

A Review of Research on the Dilemma and Way Out for the Development of "Company+Farmer" Model

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Abstract

The "company + farmer" model in agricultural industrialization faces fraud risks and regulatory hurdles. Solutions include integrating government subsidies with blockchain and remote sensing to enhance transparency, adopting market-driven mechanisms like credit systems and insurance, promoting equity partnerships such as Wen's stake-holding model to align interests, and deploying IoT/big data paired with farmer training to bridge the digital divide. Future innovations like agricultural metaverse, AI monitoring, and a national credit platform could further improve cooperation efficiency, with real-world cases validating these approaches.

Keywords

"Company+Farmer" Alliance; Development Dilemma; Fraud Prevention and Control; Research Review

1. Introduction

As an important form of organization for the industrialization of agriculture in China, the "company + farmer" model has played a key role in promoting the organic connection between small farmers and modern agriculture, reducing market risks and improving the efficiency of agricultural production. However, with the extensive promotion of this model, the problems in its operation process have gradually emerged, especially the enterprise in the acquisition of yield fraud, seriously harming the interests of farmers, restricting the sustainable development of agricultural cooperation model. In recent years, academics have conducted extensive research on the operation mechanism, benefit distribution, risk prevention and regulatory optimization of the "company + farmer" model, but a systematic theoretical framework has not yet been formed to deal with the reality of the fraud problem.

Existing literature mostly explores the cooperative relationship between enterprises and farmers from the perspectives of contract theory, transaction cost theory or

game theory, but the research on the causes, impacts and governance strategies of fraud is still relatively scattered. Some scholars focus on the impact of contract incompleteness on the stability of cooperation, while other studies focus on the governance effects of government regulation or third-party intervention, but lack comparative and integrated analysis of different governance models. In addition, with the development of digital technology, blockchain, smart contracts and other emerging means provide new ideas for preventing fraud in agricultural cooperation, but the relevant research is still in the exploration stage.

In this paper, we systematically review the domestic and international literature on fraud and its governance in the "company+farmer" model, explore the progress and shortcomings of the existing research from the dimensions of contract design, regulatory mechanism, and technological empowerment, and look forward to the possible optimization direction in the future. The study aims to provide theoretical references for the construction of a fairer and more efficient agricultural cooperation model, and at the same time to provide a decision basis for policy makers to improve the regulatory system and protect the rights and interests of farmers.

2. Literature Review

Looking at the economically developed countries of the world, none of them is an agricultural powerhouse. "Food for the people is heaven", to ensure a stable and safe supply of food and other important agricultural products, is 'the country of the great'. China is currently a large agricultural country rather than an agricultural powerhouse, to build our country into an agricultural powerhouse is of great significance to the realization of the great rejuvenation of the Chinese nation. Although China has realized the overall well-off, but the three rural issues are still the focus of our country's key areas.

Improving farmers' income not only solves the "three rural issues", but also promotes rural revitalization. Private enterprises can help realize rural revitalization by assisting the traditional farming industry. In the agricultural industry, the long production cycle of agricultural products, the lack of timely market information for farmers, and the large upfront investment have increased the business risk of the agricultural industry. In reality, the integration and development of the three rural industries in Jiangsu Province has problems such as low integration level and homogenization of industries, and the cultivation of large-scale leading enterprises is one of the important initiatives to solve these problems. Based on this, the "company + farmer" model plays an important role in the process of agricultural development.

2.1. Development Issues

The "company + farmer" model has the advantages of tax exemption, stabilization of the supply of goods and risk-sharing. However, there are some problems in the de-

velopment of this model. Liu et al. found that in reality, there is no absolute advantage or disadvantage between the company and the farmers, and as long as the company and the farmers do not fully cooperate, there will be a loss of efficiency[1]; however, in the "company + farmers" model, the root cause of the major food safety problems lies in the asymmetry of information between the company and the farmers; analyzed through the study, one of the difficulties in the operation of the model is that the farmers have been educated, and they have no access to the information, so they are not able to access the information. One of the difficulties in the operation of the model is that farmers generally have a low level of education and have a tendency to behave opportunistically; even in the "leading enterprise + farmers" cooperation model, the contract is unstable and weakly binding in the real situation. Farmers are in a weak position in the trading market, which undoubtedly increases the likelihood that enterprises will tend to engage in fraudulent behavior in order to make illegal profits. Transaction fraud problems in the agricultural economic problems are numerous, on the fraud aspects of the study, first, the level of regulation and other factors have a greater impact on the competitive strategy of ordinary product companies and ecolabeled product companies with labeling fraud. Second, government regulation combined with subsidy policy has a better effect on constraining food price fraud. Third, agricultural e-commerce credit evaluation system to solve the problems of e-commerce fraud and dishonest transactions.

