Empirical Research on Influence Factors of "Leading Enterprise + Farmer" Channel Stability – Taking Personal Relation as the Regulated Variable

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Abstract In the cooperation model of leading enterprise + farmer, channel stability is always a prominent problem. Based on previous researches, taking farmers in Hainan region as investigation object, the influence factors of channel stability of leading enterprise + farmer are studied by combining the background of formal contract and using the combination method of theory and demonstration. Contract item design, trading cost, product specificity, power structure, information asymmetry and social relationship are contained in analytic framework to establish theoretic model. Research results show that in formal channel management, when contract clause design is more explicit, product specificity is stronger, power structure is more balanced, information share degree is higher, and trading cost is lower, channel is more stable, and farmer's willing to renew contract is stronger. Meanwhile, social relationship plays stronger regulation role.

Key words Formal control, Channel stability, Relationship, Influence factor

1 Introduction

The existing marketing channel of agricultural product in China mainly involves several models: farmer + rural broker + intermediate businesses at all levels, farmer + leading enterprise, farmer + agricultural professional cooperative + leading enterprise, farmer + production base + agricultural professional cooperative + leading enterprise. Here, the model of farmer + production base + agricultural professional cooperative + leading enterprise has the most significant effect. In the model, cooperative acts as an intermediary, and improves stability of trading relationship and performance to a certain degree. But because that rural economic cooperation organization of China is at initial development stage, the marketing model of leading enterprise + farmer is still dominant[1]. Under the situation, contract agriculture becomes a new market organization form and develops fast. Contract agriculture and the model of leading enterprise + farmer commonly solve the connection problem between "big market" and "small farmer" [2]. But the model is not stable in actuality. Although acceptance degree of farmer to the contract agriculture is very high, actual performance rate is not ideal[3]. In recent years, scholars at home and abroad study channel stability of leading enterprise + farmer, including two aspects: influence factors of channel stability [1, 3-5] and control mechanism of channel[6-7]. Actually, formal channel control embedded cooperation relationship between the two sides is more stable, and channel stability could promote long-term cooperative relationship between the two sides. But there are fewer researches about the influence of social relationship on channel stability by taking it as regulated variable. Therefore, social relationship between the two sides is taken as regulated variable and introduced in analytic framework, to explore its regulation role on influence factors of channel stability.

2 Literature review

By summarizing the related literatures, it is found that there are a lot of researches about channel of agricultural product, and most of researches concentrate in the angle of channel stability. Some scholars discuss influence factors of channel stability. For example, Zhao Xiaofei *et al.* pointed out that primary cause of channel stability is interest driven and distribution, which was verified by mathematical model [1]. Wu Zhiyong *et al.* found that penalty is an important guarantee of channel stability[8]. Cao Yanai summarized influence factors of channel stability into asset specificity, contract item design, operation models of company and farmer, social factor and relationship strategy[5]. Liu Gang established theoretic model for influence factors of contract type of agricultural product channel stability from the perspective of integrated governance[3]. Farmer's specific asset investment could strengthen buyer's trust, further promoting the relationship stability between the two parties. Zhang Chuang *et al.* thought that cooperation and conflict are important causes affecting channel stability[9]. Channel instability is also caused by imbalance of power structure. By establishing cooperation organization of agricultural product and declining scarcity of leading enterprise, imbalance problem could be improved[4]. Some scholars discuss the influences of different control mechanisms on channel stability. Zhang Chunxun studied the influence of relationship control on channel stability, and put forward that trading subject of agricultural product, object itself characteristic, intrinsic limitation of agricultural product trade contract and trading environment of agricultural product are all in-

