CONSUMERS' PREFERENCE OF RICE BRANDS IN KOREA

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Keywords

Korean rice brands, conjoint analysis, virtual market share

Abstract

This paper conducts several analyses to discuss about consumers' preference of rice brands and suggest a way to reduce the number that currently stands at about 1,700 in the Korean market. With data collected from 358 survey respondents, a conjoint analysis was conducted to identify consumers' preferences of Korean rice in regard to such aspects as producing area, brand, category, and price. We particularly focused on analyzing the consumers' preference of rice brands, with some scenarios to decrease the number of brands. The paper also estimated the virtual market shares of rice brands. As results of the analyses, the paper shows that the grouping of individual rice brands in a city or county under one representative brand is the most preferred by Korean consumers. Even though the suggestion in this paper may not be acceptable to every case of rice brands in the Korean market, the findings might act as a guideline in developing a policy to cut down the number of Korean rice brands.

I. Introduction

The Korean government has supported rice producers, including RPCs (rice processing complexes), to launch their own rice brands in the Korean market. Recently, Korean consumers find more than 1,700 rice brands in the market, and they are confused as there are too many rice brands. According to surveys, only 56% of Korean consumers remember the brand of rice that they recently bought. Rice producers, especially small ones, also have trouble in managing their brands.[1]

Many experts agree that in order to improve the brand power of rice and increase the effectiveness of policies supporting rice brands, the number of rice brands in the Korean market should be decreased and the Korean government should consider changing its policy from one that promotes the development and launching of an individual rice brand for each producer to one that promotes the grouping of some rice brands under one representative brand that covers a certain production area.

Many studies have already been conducted about branding of agricultural products including rice. Most researches on rice brands usually focus on analyzing the effect of brands on consumers' behavior. For example, Chea et al. (2006), Ko et al. (2003), Park et al. (2005), Park et al. (2007) and Lee et al. (2003a) discussed about the attributes of rice brands and/or the differences among rice brands, through consumers surveys, and then suggested strategies to strengthen the perception of rice brands. Some researchers studied the characteristics of special rice brands. Kim et al. (2000) analyzed the consumers' perception of Chung-poong-myung-wol, the brand of Chungcheongnam-do, while Lee et al. (2000) studied the consumers' preference of city or county brands of rice in Gyeonggi-do. Lee et al. (2003b) measured the value of organic rice brands. However, little research was conducted to answer the question of how to decrease the number of rice brands. No study has yet presented a suitable size of production area that can be covered by a representative brand.

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[1] Park et. al (2009).

The main goal of this study is to analyze consumers' preference for rice brands and to suggest a way to decrease the number of rice brands in the Korean market by grouping individual brands. For more specific and empirical discussions, this study measured the level of consumers' preference for several types of representative rice brands that cover different sizes of production area (i.e. at city or county, and provincial levels).

II. Overview of Korean Rice Brands

1. Current Status of Brands in Korean Rice Market

Recently, the number of Korean rice brands has decreased a little, but Korean consumers still find more than 1.7 thousand brands in the market. Due to the constant effort by the government and municipalities to group individual rice brands, the number of representative brands covering cities, counties or provinces has decreased. The number of individual rice brands showed a 9.5% decrease in 2008 from 2006. Especially in the case of individual brands owned by Nonghyup RPCs or private RPCs, the number decreased by around 17%.

TABLE 1.　Change in the number of Korean rice brands

unit: ea, %

		2004	2006 (A)	2008 (B)	B-A	% Change
Brand of province		3	4	4	-	-
Brand of city or county		86	82	100	18	22.0
Individual brand	Nonghyup RPC	-	540	475	△65	△17.7
	Private RPC	-	367	303	△64	△17.4
	Others	-	880	839	△41	△4.7
	Subtotal	1,841	1,787	1,617	△170	△9.5
Total		1,930	1,873	1,721	△152	△8.1

Source: Ministry for Food, Agriculture, Forestry and Fisheries (Modified)

The status of Korean rice brands is shown at Table 2. As of 2008, the numbers of representative brands at provincial level and at city or county level are 4 and 100, respectively. The number of these brands accounts for only 6% of total number of rice brands in Korea. The number of individual brands owned by others, including individual farmers or small groups of farmers, is 839, which holds 48% of total brands.

