Research on Evolution and Innovation of the Farm Product Marketing Channel Based on Regression Equation Model

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Abstract

Continuous improvement of the circulation system of modern agriculture has facilitated dramatic changes in China’s farm product marketing channel (“FPMC”). Improving FPMC can effectively promote development of the farmers’ markets, thus utilizing advantages of agriculture resources. FPMC, as an important path to transfer the farm products from farmers to consumers, exercises a great influence on every participant in the industrial chain of farm products, and plays a critical role in promoting the development of agriculture. Research on evolution and innovation of FPMC can help relieve the contradiction between a large market and small-scale production of farm products, and encourage farmers to actively use modern marketing system of farm products. Then, based on regression equation model, the paper further analyzes the evolution and change rules of FPMC, with a view to help more farm product enterprises better understand the farmers’ markets and greatly increase the income of farmers.

Keywords: Farm Products, Marketing Channel, Regression Equation Model, Evolution.

1. RESEARCH BACKGROUND

1.1 Literature review

The key to realizing agricultural modernization in China is to promote development of agricultural production, with the priority given to marketing of farm products. Faced with increasingly fierce competition on Chinese and foreign markets of farm products, China needs to rapidly enhance the marketing of farm products and innovate the farm product marketing channel (“FPMC”) (Du and Long, 2012). FPMC is closely related to the realization of product value, and thus has a direct bearing on interests of farmers. With “Internet +” as the driving force and entry point, the reform and innovation of FPMC can dramatically promote rural construction and agricultural modernization (Wu and Guo, 2017).

Marketing channels have played a crucial role in value realization of farm products, namely, the sale of farm products. To adapt to continuous development of China’s economy and society, FPMC should gradually be featured by “flat- and centralized-structure, strong control and high efficiency”, thus establishing a close relationship among all participants. Moreover, a future trend of the farmers’ market is to establish the model of “producer-processing and distribution center-chain stores of farm products-consumers” (Chen and Ran, 2007). However, since implementation of the industrialization pattern in the countryside, many highly- adaptable FPMCs have been formed, which has enhanced the marketability of farm products (Cao and Li, 2010).

1.2 Research purpose

In FPMC system, FPMC organizations refer to the groups that provide products and services for customers by performing marketing functions and that benefit from the process (Sun and Li, 2003). For example, in the entire farm product structure of Anhui Province, special FPMC has played a leading role. Development of distinctive farm products helps build a local farm product brand and increase the income of local farmers (Wang and Lei, 2012). As an important element of people’s daily life, farm products are closely linked with the income of the producers and sellers. Performance of marketing channels is directly related to development of the agricultural industry and economic interests of FPMC participants. In the FPMC, retailers exert a great influence on the pricing of farm products, and can effectively promote healthy operation of the farm product industrial chain (Cao and Liu, 2014). However, some problems with FPMC have hindered upgrading and transformation of the agricultural industry, and in turn the prosperity and development of the farmers’ market, such as low brand publicity, and lack...
of e-commerce channels (Li and Shen, 2017). Worse still, FPMC conflicts have also adversely affected the efficiency of such channels. Therefore, solving the conflicts of FPMC has become a key step in addressing problems with the sale of farm products (Du and Zhao, 2013). In view of the situation, the paper, after reviewing the literature at home and abroad, analyzes the research theory of FPMC, explains the content and category of FPMC evolution, and researches the evolution and innovation of FPMC from the perspectives of channel relationship, channel performance, etc., so as to provide a reference for addressing FPMC conflicts and reforming FPMC.

2. CONTENT OF FPMC EVOLUTION

FPMC refers to the multidimensional aggregate of exchange relations established during the process that ranges from distribution of farm products or food to purchase by consumers, and includes the marketing organization, marketing path, marketing process and so on. The farm products studied in this paper are mainly fresh farm products, including aquatic products, meat and eggs, vegetables, fruits and so on. The evolution of FPMC mainly involves five levels, namely, channel governance, channel relationship, channel function, channel organization and channel structure (Yu and Wang, 2007). To get a deep understanding on the evolution of marketing channels, explanations will be made from the angle of evolution content and category of FPMC. On the one hand, in terms of time, the content embodied in evolution of FPMC is divided into marketing channel reform and marketing channel evolution (as is shown in Table 1). Among the others, in some stages of FPMC, non-essential changes are referred to as marketing channel evolution, while essential changes are called marketing channel reform (Yang et al., 2017). Both FPMC reform and evolution are forms of change, and generally indicate positive progress.