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fluence factors of agricultural product trade stability[10]. Tian Min pointed out that contract type of control mechanism and relationship control have important impacts on channel opportunistic behavior. Xu Jian proved important effects of interpersonal relation and channel behavior in contract treatment by studying the relationship between farmer interpersonal relationship network structure, channel behavior and contract type of agricultural product trading relation stability[6]. On the basis of traditional control mechanism, Yang Liangliang studied channel stability of agricultural product by using two kinds of control mechanisms: authority governance and standard governance[11]. As research deepens, scholars start to innovate new control mechanism – psychological contract governance. Cai Wenzhu *et al.* proposed that the content of psychological contract hidden in the hearts of farmer and leading enterprise is neglected in previous control mechanism, which causes dilemma and "governance failure" problems of traditional channel relationship control mechanism[7]. Overall, prior researches only explore the influence of control mechanism on stability, but after embedding a kind of "relationship" in formal contract, the contract becomes stable, and high default rate disappears. Actually, the essence of "relation" is trust, dependence and communication[12-13]. Macneil proposed relational contract theory, and thought that contract incompletion and characteristics of contract party play important role in contract. Zaheer *et al.* thought that relationship control is a kind of form between market control and hierarchy governance, and is internal privileged balance mechanism among trading parties. This kind of relationship could remedy absence of formal contract clause, thereby guaranteeing willing of each party of formal contract and continuity of cooperative trading behavior. In summary, social relationship is taken as regulated factor to be introduced in the model, and influence factors for channel stability of agricultural product are explored.

3 Research hypotheses

3.1 Channel relationship stability Channel relationship stability represents a kind of win-win cooperation, and is often defined as the tendency that an enterprise and the selected channel partner develop close interaction, and create value via cooperation[14]. Under normal condition, when channel relationship is more stable, operation efficiency of whole supply chain is higher, and corresponding performance is higher[15]. Kirti *et al.* thought that relationship stability contains two aspects: relationship length and relationship attitude. Most of scholars divide channel stability into two dimensions: current breaching tendency of both parties and willing to renew contract in next phase[3, 16].

3.2 Contract clause design and channel stability Cao Yanai pointed out that contract clause design could affect performance behaviors of two cooperative parties[5]. It is required clearly stipulating right and responsibility of channel member, as well as the penalty of opportunistic behavior and violating contract clause. Wang Aiqun *et al.* pointed out that to improve performance rate and inhibit speculative behavior, rational contract item could be designed according to trading characteristics of leading enterprise and farmer[17]. The research of Guo Hongdong showed that price clause of "purchasing by the minimum price and fluctuating in line with market conditions", guarantee clauses of "input requirement" and "incentive measure", and clear stipulation of "verbal agreement" have significantly positive impacts and very good guarantee roles on order performance[18]. Therefore, it is supposed that specific contract clause design has positive impact on channel stability (H_1).

3.3 Trading cost and channel stability Coase pointed out that trading cost contains the cost of finding price, the cost of negotiation and signing contract and the cost of implementing necessary check to guarantee contract clause implementation. Williamson divided trading cost into beforehand transaction cost (drafting contract and negotiating contract content) and afterward transaction cost (bargaining and guaranteeing contract performance). Cao Yanai *et al.* explored the relationship between transaction cost and channel stability in the model of company + farmer[5]. Zhang Chuang *et al.* proposed that four kinds of costs affect channel stability and decline transaction performance of the organization[9]. Because that the expense of company directly trading with farmer is high, and two parties both pursue the greatest interest, short-term behavior is prevail, and trading relationship is very unstable[9]. Zhao Xiaofei *et al.* proposed that transaction cost has significant impact on channel relationship stability. The higher the transaction cost, the worse the channel stability[1]. The channel management model of company + farmer realizes the replacement of market by enterprise, declines transaction cost, improves channel stability, and promotes channel performance by integration[5]. In cooperation process, the variation of farmer and company capital structure could change transaction cost, further affecting contract stability, and finally affecting channel stability. Therefore, it is supposed that transaction cost has significantly negative impact on channel stability (H_2).

