

ENTREPRENEURIAL OPPORTUNITY, VALUE EVOLUTION, AND ORGANIZATIONAL INTEGRATION OF PROFESSIONAL FARMER ENTREPRENEURSHIP: A MULTI-CASE COMPARISON IN CHINA

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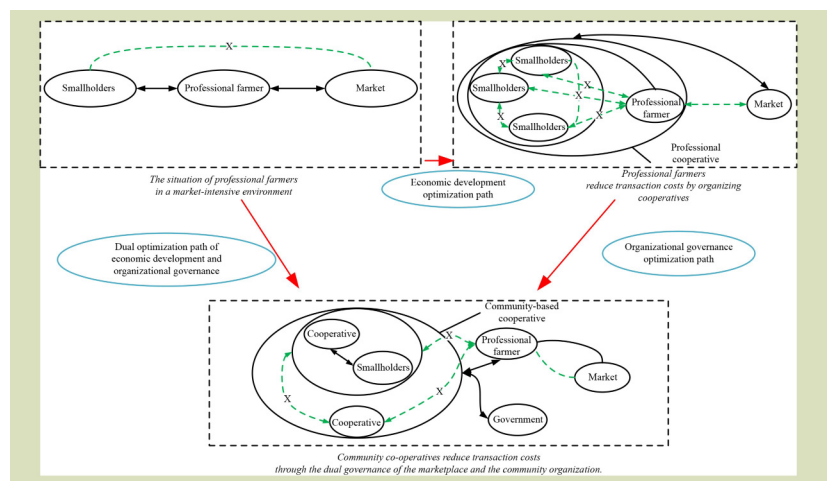
KEYWORDS

Benefit-linked mechanism, featured agriculture, organizational integration, professional farmers, rural cooperative, structural hole theory

HIGHLIGHTS

- The choice of a modern agriculture project was found to be rational for professional farmers to reduce interference from non-market factors. The success of this project is due to its capacity to successfully fill the structural hole in the market transaction network.
- Professional farmers were shown to start their businesses by occupying the ‘self-benefit’ or ‘mutual-benefit’ structural hole of the market transaction network in economically developed areas.
- Professional farmers were found to occupy the organizational-governance structural hole of the rural social relationship network and the ‘mutual-benefit’ structural hole of the market network to start their businesses in traditional agricultural areas.

GRAPHICAL ABSTRACT



ABSTRACT

A comparative multi-case analysis of professional farmer entrepreneurship cases in China was performed by applying the structural hole theory. The results confirmed four views. (1) Choosing the modern agriculture project in entrepreneurship is rational for professional farmers, who return from urban, to reduce the interference from non-market factors. The success of this project stems from its ability to successfully occupy the structural hole of the market trading network. (2) In economically developed areas, professional farmers start their businesses and reduce transaction costs with factors by occupying ‘self-benefit’ or ‘mutual-benefit’ structural holes in market networks. (3) In traditional agricultural areas, for reducing factor transaction costs, professional farmers occupy the organizational-governance structural hole of rural social relationship networks and the mutual-benefit structural hole of market networks to start their businesses. (4) The embedding order of these two structural holes will change depending on the differences in the local resource endowment. This article proposes some suggestions to encourage professional farmers to develop featured agricultural projects, build a close benefit-linked

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mechanism with smallholders through the provision of socialized services, and participate in the governance of rural communities.

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1 INTRODUCTION

Many farmers leave the countryside in some middle-income countries like Brazil, China, India, and Indonesia because of urbanization and industrialization^[1]. Similarly, many farmers return the rural areas to pursue agricultural projects and seek success in entrepreneurship^[2,3]. Cash crop cultivation and related industries are highly marketable, and professional farmers, who return from urban, can leverage their rich entrepreneurial talents and resource endowments to take advantage of the agricultural supply chain^[4,5]. Professional farmers are modern agricultural practitioners who take agriculture as their occupation, have complementary professional skills, earn income mainly from agricultural production and operation and reach a considerable level^[6]. However, in traditional agricultural areas, the success of modern agriculture depends not only on the producer business capacity but also on the producer social capital, the organizational structure in production, and the influence of clan power in the rural community^[7]. Modern agriculture, also known as new agriculture, is a form of agriculture with high input and high output compared to traditional agriculture, widely used in contemporary science and technology, production materials provided by modern industry, and scientific management methods^[8].

With the implementation of China's rural revitalization strategy, many entrepreneurs/rural laborers who have migrated to urban areas are returning to rural areas to undertake agricultural farming/farming projects to achieve entrepreneurial success through agricultural operations. The aging of the rural workforce and the loss of younger generation from rural communities provides conditions for developing professional farmers who return to their hometowns to start their businesses^[9]. There are few cases of professional farmers who have achieved personal success and led to the development of rural communities. More professional farmers have not been successful with their farming operations^[10–12]. In China, the concept of professional farmers is equivalent to commercial farmers and refers to agricultural producers who are different from ordinary self-employed smallholder farmers. They produce and manage agricultural projects through a commercial model. Their failure stems more from their production methods and market adaptability, not meeting the

actual needs. The analysis of professional farmers in this thesis does not involve the concept of technical competence or degrees in agriculture^[6].

Rural marketization is high in the coastal areas of south-east China. Professional farmers usually engage in large-scale cultivation of high economic value-added cash crops and rely on establishing family farms to realize family-based large-scale operations. Nevertheless, in traditional agricultural areas of China, the family farm form is often replaced by farmer cooperatives, and the development of professional farmers must take into account not only market factors but also the collective interests of the community^[13,14].