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On the other hand, the evolution category of FPMC also starts with the reform and evolution of marketing channels (as is shown in Figure 1), and focuses on binary relationship of participants in the channel and system parameters of the channel chain. In evolutionary economics, evolution refers to cumulative changes in the structure of an individual group in a community, and is mainly featured by cyclic existence, diversified organization and accumulation. Besides, evolution includes 3 stages, namely, diversity, choice and survival. Among the others, diversified creation will determine the form of the organization, and scramble for scarce resources in the environment (Li and Li, 2006). The survival and maintenance of one organizational form is the choice of survival. Evolution of FPMC refers to changes in some elements of the channel, including the binary relationship of participants, and system parameters of the channel chain. However, marketing channel reform is caused by changes in environmental elements, such as the economy, society and technology. It has a reform point, namely, the time point a historical event occurs.

![Figure 1. Scope of FPMC Evolution](image-url)
3. FPMC PERFORMANCE RELATIONSHIP ANALYSIS AND RESEARCH HYPOTHESES

To conduct an in-depth research on FPMC, the paper starts with the performance relationship and analyzes the evolution rules and influencing mechanism of FPMC. When the marketing channel is regarded as a whole, the channel chain consists of three links: the supplier, the seller, and the buyer (Wang and Li, 2008), of which, the supplier and the seller play a crucial role (also referred to as the wholesaler and the retailer respectively). Their performance is mainly measured through financial performance assessment, which involves 5 indexes, namely, return on assets, sales profit ratio, cost profit ratio, total assets turnover, and current asset turnover.

Market sales performance has decided the way of channel cooperation, which is mainly realized by achieving a balance between transaction cost and profit. Research shows that when retailers have cost advantage, the profits of producers and wholesalers will be increased rather than be decreased. Besides, with increase in market share of the retailers, the channel efficiency will also be improved. Moreover, in the channel chain, there is the effect of interest relevance and asset sharing, so the economic performance of the wholesalers and retailers will have mutual influence. The following hypotheses are thus put forward:

H1a: Increase in financial performance of wholesalers will improve the retailers’ financial performance.

H1b: Increase in financial performance of retailers will improve the wholesalers’ financial performance.

As a rule, product distribution strategy allows consumers to access products or services they need at any time and place. During the sale of products, if retailers increase the distribution density, it indicates that retailers are willing to keep a large inventory and train many salespeople to maintain stable channel cooperation expected by the wholesalers (He et al., 2011). Therefore, the following research hypotheses are proposed:

H2a: With greater distribution density of wholesalers, wholesalers will have lower financial performance (H2a-) but retailers have higher financial performance (H2a+).

H2b: With greater distribution density of retailers, retailers will have lower financial performance (H2b-) but wholesalers have higher financial performance (H2b+).

The performance of channel participants will vary with concentration changes in different links of the marketing channel (Xiong and Wu, 2014). The so-called channel concentration refers to the ratio of product sales amount of wholesalers and retailers to the total sales amount of the industry within the limits of the wholesale and retail business. The following research hypotheses are proposed:

H3a: When channel concentration increases, the wholesalers’ financial performance will drop.

H3b: When channel concentration increases, the wholesalers’ financial performance will rise.

Considering it is impossible to understand the price difference between wholesalers and retailers, the paper adopts approximation of the total data and makes the following hypotheses:

H4a: The greater the channel price difference, the better the financial performance of wholesalers.

H4b: The greater the channel price difference, the better the financial performance of retailers.

According to the Theory of “Structure-Behavior-Performance” and transaction cost economics, close attention has been paid to analyze variables of the channel structure and channel behavior, so as to establish the interaction analysis model of wholesalers and retailers, as is shown in Figure 2.
Distributor distribution density
Retailer distribution density
Channel price
Channel concentration
Wholesaler performance
Retailer performance

Figure 2. Interaction Analysis Model of Wholesalers and Retailers

4. MODEL BUILDING AND ANALYSIS

4.1 Model settings and variable selection

Based on the above theories and research hypotheses, the distribution density is defined as $D$, and concentration as $C$ to build the performance model of wholesalers and retailers:

$$P_{w-it} = \alpha_0 + \alpha_1 P_{r-it} + \alpha_2 D_{w-it} + \alpha_3 D_{r-it} + \alpha_4 \hat{P}_{d-it} + \alpha_5 C_{it} + \mu_{it}$$  \hspace{1cm} (1)

$$P_{r-it} = \beta_0 + \beta_1 P_{w-it} + \beta_2 D_{w-it} + \beta_3 D_{r-it} + \beta_4 \hat{P}_{d-it} + \beta_5 C_{it} + \mu_{it}$$  \hspace{1cm} (2)

4.2 Data sources

The analytical data mentioned in the paper is taken from the China Trade and External Economic Statistical Yearbook, China Statistical Yearbook on Domestic Market, Trade and External Economic Statistics of China, and Market Statistical Yearbook of China. When building an econometric model, attention is only paid to wholesaler and retailer data generated from 2011 to 2015 in 31 Chinese provinces because of different statistical dimensions and methodologies.