3.4 Power structure and channel relationship stability Zhang Chuan *et al.* thought that power structure of channel has an important role in channel performance and channel stability. In the model of "leading enterprise + farmer", farmer has higher dependence on enterprise. Adding the advantage of leading enterprise in market information, it causes the situation that channel power tilts toward leading enterprise[4, 9]. The situation causes that conflict level between two parties is higher in transaction process, and cooperation level is lower, thereby inducing lower channel performance and unstable channel relationship. Cooperation and conflict, power structure, and power use manner in channel relationship have great impacts on stability of transaction relationship. In cooperation process of leading enterprise and farmer, farmer is in a weak position, while leading enterprise is in a strong position. The cooperative relationship is variable, and the situation of relationship deterioration or termination is easy to be generated[19]. Therefore, it is supposed that power structure has significant impact on channel stability (H_3).

3.5 Product specificity and channel stability Product specificity indicates the product produced according to transaction contract by farmer. If farmer does not sale product to cooperative party according to contract stipulation, there is larger loss[20]. Hou Shouli *et al.* thought that product and asset specificity is major factor deciding contract type in transaction relationship. By typical case study, Meng Fengping *et al.* thought that contract product specificity is basic precondition of analyzing channel stability problem. Via case study, Yin Yunsong *et al.* pointed out that product specificity is primary factor deciding commodity contract stability under the precondition of company keeping faith[20]. Yu Yaguai thought that thematic specificity investment has significant impact on channel stability under the precondition of unchangeable environmental condition. When specificity investment increases, channel stability also increases. Therefore, it is supposed that the stronger the product specificity, the more stable the channel relationship (H_4).

3.6 Information asymmetry and channel stability Simht defined communication among channel members as "the behavior of channel members sharing information, inter-touching and exchanging opinion via written matter, formal meeting or informal channel". Communication behavior is an important factor of developing channel relationship, and communication is conducive to stability and development of relationship among cooperative partners. Anderson *et al.* pointed out that effective channel structure operation needs information share[21]. In marketing channel of agricultural product, timely and effective communication could decline transaction cost and risk[12]. It is conducive to forming long-term and stable transaction relationship to enhance the communication between farmer and leading enterprise, promote information share, and increase mutual understanding and trust[9]. Cai Wenzhu *et al.* pointed out that in the cooperation of leading enterprise and farmer, poor communication and misunderstanding of certain information could cause that farmer and enterprise breach promise[7]. After studying 5 cases, Yin Yunsong *et al.* pointed out that adverse selection and moral hazard is generally driven by opportunistic behavior in information market. The larger the information asymmetry degree, the bigger the occurrence possibility of adverse selection and moral hazard[20]. Additionally, the larger the information asymmetry degree, the higher the transaction cost, the worse the channel relationship stability[1]. Therefore, it is supposed that information asymmetry degree has negative impact on stability of channel relationship stability (H_5).

3.7 Personal relation and channel stability Pure separation transaction is less in economic activity, and most of channel transactions involve relationship factors, and these relationship factors could be used to manage various relationships among channel members and coordinate channel activity. When personal relation between boundary personnel of leading enterprise and farmer is better, farmer's intention to renew contract is stronger, and breaching tendency is lower, and channel is more stable. In the cooperation between leading enterprise and farmer, when leading enterprise tends to make plan and solve problem with farmer, it illustrates that leading enterprise more values long-term and stable cooperation relationship with farmer[11]. It is clear that most of researches on channel stability concentrate in the influence of relationship control mechanism on channel stability. We think that in transaction process of leading enterprise and farmer, personal relation plays certain regulation role. Therefore, it is supposed that personal relation among channel members has regulation role on channel stability (H_6). Based on above analyses, the established theoretic model is shown as Fig. 1.

