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A study on the participation of family farms in order-based agriculture in the southwest mountainous regions of China: A social capital perspective

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Abstract: Order-based agriculture aligns with the fundamental requirements for the high-quality development of modern agriculture in the new era. This study investigates how social capital influences the participation of family farms in order-based agriculture across the mountainous regions of southwestern China. Drawing on survey data from 557 farms and employing logit and Karlson-Holm-Breen (KHB) mediation effect models, the research reveals that social capital significantly promotes participation. Specifically, stronger social networks, heightened trust, and established norms are associated with increased engagement. While access to information mediates this relationship, the direct effect of social capital remains predominant. These findings underscore the importance of enhancing both social capital and information accessibility to encourage greater involvement among family farms. Furthermore, targeting younger and middle-aged farmers engaged in single-product production is crucial for promoting sustainable development.

Keywords: information accessibility; mediation effect; social network; social norms; social trust

Order-based agriculture, which originated in Western countries during the 1930s and 1940s, operates under a 'company + family farm' model. In recent years, China has advanced this system by establishing agricultural industrialisation consortia that integrate 'company + farmer cooperative + family farm' structures. These consortia coordinate production and sales through order-based agriculture, also known as contract farming. Under this model, family farms organise their production according to market orders, depending heavily on social networks to access market opportunities and secure necessary production materials. Social capital, comprising trust, norms, and networks, enabling family farms to obtain key resources such as markets, information, and funding (Beggs et al. 1996).

Putnam's (1995) theory of social capital highlights its critical role in global agriculture, particularly in the context of contract farming. Social capital contributes to agricultural sustainability by fostering stable networks, mutual trust, and clearly defined norms. Within this framework, it facilitates information exchange and resource coordination, thereby reducing transaction costs associated with market participation (Abbasi et al. 2021; Zheng and Zhang 2021). This, in turn, strengthens the otherwise weak bargaining position of farms in market transactions and enhances their resilience to market risks (Sezen and Yilmaz 2007). Social capital thus emerges as a key driver of success in order-based agriculture by enabling competitive advantages, facilitating resource acquisition and mobilisation, and

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building valuable network capital (Wuepper and Sauer 2016; Kustepeli et al. 2023).

Family farms, crucial for commercial production, are shaped by both formal and informal constraints. Social capital enhances their operational efficiency by fostering networks and trust (Kim et al. 2015). Research by Thomas et al. (2020) emphasises the significance of social networks in promoting sustainable agricultural practices and improving production efficiency. Social capital also facilitates the coordination of production factors, reduces transaction costs, and strengthens the competitive position of farms, particularly in navigating market risks (Zheng and Zhang 2021). While the role of social capital has been extensively studied in areas such as environmental governance, poverty alleviation, and rural development (He et al. 2015; Shi et al. 2018), its influence on family farms' participation in order-based agriculture remains underexplored.

This paper examines the role of social capital in influencing family farm participation in order-based agriculture in southwestern China, using data collected from 557 farms. The study applies a logit model and Karlson-Holm.Breen (KHB) mediation analysis to assess the indirect effect of information availability on participation. The findings reveal significant heterogeneity in how social capital impacts different types of family farms. This paper contributes by focusing on mountainous family farms, developing a measurable social capital indicator system, and revealing both direct and indirect effects, offering insights into their development.

MATERIAL AND METHODS

Theory and hypotheses

Bourdieu (1986) defined social capital as a set of resources and power derived from social relationships, with its value depending on the size and quality of one's network. Coleman (1988) emphasised that social capital is built through obligations, trust, information channels, and norms reinforced by sanctions. Putnam (1995) further developed this concept by stressing the importance of social networks, trust, and norms in fostering cooperation. In Chinese society, these elements – social networks, trust, norms, family relationships, and cooperation – exert a particularly strong influence on development, often more so than in Western contexts. These theoretical foundations inform the measurement of social capital through indicators such as network size and quality, social trust, and adherence to norms. Previous studies on farmers have assessed dimensions including network size, mutual assistance, trust, and social norms. For instance, Zheng and Zhang (2021) identified four dimensions: network size, mutual assistance, social trust, and network density. Shi and Yang (2023) streamlined these into three dimensions: network, trust, and norms. Chen and Li (2023) proposed five dimensions: network, trust, norms, participation, and reputation. Building on this body of work, the present study constructs a social capital indicator system for family farms based on three core dimensions: social networks, social trust, and social norms.

