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Development of a New Direct Marketing Channel in the Chinese Rural Market: The Case of Hongfu Fertilizer Company

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Distribution channel decisions involve long-term commitments with other firms that are very difficult to change or replace. In particular, marketing channel decisions in emerging markets are much more complicated due to unfamiliar conditions and problems such as lack of market data and distribution systems. Therefore, when a company considers changing or introducing a marketing channel in an area, it is much more difficult to judge its effectiveness in an emerging market than in a developed market.

In this study, we investigate the development process of a new direct marketing channel of Hongfu Fertilizer Company (hereafter Hongfu), a medium-sized Chinese fertilizer manufacturer, and propose an approach to test the feasibility of this new marketing channel in the Chinese rural market. We measure the effectiveness of Hongfu's new marketing channel from two perspectives: i) from customers' perspective through direct responses of farmers, which showed that a new channel can increase the convenience and lower the purchasing costs for the farmers, and ii) from the company's perspective, by calculating the incremental profit of the company using the expansion factor (T/Q) method, which suggested that the execution of Hongfu's strategy to expand a new marketing channel will result in an increase in profits.

The results of this study contribute to the development of a methodology to test the feasibility of a new direct marketing channel in the emerging markets such as the Chinese rural market. Traditional and indirect distribution channels in emerging markets are generally not very efficient and difficult to change. Especially, in emerging markets, like the Chinese rural market, the methods of testing channel feasibility must be different from that of developed markets. Considering market situations, market experiments can be more effective then systematic market surveys in testing channel feasibility in emerging markets.

This study implies that managers must learn to cope with a transition from the traditional marketing channels in emerging markets. With the development in farmers' understanding of marketing concept,

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the transition from traditional marketing channel is unavoidable for all firms. Farmers in China are generally very conservative, however, their buying behaviors are changing. Therefore, fertilizer companies should try to adjust in accordance with farmers' demand characteristics that the efforts to meet the economic needs of farmers with new marketing channels as well as trust building are critical in the near future.

Key words: Marketing Channel, Direct Channel, Expansion Factor, Chinese rural market, Fertilizer, Hongfu

I. Introduction

Distribution channel decisions involve long-term commitments with other firms that are very difficult to change or replace (Kotler and Armstrong 2012). The growing number of marketing channels that are available to customers has made it imperative for managers to understand the customers' decision process behind choosing the appropriate channels. However, firms' knowledge of channel decision process is still limited (Wallace, Giese, and Johnson 2004; Valentini, Montaguti, and Neslin 2010).

In particular, marketing channel decisions in emerging markets are much more complicated because of the range of unfamiliar conditions and problems in these markets. The emerging markets even lack the basic marketing infrastructure, including market data and distribution systems, which is easily available in most developed countries (Arnold and Quelch 1998; Stanton 2012). Therefore, when a company considers changing or introducing a marketing channel in an area, it is much more difficult to judge its effectiveness in an emerging market than in a developed market. Thus, companies in emerging markets generally test the feasibility of a channel by testing it on a small scale and then extrapolate the obtained results to the entire market for execution (Arnold and Quelch 1998; Sheth 2011).

In this study, we examine the Chinese fertilizer market to suggest a methodology for testing the feasibility of a new marketing channel and specifically focus on Hongfu, a medium-sized Chinese fertilizer manufacturer, to investigate the new marketing channel development process. The Chinese fertilizer market is quite huge and unpredictable, which makes it difficult for a company to accurately estimate the risks and effects of their distribution channel decisions. Fertilizer customers include more than 0.8 billion farmers that are widely distributed over 9.60 million km^2 area of China. However, Chinese fertilizer companies still follow traditional marketing channels, for example, those that follow the path: "manufacturers → mid-

dlemen → retailers → farmers." Zhang and Chen (2007) summarize that there are three types of traditional marketing channels for the distribution of agricultural production goods: i) supply stores in the countryside, ii) service centers of local agricultural bureau, and iii) individual businesses. However, these existing traditional channels have some drawbacks such as i) high selling costs, ii) decrease in the control force and competitive power of manufacturers, iii) increase in the marketing channel conflicts, and iv) limited after-sales service (Zhang and Chen 2007; Li, He, and Shen 2010).