Professional farmers live in social networks composed of ordinary farmers in the local rural community. Rural social relations networks are affected by the distribution of inputs and the marketing of commodities by professional farmers. With a central position in rural social networks, professional farmers can gain valuable information on the production, marketing, and services that contribute to the success of professional farmers. The economic behavior of professional farmers is integrated into social networks, and interpersonal relations affect economic behavior. The success of a professional farmer depends not only on his entrepreneurship but also his social capital. The location of an individual's social structure affects his or her access to resources and information, as well as the social constraints to which he or she is subject, which can affect his or her economic behavior^[15].

Granovetter proposed that social network theory can build a bridge between micro-behavior and macro-behavior^[16]. Social network research, represented by Granovetter's weak cascade advantage theory^[17,18], Burt's structural hole theory^[19], and Lin's social capital theory^[20], has been conducted to analyze the mechanisms underlying the success of job search, job promotion, and job transfer in the labor market. Social network analysis tools have not yet been applied to the theoretical analysis of professional farmer success in agricultural entrepreneurship. Therefore, it would be of great theoretical value to use social network analysis tools to answer professional farmer development path choices and to explore why they seek to balance their development and social development to achieve benefits.

Professional farmers will face some practical problems, such as their low entrepreneurship success rate^[21], interference from non-market factors, and incompatibility between entrepreneurial projects and local rural community development in the process of agriculture-related entrepreneurship^[22]. So, the first aim of this work is to analyze the critical factors for the success of professional farmer entrepreneurship through the structure hole theory. The second objective is to find theoretical evidence for Chinese professional farmers to achieve the dual advantages of social and market networks. Finally, the third objective is to recognize China's development experience for professional farmers in other developing countries.

Therefore, this article attempts to answer the following research questions: What are the factors contributing to the success or failure of professional farmers in farming-related entrepreneurship? What are the economic implications of the preference of Chinese professional farmers to lead professional cooperatives and serve as managers of rural communities in the traditional rural areas of China's mainland? Answering these questions can encourage professional farmers to participate in the rural revitalization strategy and integrate their entrepreneurship with the production of smallholders.

This study is therefore structured as follows: Section 2 reviews the literature on professional farmer entrepreneurship and structural hole theory. Section 3 proposes three hypotheses according to the literature review results. Based on structural hole theory, this article presents a mechanistic analysis of the different conditions and the formation of various types of professional farmer entrepreneurship. Section 4 presents a comparative review of four cases. Section 5 adopts structural hole theory to formulate several propositions and prove the hypotheses proposed in Section 3. Section 6 summarizes this article's theoretical and practical contributions and acknowledges its limitations.

2 LITERATURE REVIEW

2.1 Transformation of professional farmer entrepreneurship

Previous theoretical studies on the entrepreneurial development of professional farmers have focused on three dimensions. First, these studies have examined the improvement in these farmer ability to identify entrepreneurial opportunities^[23]. However, these studies have never responded positively to the theoretical foundation causes behind the failed

entrepreneurship of these farmers and their difficulty in selling agricultural products despite their rich market experience, early wealth accumulation, and social communication skills^[24]. The key to the success of professional farmers lies in their ability to identify opportunities and participate in the market^[11].

Comparative theoretical studies have also examined the value transformation path of professional farmers during their participation in agricultural industrialization^[25]. Researchers believe that the linkage between agricultural schools, enterprises, professional farmers in vocational education, and governments will help improve the entrepreneurship success rate^[26,27]. Also, in the absence of policy intervention, these farmers willingly engage in the high value-added fruit and vegetable cultivation industry, aquaculture industry, and agriculture-related secondary and tertiary industries^[28,29]. However, previous studies have ignored the internal reasons behind the preferences of professional farmers to associate themselves with the cash crop cultivation (breeding) industry or the agriculture-related secondary and tertiary industries^[30–32].

Previous studies have also examined the organizational integration of professional farmer business performance and proposed that the differences in organizational characteristics determine resource integration and allocation heterogeneity for professional farmers, affecting their entrepreneurship performance^[23,33]. However, they merely analyze organizational elements as isolated indicators without considering the corresponding environment, individual endowments, and organizational factors^[34].

2.2 Relationship between structural hole theory and farmer entrepreneurship

Social networks comprise relationships formed via group interactions and economic behavior^[35]. Ruef indicated that having strong social network connections can help entrepreneurs absorb non-redundant information and social (heterogeneous) resources, accurately identify entrepreneurial opportunities, transform opportunity identification into value realization, and optimize their innovation activities^[36]. This study is the first to adopt structural hole theory to illustrate how social network operational actors can transform opportunities into value by highlighting their degree of interests relevant to other stakeholders^[36]. Also, the critical individual who fills a structural hole using his or her information and control advantage can also identify adequate information, realize the intermediary role of an information

bridge, and promote an adequate flow and transformation of information and resources^[19].

According to the results of Burt's research, economic activities operate by forming a social market outside of product transactions, in which members develop interrelationships and exchange or risk information related to the organization. Therefore, any economic activity can never be implemented as a simple exchange of knowledge goods but should also consider the environmental factors in which it occurs. The mode of economic exchange must be embedded in a particular social structure^[19]. Social embedding theory assumes that the individual-centered social network (egocentric network) is partly autonomous and dependent. The economic behavior of actors is both autonomous and, at the same time, embedded in interactive networks and will be conditioned by social networks^[17].

