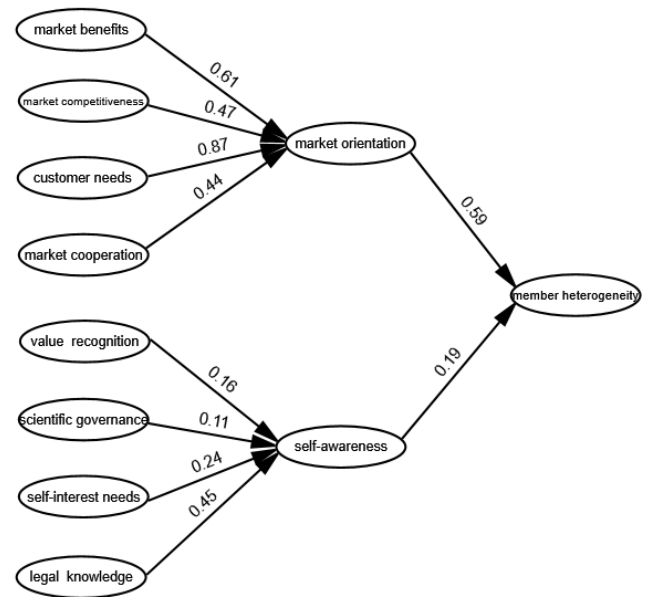


Figure 2. The path coefficient estimates

by 0.592 units for every unit increase of the latent variable of "heterogeneity of members"; The direct effect of the latent variable of self-cognition on the heterogeneity of members is 0.192, indicating that if other conditions remain unchanged, the latent variable of "self-cognition" will directly increase the latent variable of "heterogeneity of members" by 0.192 units for every unit increase of the latent variable of "self-cognition". The hypotheses H1 and H2 in the previous paper were verified respectively.

### 6.4 Analysis of Results

The path coefficients of latent variables from Table 6 above are shown in Figure 2 below.

#### 6.4.1 Effect analysis of exogenous latent variables

At the same time, it can be seen that the influence coefficients of market interest, market competition, market customer and market cooperation on the exogenous latent variables of each market orientation are as follows: 0.614, 0.470, 0.868 and 0.437, indicating that if other conditions remain unchanged, each one unit increase of market interest, market competition, market customer and market cooperation will increase the latent variable of market orientation by 0.614, 0.470, 0.868 and 0.437 units respectively; The path coefficients of the influence of cooperative value, internal governance, self-interest and relevant laws on the exogenous latent variables of self-cognition are 0.164, 0.113, 0.235 and 0.447, respectively. It shows that if other conditions remain unchanged, each unit increase of cooperative value, internal governance, self-interest and related legal variables will increase the

**Table 4.** Pearson correlation test of variables and square root of AVE

	X1	X2	X3	X4	X5	X6	X7	X8	X9
X1	0.566								
X2	0.598**	0.637							
X3	0.514**	0.565**	0.639						
X4	0.480**	0.511**	0.497**	0.576					
X5	0.472**	0.217**	0.305**	0.448**	0.598				
X6	0.625**	0.633**	0.558**	0.476**	0.516**	0.643			
X7	0.389**	0.497**	0.362**	0.467**	0.329**	0.344**	0.539		
X8	0.491**	0.497**	0.518**	0.504**	0.512**	0.509**	0.535**	0.562	
X9	0.523**	0.512**	0.520**	0.523**	0.528**	0.511**	0.516**	0.516**	0.578

Notes: \*\* Significant correlation at the 0.01 level (two-sided). X1-X9 indicate that the measured variables are market interests, market competition needs, customer needs, market cooperation, cognition of the existence value of cooperatives, cognition of the internal governance of cooperatives, cognition of self-interest needs, cognition of relevant laws, and member heterogeneity. The value on the diagonal is the square root of AVE.

**Table 5.** Fitting index

Index name	Evaluation criteria	Fitting results		
Absolute fit index	$\chi^2/df$	Less than 3	3.25	
	IFI	Greater than 0.9	Less than 0.05, the	0.854
	RMR	smaller the better	Less than 0.05, the	0.054
	RMSEA	smaller the better	Greater than 0.9, the	0.016
	NFI	closer to 1 the better	Greater than 0.9, the	0.906
Information index	CFI	closer to 1 the better	the smaller the	0.913
	AIC	better.		397.326

latent variable of self-cognition by 0.164, 0.113, 0.235 and 0.447 units respectively. The hypotheses H1a, H1b, H1c, H1d and H2a, H2b, H2c, H2d in the previous section are verified respectively.