Impact of social capital on family farm participation in order-based agriculture. In the rural economy, family farm decision-making is shaped by trust and norms rooted in social networks both within and beyond the village. Social capital – encompassing networks, trust, and reciprocal norms – facilitates access to critical resources, supports market-oriented transactions, and promotes collective action, thereby encouraging participation in order-based agriculture (Zheng and Zhang 2021). Social networks, built on kinship, friendship, and geographic ties, enable the exchange of information, with broader networks enhancing the quality of decision-making. Social trust, whether interpersonal or institutional, fosters cooperation and reinforces engagement. Social norms, particularly those related to agricultural practices and product quality, influence behaviour and motivate participation in order-based agriculture. Based on these insights, the following hypotheses are proposed:

H_1: Social capital facilitates family farms in acquiring social resources, reducing production and operational risks, thereby positively promoting their participation in order-based agriculture.

H_{1a}: Social networks positively influence family farm participation in order-based agriculture.

H_{1b}: Social trust positively influences family farm participation in order-based agriculture.

H_{1c}: Social norms positively influence family farm participation in order-based agriculture.

Information availability of family farms plays a mediating role in the influence of social capital on their participation in order-based agriculture. Information accessibility refers to a family farm's ability to obtain and effectively use a variety of information channels. Social capital strengthens farm operations by promoting information exchange and building trust, as farms often maintain regular communication with relatives, neighbours, and business partners. High levels of community trust expand access to information sources, thereby encouraging participation in order-based agriculture. Research by Shi and Yang (2023) and

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Zheng and Zhang (2021) indicates that farmers with stronger social capital have greater access to information, which supports the adoption of new technologies. This improved accessibility reinforces social networks, elevates social standing, and enhances resilience, ultimately reducing risks related to production and market fluctuations. Based on this, the following hypothesis is proposed:

H_2: The information accessibility of family farms mediates the relationship between social capital and participation in order-based agriculture.

Intergenerational impact of social capital on family farm participation in order-based agriculture. Individuals from different generations are shaped by distinct social environments, resulting in differences in values, self-perception, resource access, and behavioural patterns. Younger family farm owners, with less social experience, may possess lower levels of social capital. In contrast, older owners – shaped by more traditional values – tend to have greater experience and a stronger sense of continuity. Consequently, the influence of social capital on participation in order-based agriculture may vary considerably across generations. According to Ren and Guo's (2023) classification, individuals under the age of 29 are categorised as the 'new generation', those aged 30 to 55 as the 'middle generation', and those over 55 as the 'older generation'. Based on this classification, the following hypothesis is proposed:

H_3: The impact of social capital on family farm participation in order-based agriculture differs significantly across generations.

Data and variables

Data selection and sources. Between 2021 and 2023, 572 questionnaires were collected during training sessions organised by the agricultural departments of Chongqing and Sichuan. These sessions targeted agricultural managers, family farm owners, and key individuals involved in wealth creation and skill development. Additionally, 136 questionnaires were gathered through field surveys conducted in Chongqing's Hechuan, Fengdu, Wanzhou, Fengjie, and Sichuan's Nanchong and Dazhou, bringing the total number of responses to 708. Both surveys employed the same questionnaire and format, and trained investigators conducted face-to-face interviews to ensure the accuracy of the information collected. After excluding incomplete or inconsistent responses, 673 valid questionnaires remained, of which 557 were selected for statistical analysis, focusing specifically on family farms.

Variable definition. The dependent variable in this study is whether a family farm participates in order-based agriculture. Participation is coded as 1, while non-participation is coded as 0.

The independent variables are divided into three categories: social capital, information availability, and family characteristics.

i) Social capital

Social networks are measured by network size and density, using scales adapted from Zhu et al. (2023). Social trust is assessed following He et al. (2015), while social norms are based on Kuo et al. (2021). All variables are rated on a 5-point Likert scale and standardised $Z = (x - \min) / (\max - \min)$ using Z-scores. The cross-sectional entropy weight method (the entropy method is a technique for objectively assigning weights to indicators based on the magnitude of their information entropy; a smaller information entropy value indicates a greater degree of dispersion for the indicator, implying more information content and a higher assigned weight) is employed to assign weights. Indicators with lower entropy values, which indicate greater variability and more information, receive higher weights. Finally, sub-index scores are calculated, leading to the computation of an overall composite social capital index (Table 1).