Burt uses structural holes to represent non-redundant connections, claiming that “structural holes link non-redundant contacts, and a structural hole is a non-redundant connection between two actors”^[19]. Structural hole theory integrates related ideas into various types of literature (e.g., the strength of weak relationships, local bridge ideas and network exchange theory) into a coherent theoretical framework. It demonstrates intermediaries' information and control advantages in such structures and thus has a wide range of applications^[37,38]. In analyzing why professional farmers choose to engage in entrepreneurial projects based on structural hole theory^[39], comparative studies found that most farmers work in agriculture-related secondary and tertiary industries^[40,41]. However, a theoretical elaboration of action strategies is also lacking, especially without a positive answer to whether there is a market transaction network environment or social relations in a structural hole determined by the governance environment. Therefore, the structural hole framework is adopted to examine opportunity identification and value transformation in developing agriculture-related industries for professional farmers.

Finally, previous studies have not effectively explained why professional farmers in traditional agricultural projects are more willing to become leaders in rural communities. Also, relevant studies have not provided theoretical explanations for why rural community leaders can form an integrated development of rural collective economy, rural cooperative development, and community management^[41].

Through a review of previous literature, this article will explain why professional farmers are more willing to participate in

rural community governance and attempt to become actual community leaders through network structure hole theory. The study will also examine the motivation and evolutionary process of the dual embedding of social relationship networks and economic networks achieved by professional farmers in rural entrepreneurship.

3 VIEWPOINTS AND MECHANISMS

3.1 Structural hole in market transaction networks

As a typical capital- and labor-intensive agricultural project, the success of modern agriculture mainly depends on strengthening agri-food marketing, brand cultivation, Agri-food quality. Also, modern agriculture focuses on targeted production plans and marketing models based on information on market demand. When professional farmers have easier access to the production factors needed for appropriately scaled operations, they are more concerned with the market adaptability of the agricultural products than with land transfer and labor hiring with ordinary smallholder farmers. In addition, professional farmers are more concerned with reducing transaction costs with their trading partners than ordinary small farmers. The involvement of professional farmers in agricultural market transactions and their dominance in the agricultural supply chain has become the key to the success of professional farmer entrepreneurship.

Viewpoint 1: Professional farmers engage in the modern agriculture project to guarantee entrepreneurship success but fail to do so because of their inability to occupy the market transaction network structural hole.

3.2 Choice of market transaction network structural hole

Production factor markets in economically developed regions are well developed, and when professional farmers engage in cash crop production and marketing, they can obtain the resource endowment factors required for production through market transactions. When controlling factor transaction costs, farmers reduce transaction costs by operating in agricultural markets and occupying the ‘self-benefit’ structural hole in the market transaction network. Suppose professional farmers cannot effectively occupy the ‘self-benefit’ structural hole, they can transfer some benefits by leading or joining rural cooperatives to occupy the market transaction network ‘mutual-benefit’ structural hole while considering the interests of other stakeholders.

Viewpoint 2: In economically developed areas, professional farmers can occupy the 'self-benefit' or 'mutual-benefit' structural hole in the market transaction network by embedding the characterized agricultural product chain. Then professional farmers can realize the transformation of resource advantages into opportunity recognition and value transformation advantages.

3.3 Double embedding of different structural holes

In traditional agricultural areas, to reduce the production factor transaction costs arising from the allocation of resources among local governments, rural communities, and smallholders, professional farmers will occupy the common-beneficial market transaction network structural hole and the organizational-governance network structural hole to leap from opportunity recognition to value creation.

Viewpoint 3: In traditional agricultural areas, professional farmers need to occupy both the 'mutual-benefit' structural hole of the market transaction network and the organizational governance structural hole of the social relationship governance network. The timing of embedding these two networks vary with industrial characteristics and regional allocation differences.

3.4 Mechanism analysis

3.4.1 Comparison of market and organizational embedding conditions

The participation of professional farmers in the modern agriculture project requires embedding the upstream and downstream sub-networks (e.g., factors and product transaction networks) in the agricultural product supply chain. Figure 1 illustrates the combination of factors that maximize the output of professional farmers under specified cost conditions. When the commodity market transaction costs and factor market transaction costs are given, there exists a unique iso-cost line FG and an isoquant line Q_1 . The combination of factors achieves the maximum output at a given cost condition at the cut point A. When the commodity market transaction costs and factor market transaction costs are given, there exists a unique iso-cost line EG and an isoquant line Q_2 . The combination of factors achieves the maximum output at a given cost condition at the cut point E.

When the unit transaction cost in the commodity market is constant, reducing the factor transaction cost with small-scale farmers will motivate professional farmers to expand their production capacity and vice versa. Even under a given

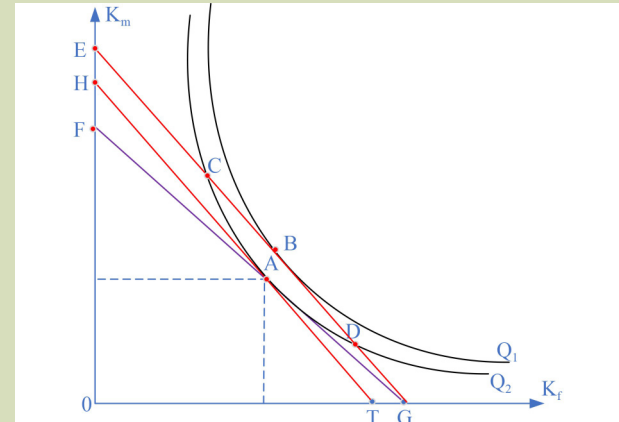


Fig. 1 Maximize the output of professional farmers under specified cost conditions.

endowment factor constraint, changing MRT makes the iso-cost line change to HT, and the old isoquant line intersects with the new iso-cost line (the original scale of production becomes uneconomic). Under the established conditions of factor transaction costs, professional farmers improve their ability to participate in the commodity market and take advantage of production technologies to reduce transaction costs and improve production capacity.