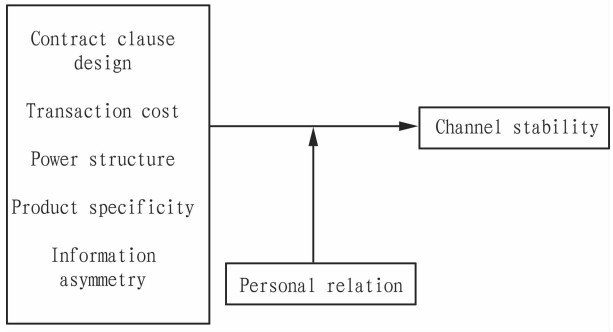

Fig. 1 The established theoretic model

4 Research methods

4.1 Sampling and data collection Channel relationship between leading enterprise and farmer which have formal contract transaction is taken as research object. In Hainan Province, farmers and managers of leading enterprises which have formal contract transaction are selected as investigation objects, and data are collected. Formal survey is implemented by students from College of Economics and Management, College of Grammar, Huazhong Agricultural University in Hainan. 520 copies of questionnaires are issued, and 515 copies of questionnaires are recovered, in which there are 510 copies of effective questionnaires, with effective recovery rate of 98.08%.

4.2 Measurement of variable Likert 5-score scale table is used, and score shows farmer's approval or acceptance degree on the problem. The clear degree of contract clause design refers to research scale table of Brown and Lusch. The measurement of transaction cost refers to the research of Zhang Chuang *et al*[9]. Using information search cost, negotiation cost, supervision cost and transportation cost, transaction cost is measured. Power structure scale table is revised according to the researches of Xu Jian *et al.*[6], to measure power structure in the channel of contract type of leading enterprise + farmer. The measurement of product specificity refers to the researches of Anderson *et al*[21]. The measurement of information asymmetry refers to the researches of Barclay *et al.*, which embodies communication and information share degree of leading enterprise and farmer in contract type of channel. Relationship measurement between leading enterprise and farmer refers to the researches of Crosby *et al.*, which embodies mutual understanding and trust between leading enterprise and farmer. The measurement of channel stability is revised according to the researches of Xu Jian *et al.*[4,6], and it is used to measure current

breaching tendency and renewal intention of farmer.

4.3 Data quality analysis

4.3.1 Reliability test. Using spss17.0, reliability and validity analysis of questionnaire data is conducted. Cronbach's α reliability coefficient is commonly recognized by scholars. According to the analysis of Nunnally, Cronbach's α less than 0.35 shows lower reliability; 0.35 – 0.7 shows moderate reliability; 0.7 – 0.9 shows higher reliability; more than 0.9 shows very good reliability. Therefore, 0.35 is taken as the minimum standard of measuring item in this paper. Reliability analysis results of dependent variable and independent variable by spss17.0 are shown as Table 1. Cronbach's α reliability coefficients of all potential variables are more than 0.5, which corresponds with the requirement. It illustrates that questionnaire has higher consistence and better reliability.

Table 1 The results of reliability analysis

Latent variable	Cronbach's α	Question number	Treatment method
Contract clause design	0.640	4	Accept
Transaction cost	0.730	4	Accept
Power structure	0.788	5	Accept
Product specificity	0.587	2	Accept
Information asymmetry	0.830	2	Accept
Social relationship	0.734	3	Accept
Intention to renew contract	0.892	3	Accept

4.3.2 Validity test. About content validity, index measurement of the questionnaire is all from the existing related research literatures, which has related theoretic basis, and corresponds with the requirement of content validity. In this paper, KMO and Bartlett sphericity test are used for factor analysis. According to the research, when KMO value is more than 0.50, sample is suitable for factor analysis. When significance probability of statistical value of Bartlett sphericity test is less than or equal to 0.05, sample could be suitable for factor analysis. Using SPSS17.0, correlation data of variable is calculated, and results are shown as Table 2 – 3. Significance probability of Bartlett sphericity test of variable at each dimension is 0.000, which is less than 0.01. Meanwhile, KMO value of each variable is more than 0.50, which corresponds with common research standard. It illustrates that factor analysis could be conducted.