ii) Information accessibility

For this study, information accessibility serves as a mediating variable to explain how social capital influences family farms' participation in order-based agriculture. Drawing on the research framework of Zheng and Zhang (2021) and others, information accessibility is measured by the number of channels through which family farms obtain information related to order-based agriculture. The questionnaire included the question: 'Through which channels do family members usually obtain information about order-based agriculture?' Respondents could select from six options: family and friends, enterprise channels, cooperatives, grassroots government, online sources, and print media (Table 2).

iii) Family characteristics

This study includes family characteristics as control variables to examine factors influencing family farm participation in order-based agriculture. Previous research by Hou et al. (2018) and Gao and Yan (2023) emphasises the importance of individual, family, and operational characteristics in shaping farm behaviour. Individual characteristics considered here include the farm owner's age, educational level, and years of farming experience. Family characteristics include the available labour force

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Table 1. Definition and description of social capital

Variable name	Variable indicator	Indicator description
Social network	number of frequently contacted relatives, neighbours, or business contacts	rarely = 1; few = 2; moderate = 3; many = 4; very many = 5
	frequency of interaction with relatives, neighbours, or business contacts	very weak = 1; relatively weak = 2; moderate = 3; relatively strong = 4; very strong = 5
Social trust	degree of trust in relatives, neighbours, or business contacts	distrust = 1; somewhat distrust = 2; moderate = 3; somewhat trust = 4; trust = 5
	degree of trust in grassroots cadres	distrust = 1; somewhat distrust = 2; moderate = 3; somewhat trust = 4; trust = 5
Social norms	farm's attention to quality and safety	not concerned =1; not too concerned = 2; moderate = 3; quite concerned = 4; very concerned = 5
	farm's emphasis on production technology	not emphasised = 1; not too emphasised = 2; moderate = 3; quite emphasised = 4; very emphasised = 5

Source: Compiled by the authors

Table 2. Variable description and descriptive statistics

Variable type		Variable name	Variable description	Mean	SD
Dependent variable		participation in order-based agriculture	participate = 1, otherwise = 0	0.42	0.494
Independent variables	social capital	social capital	composite index calculation	0.64	0.166
		social network (20.7%)	social network index calculation	0.79	0.182
		social trust (53.9%)	social trust index calculation	0.56	0.250
		social norms (25.4%)	social norms index calculation	0.68	0.217
	available information	information accessibility	number of information channels/person	4.41	0.951
	family characteristics	farmer's age	below 17 = 1; 18–29 = 2; 30–45 = 3; 46–55 = 4; 56 and above = 5	3.4	0.725
		farmer's education	elementary or below = 1; junior high = 2; senior high or vocational = 3; college or professional = 4; bachelor's degree or above = 5	3.02	1.170
		farming experience	below 2 years = 1; 3–5 years = 2; 5–8 years = 3; 9–12 years = 4; 12 years and above = 5	2.21	1.166
		family labour available	number of family members available for farm work: people	1.93	0.941
		agricultural talent title	family has agricultural talent title = 1, otherwise = 0	1.93	0.941
		family farm type	planting type = 1; breeding type = 2; planting and breeding combination type = 3	0.53	0.499
		proximity to urban area	urban outskirts (within 10 km) = 1, otherwise = 0	0.83	0.380

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and possession of agricultural professional titles. Operational characteristics encompass farm type and location, with proximity to urban areas measured by whether the farm is situated in the suburban area of a town.

iv) Variable descriptions and sample characteristics

The survey shows that 91.1% of respondents are aged between 30 and 59, with 39.9% falling within the 46–59 age range, indicating an aging challenge among family farm operators. The average education level is 3.02, consistent with the '2021 National Report on the Development of High-Quality Farmers', which reports that 50.98% of farmers have a high school education or higher. Most operators have 5 to 8 years of farming experience, indicating substantial expertise. Analysis of social capital reveals that social trust plays the most significant role, contributing 53.9%, followed by social norms at 25.4% and social networks at 20.7%.

Methodology

The research methods are selected based on the characteristics of the data and practical considerations. The logit regression model is well suited for handling discrete, binary outcome variables while controlling for internal collinearity. Additionally, the KHB mediation test is employed to address the comparability of regression coefficients in nonlinear models, enabling decomposition of effects within such models.