X indicates the presence of obstacles in the product chain. The dotted line indicates the connection mode before the structural hole is embedded. The solid line indicates the connection mode of stakeholders after the structural hole is embedded.

Figure 2(a) shows the professional farmers embedded in the 'self-benefit' structural hole. When professional farmers participate in agricultural projects, they choose the modern agriculture project for two reasons. Firstly, the entrepreneurs can support these farmers in effectively occupying the market transaction network structural hole and gaining economic benefits. Secondly, modern agriculture projects focus more on market operation capability, and professional farmers have more information acquisition advantage, information screening advantage, and information transformation advantage than ordinary small-scale farmers in market operation. Thirdly, in a highly market-oriented business environment, professional farmers can use their entrepreneurial skills and overcome their lack of social capital when choosing modern agriculture projects and paying more attention to the operation of agricultural markets. Finally, entrepreneurs can only be profitable in grain crop growing in rural China if they have sufficient land scale and high financial subsidies from governments. Since 2018, with rising land

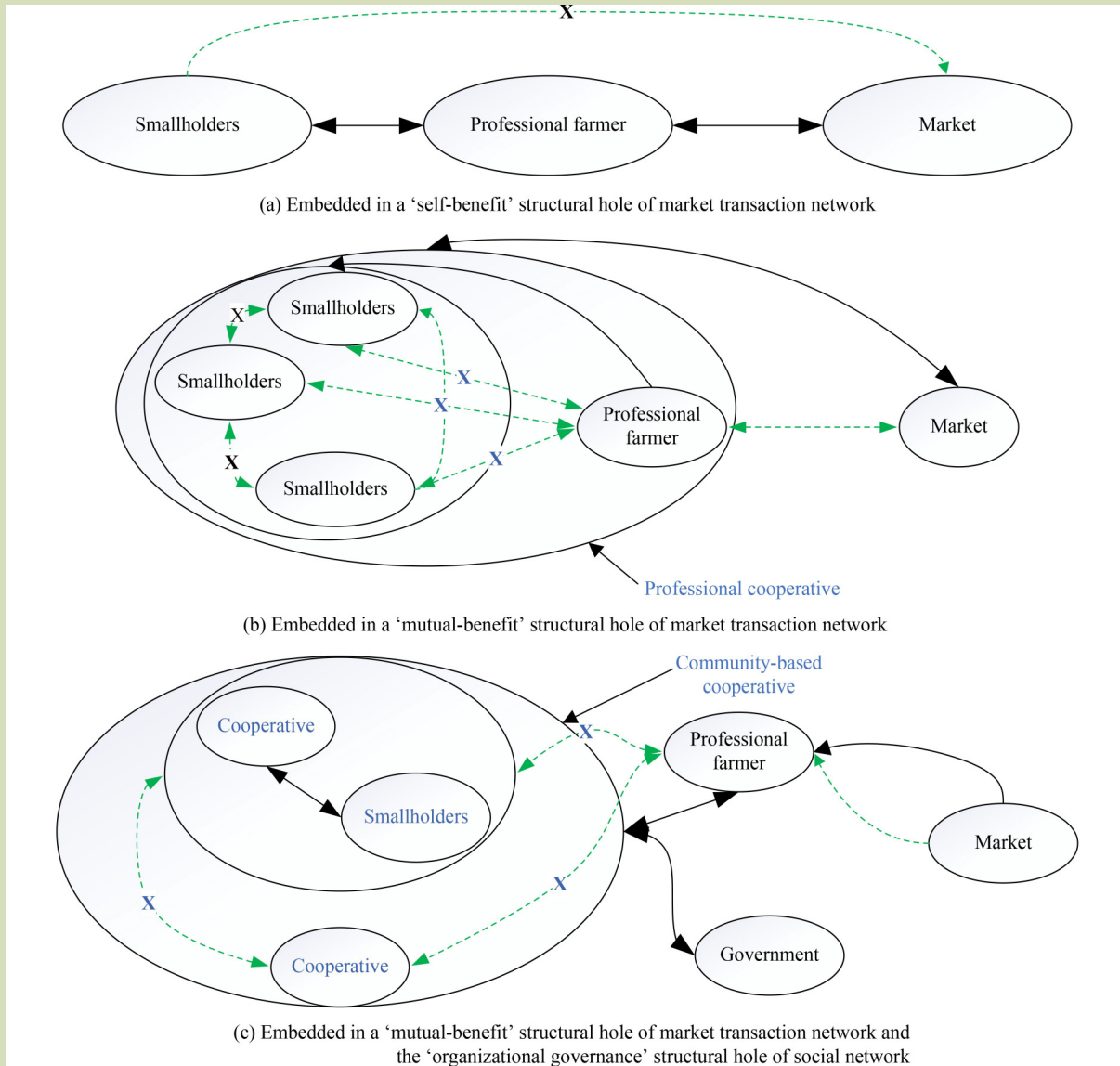


Fig. 2 Embedded dynamic evolution map of structural holes.

transfer costs and declining government direct grain subsidy, profit for grain crop production has decreased. Therefore, professional farmers focus more on modern agricultural projects than grain crop cultivation.