2.2. Restrictive Measures

2.2.1. Government Regulation

Government regulation can restrain and regulate the behavior of contracting parties. The influence of government tax subsidy on "company + farmer" type order agriculture supply chain occurs under certain conditions, the government tax subsidy coefficient can effectively constrain the decision-making behavior of the supply chain members, because increasing the subsidy can increase the income of farmers, thus reducing the speculative behavior of farmers; Ying F et al. studied the impact of government tax subsidies on the "company + farmer" type of contract farming supply chain, and found that under certain conditions, the government tax subsidy coefficient can effectively constrain the decision-making behavior of supply chain members[2]. Yang Q et al. used the game method to study the competition and structure of the "company + cooperative + farmers" type supply chain, and found that the government can control the number of cooperatives, the degree of concentration of cooperatives, and the number of farmers in the cooperative, which can effectively improve the disadvantageous position of farmers in the market, but also control the quality of agricultural products, and improve the brand value and influence of agricultural products[3]; Liu X and Hu S used the method of evolutionary game to study the impact of government subsidies on the diffusion mechanism of eco-agricultural technological innovation, and found that if government subsidies to

companies, cooperatives or farmers are too low, the game system will be difficult to converge to the ideal equilibrium point, and that the government should coordinate the equilibrium and implement reasonable subsidies for each game subject[4].

Generally speaking, the government requires that "company + farmer" contracts must be filed with the government's agricultural department, clarifying the rights and responsibilities of both parties, yield targets, and the distribution of subsidies, avoiding verbal agreements or contracts of yin and yang. Dynamics also include random and flying inspections: the government, in conjunction with the auditing and agricultural departments, conducts random inspections of subsidized projects from time to time, with a focus on checking the flow of funds and production records (e.g., purchase vouchers for agricultural materials, sales tickets). But only supervision can not achieve the desired effect.

2.2.2. Equity Cooperation

Diwakar KC et al. believe that the cooperation model of "dragon-head enterprises + farmers" has the problems of unstable contract and weak binding force in the real situation[5]. In the traditional "company+farmer" model, farmers usually sign order contracts with the company as producers (e.g., guaranteed purchase), but this model is prone to fraudulent behavior (e.g., misrepresentation of production, substitution of good for good) due to asymmetric information and unequal distribution of benefits. In contrast, the equity cooperation model allows farmers to become "shareholders" of the company by investing in the company with land, labor or production materials, binding the interests of both parties in depth, thus reducing the incentive for short-term fraud and enhancing the stability of long-term cooperation. Farmers can become shareholders in the company through the following forms: First, land management rights: farmers will convert the management rights of contracted land into equity, and the company will unify the planning of planting or breeding. Second, the labor force into shares: farmers participate in production management, according to the contribution of labor commuted to shares (such as farms according to the amount of feeding). Thirdly, production materials: farmers use physical assets such as farm machinery, livestock, greenhouses, etc. to invest in shares. Among them, the land management right is the most popular form of shareholding.

Based on this, farmers' income no longer relies only on fixed purchase price or subsidies, but consists of guaranteed income (optional), share dividends, labor wages, etc. This also means that the better the company's profitability, the higher the farmer's dividends, and if the farmer commits fraud (e.g., steals and sells the products), it directly affects the company's profitability, which in turn reduces its own dividends.

2.2.3. Market-based Disciplinary Mechanisms

Market-based constraints make fraud "uneconomical" through market forces such

as insurance, finance, traceability, and credit systems, thus naturally reducing the incentive for farmers to violate the law. Take insurance as an example, companies or farmers buy agricultural insurance (such as planting insurance, breeding insurance), the insurance company based on historical data to set payout standards. If farmers misrepresent their losses to defraud the insurance company, the insurance company will refuse to pay compensation through random checks (e.g. drone inspections, third-party assessments) and will be blacklisted. An important role of insurance is the anti-fraud role, and insurance companies have incentives to verify the authenticity of data and reduce the behavior of farmers who misrepresent disaster losses. For example, pig farming insurance in a certain place requires each pig to be ear tagged, and death claims need to be photographed + veterinarian certification, otherwise the claim will be refused.

In addition to insurance, fraud prevention can also be realized through order financing constraints, which work by the company providing farmers with advances through the bank, but requiring farmers' production data (e.g., acreage, number of farms) as the basis for the loan. The bank will spot-check the farmers' real production situation, and if fraud is found (e.g., misrepresentation of scale), the loan amount will be reduced or the funds will be withdrawn in advance. In other words, if farmers want to obtain stable financing, they must provide real data, or else their credit records will be affected.