Since most channel members recognize these limitations of the traditional fertilizer distribution channels, a number of researchers and managers have attempted to develop a new direct marketing channel. Ju and Wang (2006) propose a new online mode for group purchases, called "initiative group-buying mode," in which retailers operate as organizers to initiate and manage group-buying transactions. They believe that initiative group-buying can be beneficial to every channel members during the transaction, because group-buying can increase retailer and manufacturer's sales volume, and decrease consumer's purchase cost. In contrast, Wang and Dong (2004) indicate the difficulties of introducing a new marketing channel. They argue that characteristically, the Chinese rural market lacks market information, has an imperfect circulation system, and provides delayed after-sales service, which makes it difficult to organize the farmers for group purchases. Further, Li, He, and Shen (2010) suggest that a local agricultural cooperation organization should be established to facilitate the collaboration of farmers with agricultural production goods manufacturers. However, they fail to clarify who will build and manage this agricultural cooperation organization. If the local government controls, the organization may become politicized, and if the individuals or companies are involved, the result will be the same as that of the initiative group-buying mode. Thus, the limitations of traditional channels are recognized, but the development and implementation of a new effective direct marketing channel is still under discussion.

Although it is very difficult to restructure the existing fertilizer distribution channels in the Chinese rural market, it is certain that traditional channels should be changed for the benefit of both manufacturers and farmers. Therefore, fertilizer companies are attempting to gradually introduce a new channel structure in the Chinese rural market.

In this study, we analyze the effectiveness of a new direct channel of Hongfu. Moreover, we propose an approach to test the feasibility of this new marketing channel adopted by Hongfu. Hongfu is trying to analyze whether the new approach of direct marketing that is tested at several places in China can be spread to the entire country. We measure the effectiveness of Hongfu's new marketing channel from two perspectives. First, from customers' perspective,

we study the direct response of the farmers to the new channel. Second, from the company's perspective, we estimate the incremental profit of the company if the strategy is expanded to the entire market, based on the expansion factor (T/Q) method.

Ⅱ. Literature Review: Direct Marketing Channel

The concept of direct marketing channel is closely related to direct marketing. Direct Marketing Association (DMA, www.thedma.org) defines direct marketing as "…communications where data are used systematically to achieve quantifiable marketing objectives and where direct contact is made, or invited, between a company and its customers and prospective customers." Mullin (2002) defines direct marketing as "the delivery of a marketing message or proposition to a target customer or potential customer, in a customer favorable format, put to the customer from the seller or the seller's agents (including call centers) without an intermediary person or indirect media." This implies that the outcome of direct channel building is same as that of direct marketing.

Direct marketing has been studied extensively over the decades (Frazier 1983; Mohr and Nevin 1990; Chiang, Chhajed, and Hess 2003; Xu, Liu, and Zhang 2012). Most studies support the advantages of transactions through direct marketing. Especially, advances in information technology have dramatically changed the way firms design their marketing channels (Wallace, Giese, and Johnson 2004). The literature shows that integrated channels (i.e., direct channels) appear to be facilitated to the consummate transactions (Anderson 1985; Anderson and Coughlan 1987; John and Weitz 1988; Klein, Frazier, and Roth 1990). Meanwhile, some researchers also suggest that the volatility in firms' output environment contributes to greater channel integration (Dwyer, and Welsh 1985; John and Weitz 1988; Klein, Frazier, and Roth 1990). Furthermore, the scale economies paradigm, that is, the higher the sales volume of a product line or business, the more firms rely on integrated channels, has also received support from researchers (Lilien 1979; Klein, Frazier, and Roth 1990).

In addition, many studies focus on the reform of direct channels for firms to enhance the force of market control. In one approach, some manufactures add a direct channel to their traditional retail channels (Geyskens, Gielens, and Dekimpe 2002; Chiang, Chhajed, and Hess 2003; Tsay, and Agrawal 2004; Xu, Liu, and Zhang 2012). As a result, customers can use either the retail or direct channel for making purchases, and thus, manufacturers can avoid the risk of indirect channels caused by intermediaries. Dutta, Heide, and John (1995) find in their empirical study that a supplementary direct

channel can improve the manufacturer's ability to manage the indirect channel better. Kogan (2012) also discovers that the manufacturer-owned direct channel generates more revenue and may reduce the volatility of both the inventory and production orders.

Although these studies mainly focus on the significance of the relationship between direct channels and profits. The realization of direct channels in complicated, uncertain environments, such as that in Chinese rural areas, has not been addressed in the literature adequately. In their literature review, Bose and Chen (2009) conclude that direct marketers observe the responses of customers (i.e., buy or not buy) to adjust their strategy and execute new direct marketing activities such as i) collection of customer data, ii) selection of target customers, iii) customer profiling, iv) direct marketing strategy planning, and v) performance evaluation. However, their findings on direct marketing are neither empirically tested nor adapted to the characteristics of the Chinese rural market.