3.4.2 Formation of dual structure environmental governance

To reduce the transaction cost in the factor market, professional farmers can cooperate with small-scale farmers or other agricultural operators in sharing and distributing the benefits of factors of production (e.g., labor and land resources). Meanwhile, professional farmers build strong relationship governance (i.e., organizational integration)

through institutional design in order for entrepreneurs to reap the advantages of information resources diversification, which allow them to occupy the market transaction network structural hole.

Professional farmers in economically developed areas move from a 'self-benefit' structural hole occupant to a 'mutual-benefit' structural hole occupant guided by economic interests. Professional farmers choose to form an integrated development with other business entities and build strong relationship governance based on leading or joining farmer professional cooperatives. Professional farmers give some economic benefits to lower transaction costs to small-scale farmers, rural

communities, and other business entities regarding land rent and labor hire. In addition, they dominate resource information flow through socialized services to occupy the market trading network and benefit other stakeholders.

Figure 1 shows that professional farmers occupy the structural hole in the ‘mutual-benefit’ market transaction networks and receive support from other stakeholders to reduce the product factor transaction costs. Consequently, the ISO-Cost FG line becomes EG, professional farmers increase their production capacity further, and the ISO yield line changes from Q_2 to Q_1 .

Also, Fig. 2(b) shows that professional farmers occupy the ‘mutual-benefit’ structural hole in the market network by leading or participating in professional cooperatives to achieve a dual-win situation among ordinary small-scale farmers, cooperatives and professional farmers.

When professional farmers seek to further reduce factor transaction costs after occupying the ‘mutual-benefit’ structural hole of market transactions, they will consider occupying the structural hole of the organizational-governance social network at the same time.

Similarly, when professional farmers first occupy the structural hole of the organizational-governance social network, they will consider occupying the ‘mutual-benefit’ structural hole of market transaction networks. This action will further motivate professional farmers to forego part of their economic benefits to gain the support of other participants.

Figure 2(c) shows that professional farmers become the leaders of rural communities. With the help of authoritative governance, they effectively occupy the structural hole of the rural community network organization. On one side, these farmers occupy the market trading network “mutual-benefit” structural hole. To further straighten the relationship between farmers, other business entities, and the government, farmers will use organizational governance (e.g., forming community cooperatives) to social relations network organizational governance structural hole. They also consolidate their advantages into the ‘mutual-benefit’ market transaction network. On the other side, professional farmers will initially occupy the governance structure of the social network organization and facilitate the integration and development of business entities in the community (by forming a community cooperative) with the help of administrative authorities to realize consistent collective action.

However, to maintain high-quality development, community

cooperatives need to occupy the ‘mutual benefit’ structural hole of the market trading network; they need to promote an interactive governance environment between internal elements and commodity transaction contracts through a standardized construction of cooperatives.

4 CASE STUDY

The four cases selected for this paper are from SF Family Farm, LK Fruit Cooperative, JF Farmer Cooperative from Shandong Province, and WBL Fruit Cooperative in Zhejiang Province, China, respectively. Four typical cases in the provinces of Shandong and Zhejiang are selected based on the following three considerations. Firstly, both Shandong and Zhejiang Provinces are among the top provinces in China regarding the number of new professional farmers. Shandong Province is a traditional agricultural province, and the value of its agricultural output has ranked first for 31 consecutive years. It is also a province with very rapid industrialization and urbanization. Shandong Province also has a distinctive development of agricultural business entities, with 220,000 farmer cooperatives and 82,000 family farms, which are among the highest in the country. Shandong Province has many migrant workers, and many migrant workers return to their hometowns to start their businesses. Meanwhile, Zhejiang Province is the most market-oriented province in the Chinese agriculture industry. It ranks second in China regarding industrialization and urbanization (the first is Guangdong Province). The primary industry of Zhejiang Province is cash crop cultivation. The total value of agricultural output of Zhejiang Province in 2020 was 159 billion CNY, and the per capita net income was 7336 CNY, ranking third in China. The development trend of integrating the three industries of agricultural production, processing and marketing is apparent in Zhejiang Province. Therefore, the study of professional farmers in these two provinces is representative of the sample. Secondly, there are significant differences in the influence of government agricultural policies in the two provinces. The agricultural industry in Zhejiang Province is highly market oriented. Professional farmers choose their entrepreneurial projects more according to the laws of the market with weaker government intervention. Thirdly, agricultural operations in Shandong Province are influenced by both the market environment and government policy intervention, making the agricultural development of the two provinces unique. Finally, the four cases selected in this paper are all fruit crops, making it possible to avoid selection bias in the sample.

SF family farm locates in D Town, Guangrao County, an

industrial agglomeration of tire manufacturers in China. Most farmers work in local tire enterprises, and agricultural operators gradually decrease. SF Family Farm is engaged in producing and selling selenium-rich purple carrots. In addition, the government supports the SF farm on access to production materials (such as land transfer and capital investment). These factors allow the SF farm to more easily obtain the production factors needed for planting and be less affected by negative externalities in development.

LK Fruit Cooperative locates in the MYD town of Laiyang City in Shandong Province. Laiyang City is a preeminent apple-producing area of China. This cooperative was established in 2014, with a registered capital of 2.16 million CNY and more than 3000 cooperative members. LK fruit cooperative's business scope covers the whole chain of high-quality apple production, processing, and marketing.