*6.4.2 Effect analysis of measurement variables*

It can be seen from Table 6 of the path coefficient estimation of the optimal model that among all the measured variables, only A1 and A2 fail the significance test at the level of 0.01, and the P test values are 0.010 and 0.019 respectively, but the t test is greater than 2, which means that if the test standard is relaxed, they will certainly pass the test. However, it is also possible that the two variables A1 and A2 have obvious indirect effects on the interpretation of their latent variables. The variable represented by A1 is "my cooperative is more profitable than other similar cooperatives in the region". When influencing the market orientation variable, this variable may also obtain the profits from other variables or the selected sample cooperatives not only from the market,

but also from other sources, such as social donation and state support [21]. The variable represented by A2 is "the main leaders of the cooperative have a relatively large contribution in the profit making process of the cooperative," indicating that the acquisition of market interests of the sample cooperative is directly related to the transaction volume or patronage volume of the main producers, while the ability and level of the main management in the cooperative have little influence. At the same time, it can also be seen that the path coefficients of some measurement variables in the estimation table of path coefficients of the optimal model are negative. The reason is that the selected variables are negatively correlated with the corresponding latent variables, that is, these variables may represent the homogeneity phenomenon of sample cooperatives, which indicates that some cooperatives in the sample show obvious homogeneity in some aspects. Generally speaking, the higher the degree of homogeneity of the members is, the higher the efficiency of the internal management of



**Table 6.** Path coefficient estimation of the optimal model

		Estimates of path coefficients were not standardized			S.E.	C.R.	P	Standardized path coefficient estimates
Market orientation	—	Market interest	1.080	0.125	8.618	***	0.614	
Market orientation	—	Market competition	0.236	0.033	7.257	***	0.470	
Market orientation	—	Customer Demand	2.155	0.218	9.875	***	0.868	
Market orientation	—	Market Cooperation	0.632	0.093	6.827	***	0.437	
Self-awareness	—	The cognition of the Existence value of cooperatives	0.335	0.099	3.382	***	0.164	
Self-awareness	—	Percepti ons of governance Within the cooperative	7.080	3.385	2.091	***	0.113	
Self-awareness	—	Need perception of self-interest	0.275	0.048	5.742	***	0.235	
Self-awareness	—	Relevant legal cognition	0.509	0.128	3.971	***	0.447	
Heterogeneity of members	—	Market orientation	0.001	0.001	2.409	***	0.192	
Heterogeneity of members	—	Self-awareness	0.643	0.058	11.037	***	0.580	
A1	—	Market orientation	0.159	0.068	2.354	0.019	0.040	
A2	—	Market orientation	-0.246	0.096	-2.568	0.010	-0.034	
A3	—	Market orientation	1.852	0.341	5.436	***	0.133	
B1	—	Market orientation	-0.362	0.098	-3.698	***	-0.076	
B2	—	Market orientation	1.317	0.223	5.895	***	0.172	
B3	—	Market orientation	-0.284	0.061	-4.639	***	-0.08	
C1	—	Market orientation	1.636	0.272	6.006	***	0.203	
C2	—	Market orientation	0.236	0.477	0.495	***	0.005	
C3	—	Market orientation	-0.642	0.116	-5.555	***	-0.125	
D1	—	Market orientation	0.825	0.151	5.481	***	0.109	
D2	—	Market orientation	0.045	0.042	1.077	***	0.013	
D3	—	Market orientation	1				0.094	
E1	—	Self-awareness	-0.486	0.051	-9.456	***	-0.578	
E2	—	Self-awareness	0.355	0.061	5.852	***	0.334	
E3	—	Self-awareness	1.218	0.122	9.955	***	0.669	
F1	—	Self-awareness	0.155	0.023	6.859	***	0.420	
F2	—	Self-awareness	0.867	0.084	10.28	***	0.672	
F3	—	Self-awareness	0.187	0.044	4.259	***	0.223	
G1	—	Self-awareness	-0.01	0.011	-0.896	***	-0.044	
G2	—	Self-awareness	-0.033	0.024	-1.405	***	-0.070	
H1	—	Self-awareness	0.165	0.031	5.339	***	0.268	
H2	—	Self-awareness	1				0.667	
J1	—	Heterogeneity of members	1				0.010	
J2	—	Heterogeneity of members	0.340	0.100	3.463	0.002	0.402	
J3	—	Heterogeneity of members	1.106	0.223	5.179	***	0.182	

Note :\*\*\* indicates significance at the 0.01 level, and the corresponding C.R value, ort-value, is in parentheses.