Ⅲ. Hongfu's Case: Initial Trial to Change the Marketing Channel and Its Responses

3.1 About Hongfu

In this study, we show the process of introducing a new marketing channel in the Chinese rural market. We selected the Hongfu because this company poses a new challenge to the traditional marketing channel and thus offers an interesting case.

Hongfu is a medium-sized phosphate fertilizer supplier of the Chinese rural market. It is relatively new compared to the hundreds of fertilizer manufacturers in China. The annual output of Hongfu fertilizers was more than 3.5 million tons in 2012. Since its establishment in 2001, the company has followed the traditional channel model to sell its fertilizers, similar to other fertilizer manufacturers.

However, Hongfu recently initiated a new trial to change its marketing channel. The new channel, called Hongfu Village, differs from the traditional distribution channel, as it approaches the customers directly. It is noteworthy that an ordinary medium-sized fertilizer manufacturer has attempted to initiate an innovate trial in the traditional Chinese rural market. Other fertilizer companies are also examining Hongfu's market experiments for benchmarking purposes. Hongfu is testing the feasibility of the new marketing channel by introducing the change to a random selection of 85 villages in China. If the small-scale experiment on 85 villages proves successful, the company plans to expand the marketing channel to the entire country. Therefore, we investigate the case of Hongfu and analyze its process of launching a new direct marketing channel to estimate the effectiveness of this

initial attempt to change the marketing channel.

3.2 The Initial Trial of Hongfu

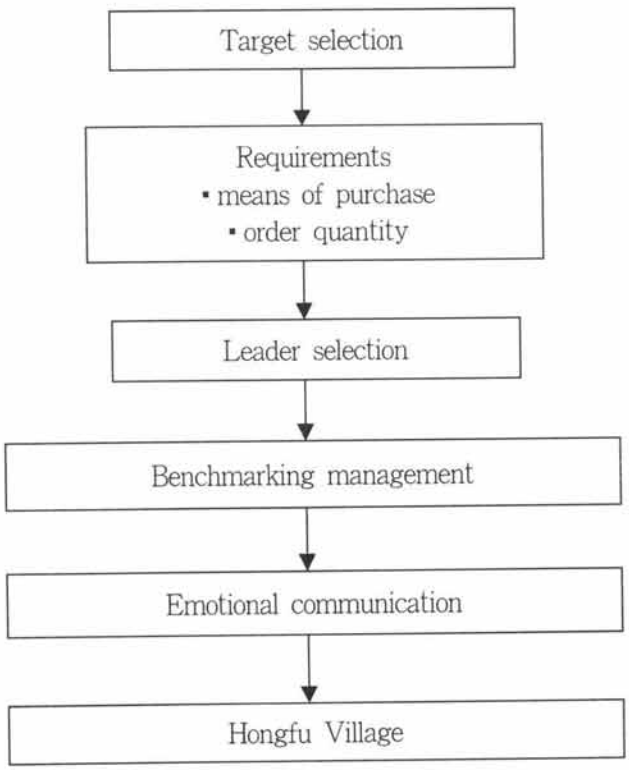
The Hongfu Village is a direct channel between the manufacturer and farmers and does not involve middlemen and retailers. Precisely, the channel consists of seven components to successfully accomplish direct sales (See Figure 1).

1) Target selection: The company selects several administrative villages from its target market. The farmers of the selected villages are required to be customers of Hongfu's phosphate fertilizer for at least three continuous years and should be highly satisfied with the products. The company will sign a contract with the head of the village that meets this requirement to construct a Hongfu Village as a direct sales channel for Hongfu products.

2) Purchasing approach: The farmers must collectively place the purchasing order as well as collectively make the payment to the company through the village head. After that, Hongfu will distribute the fertilizer to the village directly. In this case, the Hongfu Village should order in advance (Hongfu adopts order management model to minimize its inventory control cost) and the purchasing price is much lower than that of the same products sold otherwise.

3) Order quantity: The order quantity of Hongfu's phosphate fertilizer should be more

〈Figure 1〉 Process of Building a New Direct Marketing Channel



than 70% of the total fertilizer purchase made by the village annually.

4) Organizational management: The village head is in charge of the business between the company and the villagers and serves as the mediator between them.

5) Demonstration effect: In every selected village, the company chooses two to three typical peasant households as models to teach the techniques of planting and fertilizing to the farmers, and thereby, influences the consumers around the models.

6) Emotional communication: In order to develop better *guanxi* (social connections or relationship) with the farmers, the company invests in technique training, after-sales service, and cultural activities to improve brand awareness and reputation.

7) Placement of Hongfu's signboard: If the village meets the above requirements, the company would hang up Hongfu's signboard in the village as a symbol of its direct marketing.