JF Cooperative, located in Laizhou City, Shandong Province, was established in 2018, mainly it engaged in organic millet's whole industry chain operation, with 206 cooperative members. The loss of the cooperative at the beginning of its establishment amounted to 700,000 CNY. Based on forming a series of millet products such as millet wine, millet instant porridge, and millet oil, the cooperative fully uses self-media marketing (such as WeChat Official Account and TikTok) to promote the unique agricultural products of JF Cooperative. The production of agricultural products of the cooperative realizes sales-based production, and the net income generated by the cooperative in 2019 reached 340,000 CNY. The per capita income of the cooperative members increased by more than 14,000 CNY.

WBL Cooperative locates in Yongquan Town, Taizhou City, Zhejiang Province, one of the preeminent citrus-producing areas in China. The cooperative was founded in 2002 and reorganized in 2007. Recently, the cooperative has had a planting area of 540 ha of citrus and 340 ha of prunes. The cooperative has achieved an annual sales value of more than 60 million CNY and a profit of 4.5 million CNY.

In December 2018 and June 2019, we conducted semi-structured interviews with one general manager and seven ordinary farmers from SF Farm, LK cooperative, JF cooperative in Shandong Province, resulting in 52,000-word interview notes. In July 2019 and January 2020, we visited the WLB cooperative in Zhejiang Province twice to interview two prominent members and five ordinary cooperative members, resulting in 20,000-word interview notes. Table 1 shows the detailed information for each case.

5 CROSS-CASE ANALYSIS

5.1 Occupying the structural hole of market transaction networks

In Case 1, the leader of the SF family farm, Miss Liu, graduated from Qingdao Agricultural University and under her professional knowledge and marketability, produced selenium-rich purple carrots. Through scientific process management and advanced marketing means, she focused on online sales and foreign export orders, achieved her goal of determining production by sales, and quickly occupied the market transaction network structural hole. As a result, SF farm became the largest producer of purple carrots in the province (the planting area expanded to 140 ha). Specific data are given in Table 2.

In Case 2, Mr. Lin, the cooperative director of the WBL cooperative, gave full play to his international vision and market management capabilities upon assuming his role. After introducing the Japanese Nakagawa tangerine species and the new cultivar Yong-Quan No.1, the cooperative's market recognition of the tangerines significantly improved. Lin effectively filled the market transaction network structural hole by focusing on the high-quality fruit market. Mr. Lin effectively fills the structural hole in the market trading networks. However, the success of entrepreneurial behavior relies on the development of the rural cooperative. In this case, Mr. Lin needed to establish a cooperative to share the benefits of the cooperative with ordinary small-scale farmers and thus gain the scale of land needed for large-scale operations. After a few years of hard work, Mr. Lin can earn more than 4.2 million CNY annually. Also, as a leader of a professional cooperative, he was elected representative to the Taizhou People's Congress in 2020. Detailed data are given in Table 2.

In Case 3, the leader of the LK cooperative focused on product quality improvement and cooperative connotation building. Through the authoritative governance of community managers, the cooperative upgraded the fruit trees rapidly, which effectively enhanced the market value of the cooperative's product. As a result, the cooperative management occupied most of the holes in the market transaction network structure of the apple industry. Exceptionally, the LK cooperative occupied the structure hole in the market transaction networks before occupying the structure hole in the organizational-governance social networks. In Case 3, Mr. Zhang launches a cooperative in which his apple processing plant can obtain an

Table 1 Case introduction and characteristics summary

Item		Case 1	Case 2	Case 3	Case 4
		SF family farm	WLB cooperative	LK cooperative	JF cooperative
Established time		2014	2007	July 2014	June 2018
Professional farmer status	Pre-entrepreneurship	Undergraduate student	International students in the UK	Chairman of LK Fruit and Vegetable Co., Ltd.	General Manager of Cosmetics Sales Company
	Current	Owner of larger-scale farm	Leader of cooperative	Leader of cooperative; rural community leader	Leader of cooperative; rural community leader
Industry		Sales of selenium carrot	Whole industry chain of citrus	Apple's entire industrial chain	Whole industry chain of millet
Effectiveness		Moderate scale planting	The cooperative operates on a large scale, and the operating income increases significantly	Cooperatives grow on a moderate scale and improve their profitability	Form the characteristic industry chain of millet
		Production depends on sales	The average annual income of cooperative members is 23,000 CNY	The average annual income of each cooperative member exceeds 13,000 CNY; cooperatives invest more than 500,000 CNY annually to build village collectives and transform public service facilities	Standardized operation of cooperatives
Characteristics		Self-development family farm	Realize the common improvement of the income of entrepreneurs, cooperatives, and ordinary members	Form the characteristic industry chain of millet; standardized operation of cooperatives	Establish an integrated community co-op and obtain mutual benefits for the co-op leader, ordinary co-op members, the co-op, and the community through economic incentives

Table 2 Benefits for participants in cases

No.	Year	Net income of professional farmers (CNY)	Net income of cooperatives (CNY)	Net income of enterprise (CNY)	Net income of rural community organization (CNY)	Benefits for cooperative members (CNY)
Case 1	2018	7,000,000	–	–	–	–
Case 2	2018	1,270,000	4,230,000	–	–	22,200
	2019	1,290,000	4,300,000	–	–	23,800
Case 3	2019	–	32,700,000	21,200,000	11,300,000	12,000
	2020	–	33,050,000	24,520,000	11,500,000	14,000
Case 4	2018	–	32,000	–	–120,000	–
	2019	–	340,000	–	200,000	14,000
	2020	–	470,000	–	254,000	16,500

Note: Dashes indicate unavailable data.

abundant apply supply. Also, the cooperative can increase its production capacity steadily. Specific data are given in Table 2.