Comparing the numbers of brands per user may hint about the facility of managing brands by users. The numbers of brands of province and city or county per user are 0.1 and 0.4, respectively, which means that 10 or 2.5 users were using one brand. However, the numbers of individual brands per user are from 1.4 to 2.9, which means that one user used more than one brand. Thus, the users of individual brand might have problem in managing their brands efficiently.

This difficulty of managing individual brands can also be shown by comparing the ratios of brands without legal protection. The ratio of individual brands without legal protection is 65%, while the ratios at city or county level and provincial level are 13% and 0%, respectively.

TABLE 2. Current status of rice brands (2008)

unit: ea

	No. of brands (A)	No. of users (B)	A/B	Legal protection of brand			
				Trademark right	Design right	Certification of quality	No protection
Brand of province	4	42	0.1	4	3	1	-
Brand of city or county	100	248	0.4	75	23	25	13
Individual brand — Nonghyup RPC	475	225	2.1	184	66	57	302
Individual brand — Private RPC	303	105	2.9	80	20	22	203
Individual brand — Others	839	610	1.4	162	39	76	549
Individual brand — Subtotal	1,617	940	1.7	426	125	155	1,054
Total	1,721	1,229	1.4	505	151	181	1,067

Note: The numbers of trademark rights, design rights and certifications of quality may be overlapped.
Source: Ministry for Food, Agriculture, Forestry and Fisheries (Modified)

Table 3 presents the geographical affiliation of rice brands. The provinces that have a rice brand of their own are Kwangju, Gyeonggi, Chungnam and Jeonnam. In terms of individual brand, Chungnam has the most individual brands and Jeonnam, Gyeongbuk, Gyeonggi and Gyeongnam have more than 200 individual brands.

TABLE 3. Geographical affiliation of rice brands (2008)

unit: ea

		Total		Brand of province		Brand of city or county		Individual brand	
		No. of brands	Brands per user	No. of brands	Brands per user	No. of brands	Brands per user	No. of brands	Brands per user
	Total	1,721	1.4	4	0.1	100	0.4	1,617	1.7
Metropolis	Seoul	1	0.1	-	-	-	-	1	0.1
	Busan	15	1.4	-	-	-	-	15	1.4
	Taegu	12	4.0	-	-	-	-	12	4.0
	Incheon	48	1.5	-	-	4	0.4	44	2.2
	Kwangju	17	1.7	1	1.0	-	-	16	1.8
	Daejeon	4	1.0	-	-	-	-	4	1.0
	Ulsan	17	3.4	-	-	-	-	17	3.4
Gyeonggi		213	1.1	1	1.0	11	0.2	201	1.6
Kangwon		101	1.3	-	-	9	0.4	92	1.7
Chungbuk		106	1.5	-	-	7	0.5	99	1.7
Chungnam		315	1.3	1	0.1	15	1.0	299	1.4
Jeonbuk		159	1.5	-	-	7	0.4	152	1.8
Jeonnam		270	1.4	1	0.03	24	0.6	245	2.0
Gyeongbuk		234	1.5	-	-	14	0.4	220	1.8
Gyeongnam		209	2.1	-	-	9	0.6	200	2.4

Source: Ministry for Food, Agriculture, Forestry and Fisheries (Modified)

The number of brands per user is the largest in Taegu (4.0), which means that one user managed four rice brands. Ulsan has the second largest number of brands per user (3.4). One of the reasons for that Taegu and Ulsan have relatively more brands per user might be that brand users in that areas don't have any representative brand covering city, county, or province. No representative brand might mean that local government or higher group of RPCs at city, county or province level, such as local branch of Nonghyup (National Agricultural Cooperative Federation), does not strive to manage the rice brands through grouping. If brand users have more chances to use the representative brands, the less individual brands would be used and the number of brands per user should be decreased.