3.3 Direct Effects of New Channel Development

In 2011, Hongfu built 85 Hongfu Villages in several provinces of China. According to Hongfu company data, although these Hongfu Villages constitute only 1% of the company's 8000 commercial networks, their sales volume is more than 6% of the company's total annual sales. Moreover, the change in channel results in more profits for farmers. Collective purchasing and low logistics costs enable the company to deliver the products to farmers directly at lower prices. According to the present prices of fertilizer and logistics, the change in channel can result in a total reduction of about 40 RMB per ton in fertilizer costs for customers. The most significant contribution of the channel change is the increase in farmers' output. The differ-

〈Table 1〉 Comparison of Output Before and After Channel Building

Crops	Before Channel Building						After Channel Building					
	UF	DP	PF	Cost	Output		UF	DP	PF	Cost	Output	
	Kg/Unit			RMB/Unit	Kg/Unit	RMB/Unit	Kg/Unit			RMB/Unit	Kg/Unit	RMB/Unit
soybean	11	15	8	77.65	146	411.72	8	12	5	57.55	150	423
rice	30	10	8	101.7	502	793.16	25	8	6	82.45	511	807.38
corn	30	12	9	109.05	446	535.2	25	10	8	91.95	480	576
wheat	25	15	10	109.25	425	641.75	20	10	7	80.05	451	681.01
cotton	25	15	15	120	90	127.8	20	11	12	93.4	105	149.1
Average	24	10	6	103.53	322	501.93	20	6	8	81.08	339	527.3

Note 1): UF denotes urea fertilizer, DP denotes diammonium phosphate, and PF denotes potash fertilizer.
2): Unit denotes one unit of area.
3): The cost is based on the prices in 2012.
4): The output is based on the data of 85 selected Hongfu villages.

ence in output can be calculated by comparing the output before and after channel building (see Table 1).

To calculate the experimental result of channel building, we use the method of single factor (univariate) analysis, which is the way to examine how one factor influences the experimental result before and after considering this factor in an examination (Nelson, and Ellenberg 1985), as indicated in formula (1).

$$E_m = (Q_1 - Q_0) \times r - (\sum_{a=1}^{n} C_a + I) - F \qquad (1)$$

Here :

E_m: Average incremental yield from a unit of area.

Q_0 : The annual yield from a unit of area before channel building.

Q_1 : The annual yield from a unit of area after channel building.

r : The coefficient of transforming Q to an annual measurable value: r is the price of grains.

C_a : The incremental cost invested by farmers (e.g., time, watering, and agricultural machinery service), excluding the cost for crop fertilizer, before and after channel building.

I : Loss: I is 0 as there is no unexpected loss, e.g., due to a flood disaster.

F : The incremental profit is derived from means other than fertilizers before and after channel building. Several factors influence crop output, such as watering, weather, and agricultural machinery. Through a survey, we find that there is no incremental output because all other factors (watering, weather, and agricultural machinery) remained the same before and after channel building.

We investigate the machine cost and the wage of one labor employed by farmer before and after channel building for one unit of area, and find that the incremental labor cost is 15 RMB while the incremental average machinery cost is close to zero for one unit of area, depending on the price of watering and agricultural machinery service before and after channel building.

Thus, according to the data, we can calculate the E_m as follows.

$$\begin{aligned} E_m &= (Q_1 - Q_0) \times r - (\sum_{a=1}^{n} C_a + I) - F \\ &= 29.002 - 15 \\ &= 14.002 \text{ (RMB/unit)} \end{aligned}$$

Similarly, we derive the incremental output resulting from lowered fertilizer prices, which is 25.116 RMB for one unit of area. Thus, we can see that the farmers can get an incremental output (obtained by comparing the outputs before and after channel building) of 39.118 RMB from one unit of area directly based on the channel change.

Ⅳ. Estimation of the Entire Market Effects

Hongfu developed 85 direct marketing channels in its initial trial. However, we need to determine the incremental returns that the com-

pany will receive, if the company's channel development strategy covers the entire target market. The estimation of incremental returns will confirm whether the channel strategy should be expanded in the future.

4.1 Method

Srinivasan, Park, and Chang (2005) propose a new approach for measuring, analyzing, and predicting a brand's equity with a focus on the incremental choice probability based on logit and self-explicated conjoint. They propose that multiplying the sum of the incremental choice probabilities of customers (or a segment of customers) with the corresponding category-level purchase quantities and a brand's contribution margin can yield an output measure of brand equity in financial terms.