In Case 4, the JF cooperative fully exploited the market potential of native millet and ancient rice planting in the village, implemented millet industry chain management,

developed the millet industry chain, and significantly improved its operation efficiency by focusing on process management and brand marketing. Exceptionally, the JF cooperative occupied the structure hole in the organizational-governance social networks before occupying the structure hole in the market transaction networks. Specific data are given in Table 2.

In summary, when professional farmers can engage in the modern agriculture project with high value-added and good market prospects, it will immensely help them omit their advantages in opportunity identification and value transformation. Meanwhile, farmers can quickly occupy the structural hole of market transaction networks. Therefore, Viewpoint 1 is proven.

5.2 Differentiated market networks and heterogeneity matters

In Case 1, the SF family farm is in D Town, an industrial cluster of tire manufacturers in China. Local rural communities can generate stable economic income by building and leasing standardized workshops, resulting in a low degree of intervention in developing agricultural projects by local entrepreneurs returning home. The SF farm can quickly agree with the villagers regarding the large-scale land transfer. SF farms can also easily find short-term seasonal agricultural workers from the rural labor market. As a result, the SF farm focuses on large-scale planting, achieves effective transaction control cost through large-scale production and enterprise operation, and occupies the 'self-benefit' structural hole in the market transaction network.

In Case 2, Mr. Lin observed a high local labor cost and difficulties in land transfer with local small-scale farmers. Therefore, Mr. Lin could not occupy the 'self-benefit' structural hole in the market transaction network. By establishing cooperatives, the whole process of social service and the second-rebate distribution mechanism could be implemented to make the majority of the members recognize the cooperative's business philosophy. This mechanism encourages members to engage in such philosophy actively and reduce the uncertainty in agricultural products trading and factor allocation between the cooperative and its members. Therefore, professional farmers like Mr. Lin occupied the 'mutual-benefit' structural hole. Smallholders also receive the necessary productive agricultural services through participation in modern agricultural projects run by professional farmers. Smallholder's asset specificity and agricultural income increase together. Detailed data are given in Table 2.

When professional farmers in economically developed areas can quickly obtain production factors, they occupy the 'self-benefit' structural hole in the economic network through self-development. However, when the factors of production cannot be guaranteed through market trading behavior, these farmers can establish cooperatives to occupy the 'mutual-benefit'

structural hole to increase their own and other participants' income. Therefore, Viewpoint 2 is proven.

5.3 Embedding the condition of binary structural holes

In traditional agricultural areas, mutual-benefit cooperation among cooperative members, leaders, cooperatives, and grassroots communities can be achieved by developing a cooperative economy (i.e., by occupying the 'mutual-benefit' structural hole of the market transaction network). For example, suppose professional farmers cannot quickly secure the factors of production and reach a stable commodity transaction contract with local smallholders. In that case, they should focus on filling the structural holes of the market network at the economic level.

In Case 3, the LK cooperative established by professional farmers achieved significant increases in operating income and risk control capacity of asset specialty by offering economic incentives, such as secondary rebates and high-quality socialized services for its members. However, the cooperative faces difficulties meeting its needs and establishing a high-quality apple agricultural supply chain. Therefore, based on economic cooperation, the LK cooperative shifted to a community type, encouraged the participation of villagers in governing social relations, solved the problems related to the replacement of fruit trees and the lock-in of cooperative specific assets, and effectively promoted high-quality development. Figure 3 presents the evolutionary path map in detail.

In Case 4, The JF cooperative found the proper market positioning developed a supply chain of one-village-one-product characteristic agricultural products. Also, it promoted the standardization of production and management of members through the whole process of socialized service supply. It also consolidated the economic cooperation between members and cooperatives. The evolution path is shown in Fig. 4 and the growth of benefits for cooperatives, rural communities, and cooperative members in Table 2.

Specifically, after occupying the structural hole of the market transaction network, professional farmers need to continue to reduce the transaction costs of production factors with rural communities and smallholders. Therefore, professional farmers will further occupy the organizational governance structural hole of the social relationship networks. Professional farmers lead rural communities and support cooperative economic development through authoritative governance. Similarly,

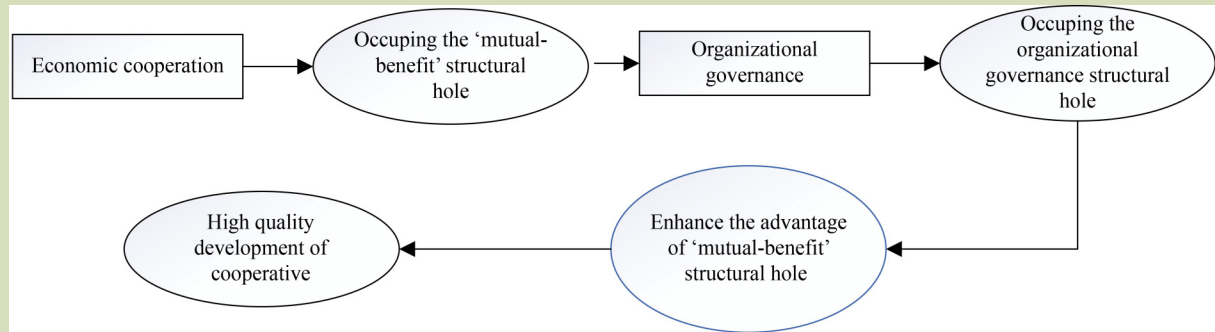


Fig. 3 Evolutionary path map from economic cooperation to organizational governance.