4.3 Test of goodness-for-fit

In this paper, SPSS22.0 was employed to test the goodness-for-fit of the model. The following results are worked out: the model of wholesaler sales profit ratio $R^2=0.89$; model of wholesaler 100-yuan cost profit ratio $R^2=0.91$; model of retailer return on assets $R^2=0.83$; model of retailer sales profit ratio $R^2=0.88$, and model of retailer 100-yuan cost profit ratio $R^2=0.91$. The regression goodness-for-fit of wholesaler and retailer turnover is low, which makes it difficult to reflect the variable relationship at the confidence level.

4.4 Regression equation

Through the above-mentioned measurement effect and goodness-for-fit test, it is possible to figure out the regression equation of the wholesaler models and the retailer models. As the regression goodness-for-fit of turnover model is rather low, the paper only discusses the regression of the profit model on various influencing variables, including models of wholesaler sales profit ratio and wholesaler 100-yuan cost profit ratio, and the models of retailer return on assets, retailer sales profit ratio, and retailer 100-yuan cost profit ratio. The regression equations are as follows:

$$P_{w-sale}=0.2231-0.1387D_{w-dtype}+0.0035D_{r-dtype}-0.086C_{contr}+0.0023\hat{P}_{diff}+\mu_{it}$$  \hspace{1cm} (3)

$$P_{w-rev}=30.1201-22.7365D_{w-dtype}+0.4303D_{r-dtype}-11.9106C_{contr}+0.3523\hat{P}_{diff}+\mu_{it}$$  \hspace{1cm} (4)
First, the impact of FPMC density on the performance of wholesalers and retailers is consistent with Hypotheses H2a+ and H2a. Among the others, based on the regression coefficient -22.73 of the wholesaler 100-yuan cost profit ratio model, it is found that the greater the distribution density of wholesalers, the lower profit ratio of the wholesalers and the greater influence on 100-yuan cost profit ratio; based on the regression coefficient 32.81 of the retailer 100-yuan cost profit ratio model, it is found that the greater the distribution density of wholesalers, the higher profit ratio of the retailers and the greater influence on 100-yuan cost profit ratio. However, the distribution density of retailers has little influence on the profit ratio of retailers and wholesalers. This means that Hypotheses H2b+ and H2b- are not been validated.

Second, the impact of FPMC concentration on the performance of wholesalers and retailers is consistent with Hypotheses H3a and H3b. Among the others, based on the regression coefficient -0.086 and -11.91 of the wholesaler sales profit ratio model and wholesaler 100-yuan cost profit ratio model, it is found that the higher the concentration of FPMC, the lower the profit ratio of wholesalers; based on the regression coefficient 0.41, 0.12 and 23.93 of the retailer return on assets model, retailer sales profit ratio model and retailer 100-yuan cost profit ratio model, it is found that the higher the concentration of FPMC, the higher the profit ratio of retailers.

Third, the impact of FPMC prices on the performance of wholesalers and retailers is consistent with Hypotheses H4a and H4b. The channel price difference exerts a significant impact on the profit ratio of wholesalers and retailers, which indicates that the greater the price difference of FPMC, the higher the profit ratio of wholesalers and retailers.

Based on the above findings, it can be concluded that in FPMC, wholesalers and retailers have formed a win-win profit distribution relationship. From the perspective of internal mechanism, due to the influence of distribution density, channel concentration, and interaction of wholesale and retail performance, interactions of channel participants and the channel structure have been influenced. Therefore, efforts shall be made to strengthen coordination and cooperation inside the FPMC, with a view to actively promote development of production and sales organizations in FPMC. For example, efforts can be made to energetically develop contract farming and direct purchasing by farm produce supermarkets, improve supply safety of farm products, and in turn realize traceability of farm products.

5. CONCLUSION

With development of farmers’ market, market consumption has shown the trend of heterogeneous development, which has resulted in reform and innovation of the food product chain. On the one hand, economic globalization has led to personalized food preferences, thus increasing differentiated demand among consumers for product quality, category and price. Namely, consumers hope to buy farm products of different qualities and grades at any time in the supermarkets, on the wholesale markets or on the farmers’ markets, etc. On the other hand, innovation of FPMC has promoted the reform and development of many enterprises, with an aim to meet the requirements for quality, safety, efficiency and spatial convenience of farm product supply. Moreover, evolution of FPMC has also spawned new forms of collaboration and competition, such as contract farming, farmer cooperatives, etc. Therefore, it is of great theoretical and practical significance to research and analyze the reform and innovation of FPMC.

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