**Table 7.** Calculation results of the commonly used fitting index of the optimal model

Fit index	$\chi^2/df$	CFI	NFI	IFI	RMSEA	AIC	RMR
Results	2.35	0.962	0.914	0.951	0.051	345.909	0.0412

the cooperative is, and the governance structure of the cooperative is relatively simple. Therefore, with the continuous development and improvement of cooperatives and the continuous improvement of various rules and regulations of cooperatives, the heterogeneity and homogeneity among members can form consistency to a certain extent or under certain conditions. For example, although there are differences in the roles of cooperative members, they should be consistent in terms of interest acquisition. These phenomena cannot be directly

regarded as alienated or pseudo-shaped cooperatives, but innovative forms with Chinese local characteristics [22].

## 7 Conclusion and countermeasure

### 7.1 Conclusion

This paper takes Henan Province as a sample, and selects 25 measurement variables to analyze the impact of market orientation and members' self-cognition on the heterogeneity of farmers' specialized cooperatives. The results show that both market orientation and self-cognition have a significant impact on the formation of member heterogeneity, and the direct effect is 0.592 and 0.192, respectively. It is further concluded that: (1) The formation of member heterogeneity of farmer specialized

cooperatives is not only influenced by external market factors, but also by the difference of members' self-cognition.(2).In the external market orientation, the acquisition of more market benefits, the need to improve market competitiveness,the satisfaction of different customer needs in the market and the success of cooperation among market cooperatives or other organizations will aggravate the degree of member heterogeneity.(3).The higher the degree of self-cognition on the value of cooperatives, the more the necessity of scientific internal governance of cooperatives, the more the ways for members to profit from cooperatives and the more the relevant laws of cooperatives will increase the possibility of member heterogeneity.(4).At present, both heterogeneity and homogeneity of members exist in cooperatives,and from the perspective of members,heterogeneity and homogeneity are contradictory opposites and unity.In terms of the management and benefit distribution of cooperatives, members do not want more "outsiders" to participate,but in the process of participating in the market competition, due to their own limited ability level,they also hope that someone can give more support and help. (5).With the continuous improvement of various laws and regulations and the continuous improvement of marketization degree, homogeneity and heterogeneity will tend to be unified, for example, in the acquisition of benefits can draw on each other's strengths.

## 7.2 Countermeasures

According to the analysis of the above conclusions, in order to better promote the healthy development of farmer specialized cooperatives, the following countermeasures are proposed:(1).Correctly treat the heterogeneity of cooperative members. No matter ordinary members, managers or government departments of cooperatives, they should treat the phenomenon of member heterogeneity correctly in ideology.Only by recognizing the practical significance of its existence can it be better utilized legally and more conducive to realizing the value or goal of the cooperative. We should respect market rules and reasonably guide the influence of undesirable heterogeneity.(2).Encourage cooperatives to actively participate in market activities. In order to better obtain benefits and protect the legitimate rights and interests of members in participating in market activities,cooperatives can make full use of the advantages of heterogeneity of members, especially in the face of market risks,to pool wisdom, to minimize risks and make more profits.(3).Strengthen

the training of members.As a cooperative manager,it is necessary to conduct regular training for members, not only in terms of production technology, but also in terms of modern operation and management,laws and regulations,etc.,so that members can fully understand the value of the cooperative and correctly deal with heterogeneity issues.(4).Improve laws and regulations and strengthen supervision. Cooperatives exist to reduce the risks of individual producers in the market in order to obtain the maximum possible profit, so any factor that can help them achieve these goals can be used. However, due to the differences in the motivation and individual resources of the members, if they can not be correctly guided, they will deviate from these goals.Therefore, the government supervision department should constantly improve the relevant laws and regulations.

## Conflicts of Interest

The authors declare that they have no conflicts of interest.

## Acknowledgement

This work was supported without any funding.