2.2.4. Mechanisms Farmers' Credit Files

In the "company + farmer" cooperation model, the farmer's credit file is a binding mechanism based on market-oriented means, which forms a quantifiable credit score by recording the farmer's production, transaction and performance, thereby incentivizing honesty and disciplining fraud. Its core role is to reduce information asymmetry, incentivize long-term integrity and punish fraud. The data sources of farmers' credit files are multifaceted, including production data, transaction records, financial credit, etc., and the scoring generally adopts a weighted scoring method, adding or subtracting points from different data records, and then dividing the final scores into credit ratings to give "excellent" farmers multi-dimensional subsidies and support. "Unqualified" farmers are penalized.

3. Case Study

When Zhengda Group promoted the "Company + Farmers" hog farming in Shandong Province, it was faced with the problems of farmers misreporting their stock and selling their hogs privately, so it launched the digital credit management platform "PigNet". The network adopts the mode of "intelligent ear tag + Internet of Things" in data collection, i.e., each pig wears an ear tag, which automatically records its weight and stock, and the data is uploaded to the platform in real time. Zhengda Group will form a closed loop supply chain, with feed being uniformly distributed by

Zhengda, and pigs being weighed in Zhengda's slaughterhouse at the time of slaughter, eliminating private transactions. The Group also uses a credit scoring model with metrics such as stock veracity, feed conversion rate, and on-time delivery and sale. Farmers with grade A scores can obtain "unsecured breeding loans" from Zhengda (with interest rates 2% lower than the market), and are given priority in piglet supply. C-grade farmers are required to pay 30% of the feed in advance, and the purchase price per kilogram is reduced by 0.5 yuan at the time of slaughter. The final result: the average misreporting rate of farmers dropped from 12% to 3%, and the company's annual cost savings exceeded 20 million yuan; the willingness of credit A-grade farmers to expand their production capacity increased by 40%, forming a virtuous circle.

A sugar group in Guangxi signed order contracts with sugarcane farmers, but some farmers resold their sugarcane to other sugar mills at high prices, resulting in a shortage of raw materials, so the group established a tripartite credit file. The bank is responsible for recording the repayment of the farmers' loans. The sugar mills are responsible for recording cane deliveries and fulfillment rates. The government provides data on land rights and subsidy payments. Dynamic credit incentives and penalties are used, including credit points for 100% compliance with cane delivery for three consecutive years, a 20% increase in the maximum planting area the following year, and credit points for participation in technical training at the sugar mill. Points are deducted for fraud, including detection of sugarcane diversion. The model also uses a market-based disciplinary tool to insure the price of sugarcane, with premiums linked to credit scores (50% premium subsidy for A-rated farmers). Supply chain finance is also used, with banks lending on the basis of credit scores and A-ranked farmers being able to advance 30% of the purchase price. Final results: sugarcane default rate reduced from 18% to 5%, stability of raw materials in sugar mills improved; average income of farmers increased by 12% (due to premium purchase + insurance payout).

4. Research Conclusions and Future Outlook

Through the study of fraud prevention and control mechanisms in the "company + farmer" model, this paper draws the following core conclusions: (1) Optimization of government subsidies and strengthening of regulation can reduce short-term fraud, but it is necessary to rely on digital tools (e.g., blockchain, remote sensing monitoring) to improve transparency and avoid excessive administrative costs. (2) Market-based constraints (e.g., credit files, insurance, supply chain finance) are more sustainable because they automatically regulate farmers' behavior through economic incentives. Typical cases (e.g., Zhengda's "pig network" and Guangxi's sugar enterprises) show that the fraud rate can be reduced by 50%-80%. (3) Equity cooperation model in large-scale agriculture is effective, through the interests of binding (such as Wen's shareholding plan) will be fraudulent incentives for farmers into a

long-term cooperation motivation. (4) technology-driven (Internet of Things, big data) is the future trend, but the need for supporting farmer training and low-cost equipment promotion, otherwise easy to create a "digital divide".

The future "company + farmer" model can deepen the integration of digital technology, explore the "agricultural meta-universe" and other virtual regulatory scenarios, and identify production anomalies (e.g., sudden changes in the number of pigs, crop growth deviations) in real time through AI. It is also possible to build a nationwide credit platform for farmers: integrating data from governments, enterprises and financial institutions, and establishing a cross-regional blacklist sharing mechanism, but privacy protection and data ownership issues need to be resolved. In addition, innovative risk-sharing tools can be used, such as "blockchain+insurance+futures" combination products, so that farmers, companies, and the market can jointly hedge the risk of fraud.

The theoretical contribution of this paper is that it proposes a three-dimensional prevention and control framework of "system-market-technology", emphasizing the core role of market-based constraints; the practical significance of this paper is that it provides a replicable path for the compliance of contract farming in rural revitalization.

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