Logit regression model setting. The dependent variable is whether family farms participate in order-based agriculture. To examine the impact of social capital on this participation, a logit regression model is used due to the binary nature of the outcome. The logit model is specified as follows:

$$p_i = F(y) = \frac{1}{1-e^{-y}} \tag{1}$$

where: p_i – the probability that a family farm participates in order-based agriculture; y – the participation status, if a family farm participates then $y = 1$, otherwise it is 0; i – individual family farms; e – natural constant

The variable y is modelled as a linear combination of social capital (SCA), mediaton variable (MED), and control variables (CON), expressed as follows:

$$y_i = a_0 + \beta_F X_i + \delta_F M_i + \sum \lambda_F C_i + \varepsilon_i \tag{2}$$

where: a_0 – the constant term; X_i – the explanatory variables, which mainly refers to the social capital composite index of family farm i and the specific index of social network, social trust, family prestige and social norms; β_F – the pending estimated parameter of social capital, which measures the influence of social capital on the agricultural participation behaviour of family farm order; M_i – the family farm i with 'information availability' as the mediation variable value δ_F and the estimated variable of the variable; C_i – personal characteristics, family characteristics and social environment; λ_F – the estimated parameter of the control variable; ε_i – random interference term.

Processing Equations (1 and 2), a logit binary estimation model is constructed as follows:

$$\text{Logit}(p) = \ln\left(\frac{p_i}{1-p_i}\right) = a_0 + \beta_F X_i + \delta_F M_i + \sum \lambda_F C_i + \varepsilon_i \tag{3}$$

Mediation effect assessment and KHB method testing. Following Wen and Ye's (2014) approach, we first assess the presence of mediating effects. When mediation is detected, the KHB method is applied to estimate the mediating effect in binary choice models. A stepwise regression coefficient test is used for this assessment. Because the dependent variable is categorical and the independent variables are continuous, a logit model is employed. The constructed model is as follows:

$$Y' = cX + e_1 \tag{4}$$

$$M = aX + e_2 \tag{5}$$

$$Y'' = c'X + bM + e_3 \tag{6}$$

$$Y' = Logit(p)(y = 1|X) = \ln\frac{p(y=1|X)}{p(y=0|X)} \tag{7}$$

$$Y'' = Logit(p)(y = 1|M, X) = \ln\frac{p(y=1|M,X)}{p(y=0|X)} \tag{8}$$

where: M – the availability of intermediary variable; X – social capital; Y' – the participation of family farm agriculture; Y'' – the participation of family farm agriculture after adding the availability of information; a – the effect of X on M; b – the effect of M on Y''; c – the effect of X on Y'; c' – the effect of x on Y'' after adding the availability of variable information; e_1, e_2 and e_3 – random parameters.

The coefficient c in Equation (4) is tested under the null hypothesis (H_0: $c = 0$), followed by tests of coefficients a (H_0: $a = 0$) and b (H_0: $b = 0$). A significant c indicates a mediating effect; otherwise, a suppression (concealment) effect may be considered (Wen and Ye

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2014). To quantify the total, direct, and indirect effects, the KHB method developed by Kohler et al. (2011) is applied.

Deriving Equation (9) from Equation (3) by omitting the intermediary variable *M*:

$$Y^{*} = a_0 + \beta_R X_i + \sum \lambda_R C_i + \varepsilon_i \quad (9)$$

Finally, the direct effects, denoted as $b_F = \beta_F / \sigma_F$ and the total effects $b_R = \beta_R / \sigma_R$, can be obtained from Equations (3 and 4). Thus, the indirect effects are:

$$b_R - b_R = \beta_R / \sigma_R - \beta_F / \sigma_F \quad (10)$$

RESULTS AND DISCUSSION

Reliability and validity tests

Reliability and exploratory factor analyses were conducted on the scales for each variable. The results showed that the Cronbach's alpha values for all latent variables exceeded 0.7, and the composite reliability (CR) values were also above 0.7, meeting the established thresholds. These findings indicate that the survey data demonstrate good reliability and internal consistency, making them suitable for further empirical analysis.