## References

- [1] Zheng J Y.(2024).Heterogeneous disease of cooperative members: symptoms, diagnosis and legal prescription[J].*Journal of Tsinghua University (Philosophy and Social Sciences Edition)*,39(01):170-181+241 [CrossRef]
- [2] Iliopoulos, C., & Valentinov, V. (2018). Member heterogeneity in agricultural cooperatives: A systems-theoretic perspective. *Sustainability*, 10(4), 1271. [CrossRef]
- [3] LeVay, C. (1983). Agricultural co-operative theory: A review. *Journal of agricultural economics*, 34(1), 1-44. [CrossRef]
- [4] Karantininis, K., & Zago, A. (2001). Endogenous membership in mixed duopsonies. *American Journal of Agricultural Economics*, 83(5), 1266-1272. [CrossRef]
- [5] Grashuis, J., & Cook, M. L. (2021). Members of cooperatives: more heterogeneous, less satisfied?. *International Food and Agribusiness Management Review*, 24(5), 813-825. [CrossRef]
- [6] Grashuis, J., & Su, Y. (2019). A review of the empirical literature on farmer cooperatives: Performance, ownership and governance, finance, and member attitude. *Annals of Public and Cooperative Economics*, 90(1), 77-102. [CrossRef]
- [7] Huang, Z., & Liang, Q. (2018). Agricultural organizations and the role of farmer cooperatives in

- China since 1978: Past and future. *China Agricultural Economic Review*, 10(1), 48-64. [CrossRef]
- [8] Yang, H., Klerkx, L., & Leeuwis, C. (2014). Functions and limitations of farmer cooperatives as innovation intermediaries: Findings from China. *Agricultural Systems*, 127, 115-125. [CrossRef]
- [9] Iliopoulos, C., & Valentinov, V. (2022). Cooperative governance under increasing member diversity: Towards a new theoretical framework. *Scandinavian Journal of Management*, 38(1), 101192. [CrossRef]
- [10] Galbraith, C. S., Rodriguez, C. L., & Stiles, C. H. (2007). Social capital as a club good: the case of ethnic communities and entrepreneurship. *Journal of Enterprising communities: people and places in the global economy*, 1(1), 38-53. [CrossRef]
- [11] Cossey, J., Billiet, A., Dufays, F., & Bruneel, J. (2023). How Do Institutional Prescriptions (Fail to) Address Governance Challenges Under Institutional Hybridity? The Case of Governance Code Creation for Cooperative Enterprises. *Journal of Business Ethics*, 1-20. [CrossRef]
- [12] Guo, Z., Chen, X., & Zhang, Y. (2022). Impact of environmental regulation perception on farmers' agricultural green production technology adoption: a new perspective of social capital. *Technology in Society*, 71, 102085. [CrossRef]
- [13] Wu, F., Guo, X., & Guo, X. (2023). The impact of cooperative membership on family farms' income: evidence from China. *Applied Economics*, 55(55), 6520-6537. [CrossRef]
- [14] Huang S Z, Fu H Y.(2019) Corporation-led farmer cooperatives: Social exchange, trust dilemma and mixed governance. *Issues in Agricultural Economy*,(02):53-62.
- [15] Hart, O., & Moore, J. (1996). The governance of exchanges: members' cooperatives versus outside ownership. *Oxford review of economic policy*, 12(4), 53-69. [CrossRef]
- [16] Iliopoulos, C., & Cook, M. L. (1999). The internal organization of the cooperative firm: An extension of a new institutional digest. *Journal of Cooperatives*, 14, 77-85. [CrossRef]
- [17] Liang, Q., Dong, H., Bailey, A. R., Hu, W., & Jia, F. (2022). Exploring multiple drivers of cooperative governance: a paired case comparison of vegetable growing cooperatives in the UK and China. *International Food and Agribusiness Management Review*, 25(4), 651-670. [CrossRef]
- [18] Panteley, E., & Loría, A. (2017). Synchronization and dynamic consensus of heterogeneous networked systems. *IEEE Transactions on Automatic Control*, 62(8), 3758-3773. [CrossRef]
- [19] Song, J. (2016). Innovation ecosystem: impact of interactive patterns, member location and member heterogeneity on cooperative innovation performance. *Innovation*, 18(1), 13-29. [CrossRef]
- [20] Martynova, E., West, S. G., & Liu, Y. (2018). Review of principles and practice of structural equation modeling. *Structural Equation Modeling: A Multidisciplinary Journal*, 25(2), 325-329. [CrossRef]
- [21] Zhang, Y. Y., Ju, G. W., & Zhan, J. T. (2019). Farmers using insurance and cooperatives to manage agricultural risks: A case study of the swine industry in China. *Journal of Integrative Agriculture*, 18(12), 2910-2918. [CrossRef]
- [22] Hui, E. C. M., Bao, H. J., & Zhang, X. L. (2013). The policy and praxis of compensation for land expropriations in China: An appraisal from the perspective of social exclusion. *Land Use Policy*, 32, 309-316. [CrossRef]