Table 2 Factor analysis

Factor	Characteristic value	Variance explained amount	Cumulative explained amount
1	8.771	32.486	32.486
2	4.080	15.112	47.598
3	3.478	12.880	60.478
4	2.260	8.370	68.848
5	2.156	7.987	76.835
6	1.536	5.689	82.524
7	1.337	4.952	87.475

5 Empirical analysis and hypothesis test

5.1 Descriptive statistics of sample Seen from the recovered questionnaire, in the investigated farmers, man accounts for 78.8%, while woman accounts for 21.2%. In the investigation process, farmer's age is mostly 41 – 50 years old, accounting for 64.7%, and farmer more than 51 years old accounts for 23.5%, and farmer of 30 – 40 years old accounts for 11.8%, which is the fewest. Investigation finds that culture level of farmer mainly concentrates in junior high school, accounting for 41.2%, followed by more than senior middle school (polytechnic school accounts for 29.4%, and senior middle school accounts for 17.6%), and primary school and below accounts for 11.8%. Most of farmers are engaged in traditional agriculture, accounting for 52.9%, and some farmers are engaged in agricultural sideline, accounting for 47.1%. In recent years, the development of agricultural sideline also becomes a trend. These farmers have longer farming period, in which farming period of 21 – 25 years is the most, accounting for 29.5%; farming period of more than 25 years accounts for 23.5%; farming periods of less than 5 years and 16 – 20 years both account for 17.6%; farming period of 11 – 15 years accounts for 11.8% (Table 4). It illustrates that farming experience of farmer is sufficient, and they are engaged in agricultural production activity for a long time.

Table 3 The results of validity analysis

Latent variable	Question number	KMO value	The significance of spherical test
Contract clause design	4	0.659	0.000
Transaction cost	4	0.573	0.000
Power structure	5	0.615	0.000
Product specificity	2	0.500	0.000
Information asymmetry	2	0.500	0.000
Social relationship	3	0.612	0.000
Intention to renew contract	3	0.737	0.000

Table 4 The basic characteristics of the samples

Population characteristic index	Item	Percentage//%
Sex	Male	78.8
	Female	21.2
Age//years old	31 – 40	11.8
	41 – 50	64.7
	More than 51	23.5
Culture degree	Below primary school	5.9
	Primary school	5.9
	Junior high school	41.2
	Senior middle school	17.6
	Above junior high school	29.4
Major occupation	Traditional agriculture	52.9
	Agricultural sideline	47.1
Farming period//a	≤5	17.6
	11 – 15	11.8
	16 – 20	17.6
	21 – 25	29.5
	≥25	23.5

5.2 Empirical analysis on influence factors of channel stability Using SPSS17.0, multiple hierarchical regression analysis of data is conducted to verify theoretic hypothesis. In this paper,