Influence of social capital and its related dimensions

Using Stata 15, this study estimated a binary logit model to analyse the impact of social capital on family farm participation in order-based agriculture. A variance inflation factor (VIF) test confirmed the absence of multicollinearity, with the maximum VIF below 5. Model fit was validated by a Prob > chi² value of 0.000. The results indicate that social capital has a significant positive effect on participation at the 1% significance level. Higher social capital enhances access to information, social resources, and risk awareness, thereby supporting greater involvement. Specifically, social networks reduce information search costs, increasing contract opportunities; social trust facilitates cooperation; and social norms raise awareness of product quality standards. These findings confirm $H_{1,\ 1a-c}$. Overall, social capital (through networks, trust, and norms) improves resource access and promotes family farm participation in order-based agriculture.

Impact of control variables on family farm participation in order-based agriculture

Individual characteristics such as age, education, and farming experience significantly influence participation in order-based agriculture. Older owners, attached to traditional farming, are less likely to engage, while those with higher education are more inclined to participate, recognising the importance of product safety. Experienced farmers, aware of risks, are more likely to join due to better access to technology and stable income. Family characteristics like labour availability negatively affect participation, as farms with more labour tend to diversify and rely less on cooperatives. Agricultural expertise titles provide social prestige and improved resource access, increasing engagement. Operational characteristics, including farm type and proximity to suburban areas, also significantly affect participation, with suburban farms more likely to engage.

Mediation effect test of information accessibility on family farm participation in order-based agriculture

To assess the mediating effect of information accessibility, we followed the methodologies of Chen and Li (2023) and Shi and Yang (2023). The results, shown in Table 3 and 4, confirm that social capital and its dimensions have a significant positive impact on family farm participation in order-based agriculture. Additionally, Table 5 demonstrates that social capital and its components significantly enhance information accessibility at the 1% significance level. This indicates that greater social capital broadens information channels for family farms, supporting H_2.

Mediation effect test based on the KHB model

The KHB model results show that the coefficients for total, direct, and indirect effects are all positive and statistically significant at the 1% level ($P < 0.01$), confirming the mediating role of information accessibility in the relationship between social capital and family farm participation in order-based agriculture. Specifically, social capital has a direct effect on participation (84.45%) and an indirect effect through information accessibility (18.42%) (Table 6). These findings indicate that higher levels of social capital expand information channels, thereby increasing the likelihood of family farm involvement in order-based agriculture.

Robustness testing

To verify the reliability of the regression results, robustness tests were performed by modifying the calculation method of social capital variables and applying alternative models, as shown in Table 7. Mod-

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Table 3. Estimation results of family farm participation in order-based agriculture using the logit model

Variable	Model 1	Model 2	Model 3	Model 4	Model 5
Social capital	4.892*** (0.812)	–	–	–	–
Social network	–	2.33*** (0.525)	–	–	1.763*** (0.663)
Social trust	–	–	1.444*** (0.472)	–	1.366*** (0.509)
Social norms	–	–	–	3.479*** (0.507)	3.377** (0.518)
Information accessibility	0.480*** (0.132)	0.421*** (0.137)	0.597*** (0.127)	0.608*** (0.132)	0.425*** (0.146)
Farmer's age	–0.245* (0.141)	–0.246* (0.136)	–0.226* (0.135)	–0.374*** (0.144)	–0.348** (0.147)
Farmer's education	0.169* (0.099)	0.414*** (0.089)	0.291*** (0.086)	0.430*** (0.093)	0.292*** (0.104)
Farming experience	0.243** (0.091)	0.268*** (0.089)	0.257*** (0.087)	0.193*** (0.092)	0.202** (0.093)
Family labour available	–0.236** (0.092)	–0.174** (0.088)	–0.194** (0.088)	–0.187** (0.093)	–0.234** (0.095)
Agricultural talent title	0.491** (0.248)	0.497** (0.240)	0.517** (0.241)	0.534** (0.248)	0.477* (0.254)
Family farm type	0.364*** (0.105)	0.382*** (0.103)	0.340*** (0.102)	0.366*** (0.107)	0.387*** (0.109)
Proximity to urban area	0.611*** (0.202)	0.641*** (0.198)	0.598*** (0.196)	0.539*** (0.205)	0.585*** (0.208)
Observations	577	577	577	577	577
Pseudo R^2	0.193	0.156	0.149	0.208	0.229

*, **, and ***significance levels of 0.1, 0.05, and 0.01, respectively; SEs are reported in parentheses
Source: Compiled by the authors

Table 4. Regression analysis of the individual impact of social capital and its dimensions on family farm participation in order-based agriculture