Here, we use this calculation to test the output of direct channel returns as indicated in formula (2).

$$R_i = q_i \Delta p_i r \qquad (2)$$

Here,

R_i : Hongfu's incremental returns per year from respondent i's purchases.

q_i : respondent i's total purchasing quantity (units/year) of Hongfu products.

Δp_i : respondent i's incremental purchasing choice probability of Hongfu products.

Thus, $\Delta p_i = (p_i^{\gamma} - p_i)$. P_i^{γ} is the purchasing choice probability in the previous year, and p_i is the purchasing choice probability in the future.

r : contribution margin from Hongfu products (=unit price-unit variable cost).

R_i is the company's returns from an individual customer; it is transformed to an aggregate level by using a multiple linear regression equation, as indicated in formula (3):

$$R = \left(\frac{T}{Q}\right) r \sum_{i=1}^{n} q_i \Delta p_i \qquad (3)$$

T denotes the total product quantity of Hongfu products per year for the entire market;

Q means the total quantity of Hongfu products per year summed over the sample.

Path : "scales up" the sample of respondents to the population level according to T/Q.

Therefore, the most critical step of this analysis is the estimation of the value of Δp_i, because the other variables can be derived easily through a questionnaire survey and from Hongfu's transaction records.

In this study, we try to test the feasibility of the change in channel from two perspectives (the company and customers) and compare the results to ensure the effectiveness of the new channel. Levin and Zahavi (1998) and Van der Sheer (1998) use logit models to estimate customer response and linear regression models to estimate monetary value. Following their methodology, we use logit and linear regression models to get Δp_i for the farmers' incremental choice probability and to estimate the incremental monetary value of the new

channel.

We can obtain the individual future choice probability for Hongfu fertilizers by using the following logit model. Considering the customers' brand preference (u_i) for Hongfu products, p_i can be described using formula (4).

$$p_i = \begin{cases} \dfrac{exp(\alpha u_i)}{\sum_{k \in V_j} exp(au_k)} & if \ \ i \in V_j \\ 0 & if \ \ i \notin V_j \end{cases} \qquad (4)$$

V_j = a set of respondent i's preference for fertilizers of a different brand: we define it as the brands that the respondents will buy in the next year.

u_i = respondent i's preference for Hongfu products: we define it as the ratio of the quantity of Hongfu brand to that of different brands bought by the respondents.

u_k = respondent i's preference for various brands.

We can estimate the parameter α in formula (4) by maximizing the following likelihood function:

$$L(p_i) = \Pi_{i=1}^{n} (p_i)^{\delta_i} (1-p_i)^{(1-\delta_i)} \qquad (5)$$

So, $\ln L(p_i) = [\ln (p_i^{\delta_1}) + \cdots + \ln (p_i^{\delta_n})]$

$$+ [\ln (1-p_i)^{(1-\delta_1)} + \cdots]$$

Let $\dfrac{dlnL(p_i)}{dp_i} = 0,$

So, $\dfrac{\sum_{i=1}^{n} \delta_i}{p_i} - \dfrac{n - \sum_{i=1}^{n} \delta_1}{1-p_i} = 0$

Here δ_i equals 1 if respondent i last purchased Hongfu fertilizer and equals 0 otherwise.

Thus, we can get the Maximizing Likelihood Estimation Value $\hat{p}$ as formula (6).

$$\hat{p} = \frac{1}{n} \sum_{i=1}^{n} \delta_i \qquad (6)$$

According to the Binomial Logit Model:

$$P_H = \frac{1}{1 + e^{-\alpha u_H}} \qquad (7)$$

Here, u_H means brand preference for Hongfu Products, which we define as the market share ratio.

Then, let $p_H = \hat{p}$, we can obtain parameter α.

Here, u_i, u_H and δ_i will be investigated using questionnaires and *IR* can be analyzed with the help of the obtained data.

4.2 Data

We procured the recent sales data from the company, including its margin from Hongfu products (r = unit price - unit variable cost), and the total product volume per year for the entire market, including new and traditional channels (T). According to Hongfu's annual financial report of 2011, its business volume (T) is 7.7 billion (the sales volume is 3.5 million tons, the mean factory price is 2200 RMB/ton, and the cost per ton is 2000 RMB: thus, r = 200 RMB/ton and r = 0.2 RMB/kg).