contract clause design, transaction cost, power structure, product specificity and information asymmetry degree are taken as independent variables, and channel stability is taken as dependent variable to explore the influence of independent variable on dependent variable, and regression result is shown as Table 5. (i) X and Z respectively show independent variable and regulated variable. Here, X_1 is contract clause design; X_2 is transaction cost; X_3 is power structure; X_4 is product specificity; X_5 is information asymmetry degree, and Z is the relationship between leading enterprise and farmer. $X \times Z$ shows regulation effect of regulated variable. (ii) Seen from the first layer of regression in model 1, F value of regression equation is 18.183, which is significant at the confidence level of 0.01, illustrating that whole explanation ability of the equation is higher. Contract clause design shows significantly positive impact on channel stability of leading enterprise + farmer, with regression coefficient of 0.368. It illustrates that detailed degree of contract clause is very important in formal channel control, and H_1 is verified. Regression coefficient is −0.194, and H_2 is verified. Power structure has significantly negative impact on channel stability, with regression coefficient of −0.180. It illustrates that when power structure is not balanced, it tilts toward leading enterprise, and channel is more instable, and H_3 is verified. Product specificity has significantly positive impact on channel stability. It illustrates that when product specificity is higher in the cooperation process of leading enterprise and farmer, channel is more stable, and then H_4 is verified. Finally, information asymmetry degree in channel also has significantly negative impact on channel stability, with regression coefficient of −0.166. When information asymmetry degree is higher, probability of farmer breaching is larger, and channel is more instable, and H_5 is verified. (iii) Seen from three-layer regression results, relationship plays regulation role in channel stability of leading enterprise and farmer. Results show that F values of two regression equations introducing regulated item and interaction item are 29.511 and 82.901, which is significant at the level of 0.01. It illustrates that the two equations have better explanatory power on the whole. R^2 change amount of the second-layer regression model adding regulated variable increases by 0.165 than the first-layer regression, illustrating that explanation power of the equation is improved by 16.5%, and it is significant at the level of 0.01. Explanation ability of the third-layer regression adding interaction item is improved by 33.4% than the second-layer regression equation. After adding regulated factor, independent variable of each item is still very significant, and absolute value of regression coefficient increases. It illustrates that regulation effect of relationship on the five variables makes their roles on channel stability enhance, and H_6 is verified.

Table 5 The influence factors of channel stability and the moderating effect of relationship

Independent variable	Model 1	Model 2	Model 3
Constant item	−3.385***	−4.650***	−16.912***
Age	0.271***	0.355***	0.259***
Culture degree	−0.175***	0.238***	1.425***
Farming period	−0.269***	−0.309***	0.264***
X_1	0.368***	0.656***	11.963***
X_2	−0.194**	−0.338***	−10.193***
X_3	−0.180***	−0.312***	1.785**
X_4	0.418***	0.708***	−0.063
X_5	−0.166***	−0.191***	2.126***
Z		−0.573***	24.987***
$X_1 \times Z$			−24.778***
$X_2 \times Z$			−8.419***
$X_3 \times Z$			−1.589**
$X_4 \times Z$			1.367**
$X_5 \times Z$			−0.972***
F value	18.183***	29.511***	82.901***
Adjusted R^2	0.350***	0.515***	0.849***
$\triangle R^2$		0.165***	0.334***

Note: ** shows significance at the level of 0.05; *** shows significance at the level of 0.01.

6 Conclusions, countermeasures and suggestions

Based on previous researches, taking farmers in Hainan region as investigation objects, starting from channel theory of leading enterprise + farmer, and combining the background of formal contract, influence factors of channel stability of leading enterprise + farmer are studied by combining theory with practice. Contract clause design, transaction cost, product specificity, power structure, information asymmetry and social relationship are included in analytic framework to establish theoretic model. Research results show that in formal channel control, when contract clause design is more clearly, product specificity is stronger, power structure is more balanced, information share degree is higher, and transaction cost is lower, channel is more stable, and farmer's intention to renew contract is stronger. Meanwhile, social relationship plays stronger regulation role. Based on above conclusions, several suggestions are proposed. (i) Perfect design of contract item. Contract should clearly stipulate basic requirements of number and therapy, breaching item and penalty measures, thereby following the contract and investigating the behavior breaching the contract. (ii) Empirical research finds that information asymmetry problem exists in farmer and leading enterprise, and farmer does not have information advantage in negotiation process. It is suggested enhancing information share between farmer and leading enterprise. It could add the item of information support in contract design to promote farmer's ability of negotiation and grasping market, decline transaction cost, and enhance efficiency of whole channel. (iii) Unbalanced power structure could cause channel instability. In relationship channel of leading enterprise and farmer, right tends to leading enterprise. It is found that if the party in a weak position could take consistent action, it could effectively inhibit the right of strong party. Therefore, it is suggested enhancing two parties' relationships via acquaintance contact, trust, mutual understanding, and farmer organization degree, thereby enhancing farmer's right and promoting channel stability.

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