Variable	Model 6	Model 7	Model 8	Model 9
Social capital	5.408*** (0.789)	–	–	–
Social network	–	3.157*** (0.572)	–	–
Social trust	–	–	1.651*** (0.453)	–
Social norms	–	–	–	3.557*** (0.5497)
Control variables	controlled	controlled	controlled	controlled
Pseudo R^2	0.174	0.143	0.117	0.176

***significance level at 0.01; SEs are reported in parentheses
Source: Compiled by the authors

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Table 5. Regression analysis of social capital and its dimensions on information accessibility separately

Variable	Model 10	Model 11	Model 12	Model 13
Social capital	1.876*** (0.259)	–	–	–
Social network	–	2.458*** (0.189)	–	–
Social trust	–	–	0.678*** (0.180)	–
Social norms	–	–	–	0.479*** (0.181)
Control variables	controlled	controlled	controlled	controlled
F	14.230	30.190	8.950	7.960
Prob > *F*	0.000	0.000	0.000	0.000
Adj. R^2	0.160	0.296	0.103	0.091

***significance level at 0.01; SEs are reported in parentheses
Source: Compiled by the authors

Table 6. Mediation effect test based on the KHB model

Social capital – Information accessibility – Order-based agriculture	Coefficient	*P*-value	Percentage (%)
Total effect	5.793	0.000	–
Direct effect	4.892	0.000	84.45
Indirect effect	0.901	0.002	18.42
Pseudo R^2	0.190	–	–

Source: Compiled by the authors

Table 7. Robustness test

Variable	Logit regression		Probit regression	
	Model 14	Model 15	Model 16	Model 17
Social capital	4.110*** (0.672)	–	2.861*** (0.461)	–
Social network	–	1.090* (0.593)	–	0.985** (0.388)
Social trust	–	1.107** (0.501)	–	0.760*** (0.295)
Social norms	–	2.713*** (0.624)	–	1.191*** (0.290)
Mediating variable	controlled	controlled	controlled	controlled
Control variables	controlled	controlled	controlled	controlled
Observations	577	577	577	577
Pseudo R^2	0.211	0.218	0.191	0.225

*, ** and ***significance levels at 0.1, 0.05 and 0.01, respectively; SEs are reported in parentheses
Source: Compiled by the authors

els (14) and (15) adjusted the measurement of social capital by replacing the variables 'frequency of interaction with relatives, neighbours, or business contacts' and 'level of trust in grassroots cadres' with alternative indicators. Models (16) and (17) employed Probit regression. In all cases, the Prob > chi² values were 0.000, indicating strong statistical significance. Although the coefficients varied slightly, the core variables remained significant, confirming the robustness of the empirical findings.

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Table 8. The impact of social capital on order farming participation behaviour in different generational family farms

Variable	New generation	Middle generation	Older generation
Social capital	2.376 (2.810)	4.801***(1.154)	6.252 (4.511)
Mediating variable	controlled	controlled	controlled
Control variables	controlled	controlled	controlled
Sample	44	478	35
Pseudo R^2	0.187	0.182	0.305

***significance level at 0.01; SEs are reported in parentheses
Source: Compiled by the authors

Analysis of intergenerational differences in family farms

As presented in Table 8, the influence of social capital on participation in order-based agriculture differs across generations, supporting H_3. The effect is most pronounced among the middle generation, who are more actively involved in farm operations and more dependent on income from family farming. This group tends to possess higher levels of awareness, stronger social capital, and better access to resources, making them more likely to engage in order-based agriculture than their younger or older counterparts.

CONCLUSION

This study draws on survey data from 557 family farms in the mountainous Southwest region to examine how social capital influences participation in order-based agriculture. By combining binary logit regression with the KHB mediation method, the analysis explores both the direct and indirect effects of social capital – mediated by information accessibility – while also accounting for demographic heterogeneity. The key findings are as follows:

Social capital, along with education, farming experience, and suburban location, positively influences participation, whereas age and available labour have negative effects.

Information accessibility serves as a mediating variable, amplifying the effect of social capital by improving access to relevant information.

The influence of social capital is more pronounced among young and middle-aged family farms, underscoring the importance of generational differences.

These findings highlight the critical role of social networks, trust, and information-sharing in promoting family farm participation in order-based agriculture. Policy support, especially through digital platforms and targeted interventions for young and middle-aged farmers, is essential for driving sustainable development. Tailored training programs for rural talent will further support their integration into modern agricultural value chains.

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