We also collected data through a questionnaire survey. As the first step, we selected the sample population that consists of farmers who must buy fertilizer products every year and live in the Hongfu's new target markets such as Shandong, Anhui, Henan, Hebei, Shanxi, Hubei, Zhejiang, Yunnan and Tianjin. Next, we selected 200 university students from different regions of China who are currently residing in Shandong province and whose parents or neighbors are eligible (famers in the target areas) mentioned above. We then administered the questionnaire to these students during September—October, 2012, and asked them to obtain the answers from their parents or neighbors to collect the responses of 200 different farmers. Out of the 200 questionnaires that were received, we excluded 16 invalid questionnaires and used the remaining 184 effective questionnaires for our analysis. All the respondents are farmers and buy fertilizer products every year. Each respondent comes from a different family, consisting of three to four persons (detailed characteristics of respondents can be seen in Table 2). Although the population of Chinese farmers is huge, we expect that the demand characteristics of farmers are similar and the sample size of 200 respondents

〈Table 2〉 Descriptive Statistics of Respondent Characteristics

Characteristics	Item	Count	%
Gender of respondent	Male	108	58.7
	Female	76	41.3
Age of respondent	〉60	47	25.5
	60-45	121	65.8
	45-30	16	8.7
Education level of respondent	Elementary school	66	35.9
	High school	118	64.1
	College	0	0.0
Annual income of a family	〈10,000RMB	0	0.0
	10,000-20,000	17	9.2
	20,000-30,000	63	34.2
	30,000-40,000	78	42.4
	〉40,000RMB	26	14.1
Years buying fertilizer products	〈1 year	0	0.0
	1-5 years	3	1.6
	5-10 years	90	48.9
	〉10 years	91	49.5
Distribution of respondent	East China	98	53.3
	Midwest China	86	46.7

used in the survey is sufficient to adequately explain the issue. In the survey administered to the farmers, we asked questions such as whether they have previously purchased Hongfu products, their reason for buying or not buying Hongfu products, their quantity of purchase, competing brands, and purchase intention in the future.

The survey results provided us with the data on respondent i's total purchasing quantity (units/year) that he or she will buy after knowing the sales policy of Hongfu products (q_i), the total quantity per year summed over the samples (Q), the set of respondent i's preference for fertilizers of different brand (V_j), respondent i's preference for Hongfu products (u_i), and respondent i's preference for various brands (u_k). To determine parameter α, we also need to know the values of P_i^{γ}, p_i, u_i and u_k (for the estimation of u_k, please refer to Srinivasan, Park and Chang (2005), p.1438-1445): otherwise, we cannot obtain the value of Δp_i and achieve the target. To simplify the process of deriving the values of u_i and u_k, we assume that respondent i's brand preference is equal to the ratio of the quantity of target brand to the quantity of purchase desired by respondent i.

4.3 Analysis and Results

Among of the 184 effective respondents, only one had previously bought Hongfu fertilizers. When we showed the sales policy and benefits of buying Hongfu fertilizers to the respondents, 94 respondents (including the one respondent who had previously bought the product) answered that they would buy Hongfu fertilizer. The total quantity of demand forecast for Hongfu's products is 12.75 tons—which is 14.84% of the total quantity of fertilizer demand forecast. Therefore, the purchasing preference for Hongfu's products is 0.1484.

According to formula (6), we find that $\hat{p}$ =0.5187. Based on the definition of u_H, we use the Matlab software to calculate the α value using formula (7): α=0.5043 (Please see the Appendix for the program used for calculating α).

Then, we estimate the results of P_i^{γ} and p_i by evaluating the data obtained from the questionnaires of 94 respondents, who indicated a purchase intention for Hongfu's products and get the Δp_i as seen in Table 3.

As mentioned above, among the 94 respondents, only one respondent had previously purchased Hongfu fertilizer, and the other 93 had never purchased the product. Thus, P_{67}^{γ} and p_{67} all equal 1, and the other $p^{\gamma}{}_{1-66,68-94}$ all equal 0, and then we know that $\Delta p_i = p_i$ except for ΔP_{67} and P_{67}. Since we have derived the value of each parameter, we can now calculate the result of R according to formula (3).