Fig. 4 Evolutionary path from organizational governance to economic cooperation.

when professional farmers occupy the organizational governance structure hole of the social relationship networks, their goal is to have better access to productive resources and lower transaction costs of production factors. These actions promote them better to occupy the structural hole of the market transaction networks. Thus, Viewpoint 3 can be justified.

5.4 Discussion

This analysis uses the structural hole theory in social network analysis to discuss the path selection of new professional farmer entrepreneurship in rural China. Several key ideas are presented and argued through comparative case studies. Firstly, when professional farmers achieve substantial success in their entrepreneurial projects, they must occupy the dominant structural holes in the market transaction network (obtain the dominant niche position in the agricultural supply chain). Secondly, professional farmers will prioritize occupying the structural holes of social networks and promote the emergence of their structural hole dominance in market transaction networks through the advantage of social capital

when this process cannot continue. The principle is that having the advantage of occupying the structural holes of social relationship networks will make the process of occupying the structural holes of market transaction networks easier for these farmers. By occupying the structural holes of 'multi-benefit' market transactions networks and the networks of organizational governance, professional farmers have achieved individual entrepreneurial success and steady growth of their cooperatives.

The advantages of the material presented here are threefold. Firstly, it analyses the choice of entrepreneurial pathways of new professional farmers using the theory of structural holes in a multi-case comparative study. It is argued that whether new professional farmers choose different business models and integrate with cooperative organizations is important because they rely on their entrepreneurial ability and social capital position to make rational choices. Secondly, it analyses the political logic behind China's current initiative to encourage agricultural innovation and entrepreneurship by encouraging returning entrepreneurs to rely on cooperative organizations. Finally, although the arguments presented here are based on cases in rural China, the relevant theories also provide

references for entrepreneurs returning to developing countries to choose appropriate enterprise projects.

In China, many rural workers move to towns, while many urban workers/entrepreneurs choose to start their businesses in rural areas. Eastern China has a more developed market economy and faces strict policy constraints. Rural areas in eastern China have distinctive market-oriented and planned economy characteristics.

Studying the entrepreneurial behavior of returning entrepreneurs in these regions and analyzing the influence of policy intervention and market behavior will provide a valuable theoretical basis for more developing countries returning entrepreneurs to balance the influence of market and government intervention in the future entrepreneurial process and achieve entrepreneurial success.

The shortcomings of this analysis are twofold. Firstly, the corresponding cases come from only two provinces in China (Shandong and Zhejiang), which are relatively unrepresentative and comprehensive. Secondly, this material focuses more on the analysis of typical cases in the structural hole study and less on the use of more precise mathematical and rational analysis to portray them.

6 CONCLUSIONS

Through adopting structural hole theory, this analysis of four entrepreneurship cases of professional farmers with different development paths proves that their success can be reduced to three aspects. Firstly, the success of professional farmers stems from the fact that they can occupy the critical position of the structural hole in the market transaction network of agricultural products. Secondly, suppose the local factors of production are highly market-oriented in economically developed areas. Professional farmers will occupy the ‘self-benefit’ structural hole of the market transaction network if they cannot occupy the ‘self-benefit’ structural hole. They can share some of their benefits or resources with other stakeholders and occupy the ‘mutual-benefit’ structural hole. Thirdly, in traditional rural areas with more non-market factors that can affect economic performance, professional farmers occupy the organizational-governance structural hole

of the social relationship network and the ‘mutual-benefit’ structural hole of the market transaction network. Depending on the local social and economic conditions, occupying the organizational-governance structural hole before completing the “mutual-benefit” structural hole order or occupying the “mutual-benefit” structural hole before the organizational-governance structural hole does not pose a problem. These two can stabilize cooperative relationships and help achieve a mutual-benefit situation among rural communities, cooperatives, farmers and entrepreneurs. While this is theoretical research based on the multi cases of China, it has practical implications for developing countries. Given the proliferation of professional farmers in economically developing countries, the development of professional farmers requires a large-scale operation model, a commercialized market environment, and harmonious rural community development conditions. The compatibility of the development of professional farmers with the realization of small-scale farmer production becomes an important issue for the success of modern agriculture in three ways.

Firstly, providing a fair development environment for modern agricultural development. It will help those developing countries develop modern agriculture projects and cultivate professional farmers with entrepreneurial abilities when Providing farmers with a fairer and more equitable trading environment for agricultural production factors and reducing negative externalities of factor acquisition.

Secondly, professional farmers can rely on rural cooperatives to develop modern agricultural projects. Cooperatives are beneficial to vulnerable smallholder farmers. Cooperatives will obtain a better development environment and cheaper materials through cooperation and shared economic benefits, essential for modern agricultural projects to succeed.

Thirdly, the support of rural communities is a guarantee of success for professional farmers. Providing social services to rural communities and promoting their development will contribute to the success of modern agricultural projects and professional farmers. It will be crucial for developing countries to promote the modern agriculture and train professional farmers if those countries can promote the compatibility of incentives to develop cooperatives and rural communities.

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Compliance with ethics guidelines

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