In conclusion, T=3.5*10^9 kg, Q=12,750 kg,

〈Table 3〉 Δp_i and q_i Values

Δp_i	Value	q_i	Value	$q_i \Delta p_i$	Δp_i	Value	q_i	Value	$q_i \Delta p_i$	Δp_i	Value	q_i	Value	$q_i \Delta p_i$
p1	0.5000	q1	150	75	p32	0.1915	q32	200	38.3	p63	0.3042	q63	150	45.63
p2	0.5000	q2	100	50	p33	0.3248	q33	200	64.96	p64	0.5000	q64	100	50
p3	0.5000	q3	200	100	p34	0.4249	q34	50	21.245	p65	0.5000	q65	100	50
p4	0.4685	q4	150	70.275	p35	0.3142	q35	100	31.42	p66	0.5000	q66	50	25
p5	0.5000	q5	100	50	p36	0.4249	q36	50	21.245	p68	0.5000	q68	200	100
p6	0.4885	q6	250	122.125	p37	0.3133	q37	150	46.995	p69	0.2605	q69	200	52.1
p7	0.3190	q7	50	15.95	p38	1.0000	q38	100	100	p70	0.4685	q70	150	70.275
p8	0.4581	q8	50	22.905	p39	1.0000	q39	50	50	p71	0.4249	q71	100	42.49
p9	0.4497	q9	150	67.455	p40	1.0000	q40	50	50	p72	0.4462	q72	100	44.62
p10	0.2500	q10	50	12.5	p41	0.2500	q41	100	25	p73	0.3195	q73	100	31.95
p11	0.5000	q11	100	50	p42	0.3110	q42	100	31.1	p74	0.4581	q74	100	45.81
p12	0.2574	q12	250	64.35	p43	0.3080	q43	150	46.2	p75	0.4497	q75	150	67.455
p13	0.4373	q13	50	21.865	p44	0.4748	q44	100	47.48	p76	0.3042	q76	100	30.42
p14	0.3190	q14	50	15.95	p45	0.3142	q45	100	31.42	p77	0.4581	q77	50	22.905
p15	0.5419	q15	100	54.19	p46	0.3195	q46	200	63.9	p78	0.5000	q78	50	25
p16	0.3403	q16	150	51.045	p47	0.3290	q47	200	65.8	p79	0.5000	q79	50	25
p17	0.3522	q17	200	70.44	p48	0.3446	q48	300	103.38	p80	0.5000	q80	100	50
p18	0.3142	q18	100	31.42	p49	0.4373	q49	100	43.73	p81	0.4581	q81	50	22.905
p19	0.3394	q19	150	50.91	p50	0.4249	q50	150	63.735	p82	0.3333	q82	150	49.995
p20	0.3178	q20	100	31.78	p51	0.4373	q51	100	43.73	p83	0.4373	q83	100	43.73
p21	0.3241	q21	100	32.41	p52	0.4581	q52	200	91.62	p84	0.5000	q84	100	50
p22	0.3271	q22	150	49.065	p53	0.4249	q53	100	42.49	p85	0.5000	q85	150	75
p23	0.3271	q23	150	49.065	p54	0.3190	q54	100	31.9	p86	0.4685	q86	150	70.275
p24	0.3190	q24	50	15.95	p55	0.3149	q55	150	47.235	p87	0.4820	q87	150	72.3
p25	0.2395	q25	100	23.95	p56	0.3113	q56	100	31.13	p88	0.4748	q88	100	47.48
p26	0.3195	q26	100	31.95	p57	0.3148	q57	200	62.96	p89	0.4581	q89	100	45.81
p27	0.4373	q27	250	109.325	p58	0.4373	q58	100	43.73	p90	0.5000	q90	150	75
p28	0.3190	q28	50	15.95	p59	0.5000	q59	100	50	p91	0.4581	q91	250	114.525
p29	0.2461	q29	300	73.83	p60	0.4497	q60	150	67.455	p92	0.5315	q92	250	132.875
p30	0.2034	q30	400	81.36	p61	0.5000	q61	200	100	p93	0.3333	q93	100	33.33
p31	0.1966	q31	250	49.15	p62	0.4218	q62	150	63.27	p94	0.4685	q94	300	140.55

Note: q_i: Respondent i's purchasing quantity for different brands per year in the future.
$q_i \Delta p_i$: Respondent i's purchasing quantity of Hongfu fertilizer.

r=0.2 RMB/kg, and $\sum_{i=1}^{n} q_i \Delta p_i$=5234.025; thus, R=287,358,235.294 RMB. Therefore, we can see that if Hongfu expands the direct marketing channel strategy to the entire market, it will gain over 0.287 billion RMB at least in incremental revenue per year.

V. Conclusion and Discussion

When firms initiate a new strategy, they generally test it on a pilot scale before expanding it to the entire market. However, even if the results of the pilot test are favorable, managers still have to face uncertainty and tension with respect to the effectiveness of the new strategies in the entire market. In this study, we analyze the effectiveness of a new direct marketing channel and test the feasibility of expanding a new channel strategy to the entire market by calculating the company's incremental profit. We estimate it from two perspectives: i) from the customers' perspective: by evaluating the direct responses of farmers on the new channel, we find that it can result in greater convenience and lower purchasing costs for farmers, and ii) from the company's perspective: by calculating the incremental profit of Hongfu using the expansion factor (T/Q) method, we find that the new direct marketing channel strategy is beneficial for both Hongfu and its customers when expanded to entire market. The results of data analysis suggest that the execution of Hongfu's strategy to expand the new channel strategy will lead to an increase in its profits. Moreover, as the incremental profit is far greater than zero, in theory, the new strategy is feasible and can be expanded.

There are several managerial and theoretical implications of this study. First, this study sheds light on the methodology to test the feasibility of a new marketing channel in the Chinese rural market, which is important because most firms do not have a proper method of examining the effectiveness of their channel strategies before implementation. Using Hongfu's case as an example, we find a method to test the feasibility by expansion factor analysis. It further implicates that this methodology can be used to evaluate a marketing channel transformation in the Chinese rural market. The model constructed in this study to test the new marketing channel strategy can be used by the other companies, who can reinterpret the parameters of the model to estimate other marketing strategies, as these firms must face similar situations in emerging markets. Thus, the methodology in this study can be helpful to judge the effectiveness of channel strategy.

Second, for managers, this study contributes to the understanding of the feasibility of marketing channel change in the Chinese fertilizer market as an example of traditional marketing channel in an emerging market. Traditional and indirect distribution channels are generally not very efficient and difficult to change. The Chinese rural market is huge and underdeveloped, and its market environment is diverse and volatile. Therefore, it is very difficult for managers to make channel decisions, for example, changing the existing marketing channels or introducing a new channel. Moreover, there are

not enough feasible methods to help a company estimate the validity of spreading out its channel strategy. Especially, in emerging markets, like the Chinese rural market, the methods of testing channel feasibility must be different from that of developed markets. Considering market situations, market experiments can be more effective then systematic market surveys in testing channel feasibility in emerging markets.

Third, this study implies that managers must learn to cope with a transition from the traditional marketing channels in emerging markets. With the development in farmers' understanding of marketing, the transition from traditional marketing channel is unavoidable for all firms. Therefore, fertilizer companies should try to adjust in accordance with farmers' demand characteristics. That is, managers need to craft an effective strategy based on the market system of the consumer especially understanding the consumers' critical factor (Kim and Yuan, 2012). Farmers in China are generally very conservative (Li, He, and Shen, 2010). For example, we noticed a surprising result from the interview that some farmers would not prefer to buy cheaper and high quality fertilizer. They answer that company credit and the degree of public trust in village leader are the main factors of making purchase decision. Nonetheless, most farmers expect that companies' direct marketing channel can offer greater purchasing convenience and decrease their agricultural production costs. It implies that buying behaviors of conservative farmers are also changing. Therefore, in addition to building trust, the efforts to meet the economic needs of farmers with new marketing channels are critical in the near future.

Lastly, this study can be a meaningful building block for understanding emerging market. Prahalad (2006) argue that the world's most exciting, fastest-growing new market is at the bottom of the pyramid (BOP). The Chinese rural market is one of BOP market where the fastest growing new markets and entrepreneurial opportunities being found among the billions of poor people. The case of Hongfu in this study can provide some implications in managing marketing channel in this market.

There are some limitations to our exploratory research that should be addressed in future studies. First, there are a number of reasons that affect customers' purchase decisions. This study just focuses on one case and does not consider a number of factors that can influence purchase decisions. Even though a new channel strategy allows farmers to buy high-quality fertilizers at lower prices and helps them earn more profits, nearly half of the target customers did not prefer to buy fertilizers using this channel. We found some reasons for this lack of purchase intention through our interview, the prime among which were company credit and village leader's public trust. In this study, we could not focus on these factors that influence purchase decisions. The future studies should

consider additional factors, such as customers' purchasing cognition and intention, customers' mental/emotional perceptions, and other companies' strategies for a better understanding.

Second, we calculate the direct and entire market response based on survey method. However, this study is more of a case study than an empirical study. Therefore, the results should be generalized very cautiously. The limited sample size in comparison to the huge Chinese market and convenient sampling methods constrain the external validity of this study. More detailed survey with larger sample size or in a different setting could enhance the validity of this study. Moreover, in this study we pay more attention to the procedures of an approach to judge or estimate the marketing channel strategy. Finally, this study mainly focuses on the quantitative perspective of new channel development, however a complementary qualitative perspective will provide a better interpretation of the results of this study.

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〈Appendix〉

The process of calculating parameter with the Matlab software is as following.

1) >>eq1 =sym('1/(1+exp(-0.1484*α))-0.5187')

2) eq1 =1/(1+exp(-0.1484*α))-0.5187

3) >>s=solve(eq1, 'α')

4) s=.50427833590492469399172958282959.