2. Government Policy

The Korean government started the program to support rice brands in the early 2000s. The MIFAFF (Ministry for Food, Agriculture, Forest and Fisheries) has usually focused on promoting good rice brands, while local governments have endeavored to launch as many rice brands as they like in the market.

Recently, MIFAFF set up a plan to foster 100 good rice brands until 2013, and made a road map as shown in Table 4. MIFAFF selects 12 good brands through contests every year, and supports the owners of these brands.

TABLE 4.   Plan of government for supporting rice brands

unit: ea, %

	Road map					
	2008	2009	2010	2011	2012	2013
Number of brands of city or county (the aggregate)	16	26	40	60	80	100
Percent of rice with a brand in the market	15	22	28	34	40	50
Governmental support - Number of good brands elected at contest	12	12	12	12	12	12
- Other programs for promotion or consulting	In progress					

Source: Ministry for Food, Agriculture, Forestry and Fisheries (Modified)

Table 5 shows the government's plan to offer financial support to good rice brands. In 2008, 17.6 billion won was invested in eight rice brands for upgrading facilities and supporting their promotion through such means as advertising or consulting programs.

TABLE 5. Government plan for financial support

unit: million won

	2007	2008	2009 and later
Total	17,600 (8 brands)	17,600 (8 brands)	268,800 (84 brands)
Upgrading facilities	16,000	16,000	252,000
Supporting promotion or consulting	1,600	1,600	16,800

Source: Ministry for Food, Agriculture, Forestry and Fisheries (Modified)

Local governments also recently realized the problem stemming from too many rice brands in the market, and thus started grouping individual brands in their area. However, the question as to what is the best size of production area covered by a representative brand is not decided yet.

III. Analysis on Consumers' Preference of Rice and Rice Brands

1. Survey Analysis

In order to obtain data for model analysis, we firstly performed a survey of 400 Korean consumers, which consisted of 200 consumers in the Seoul metropolitan area and 200 consumers in other cities. After the survey, reliable results were collected from 358 respondents: 158 in Seoul, 100 in Kwangju and 100 in Taegu. Table 6 shows the characteristics of respondents of this survey.

TABLE 6. Characteristics of respondents

unit: %

Age	20s	30s	40s	50s	60s and older	Total
	25.1	25.1	24.9	23.2	1.7	100.0
Income	less than 2 mil. won	2 ~ 3 mil. won	3 ~ 4 mil. won	4 ~ 5 mil. won	more than 5 mil. won	total
	7.0	18.2	36.9	22.3	15.6	100.0
Education	high school or lower	tech/comm college	university and higher	-	-	total
	62.6	11.7	25.7	-	-	100.0

According to the result of the survey, most respondents usually bought rice at discount stores, which sell many kinds of rice at relatively lower prices. Ten percent of respondents purchased rice at specialty stores and 7% of respondents directly bought rice from farmers through web shopping or other ways.

TABLE 7. Place to purchase rice

unit: ea, %

	Number of respondents	Percent
Discount store	248	69.3
Specialty store for rice	35	9.7
Department store	5	1.4
Internet mall	6	1.7
Specialty store for organic products	2	0.6
Direct purchase from farm	25	7.0
Get from family	11	3.1
Nonghyup[1]	4	1.1
Small-size grocery store	22	6.1
Total	358	100.0

Note 1) Small mart at Nonghyup bank and other similar area. Hanaro mart is included in discount store.

Table 8 presents Korean consumers' concerns for the purchase of rice. Generally, respondents think that taste and price are the most important to select rice in the market. Next, brand and production area are considered important attributes. Functional attribute, such as rice with vitamins or chemicals, is not very important to respondents.[2]

The importance of brand is much higher in Seoul (16%) than other cities (5% or 12%), because consumers in Seoul find relatively more various brands in the rice markets. Rice brand is also considered an important attribute for selection to respondents with higher income. For example, respondents with more than five million won as monthly home income showed four times higher concerns about brand than respondents with less than two million won.

TABLE 8.　Concerns to purchase rice

unit: ea, %

		Total	Production area[1]	Brand	Safety	Price	Taste	Functional attribute	Package design	Others
	Total	358 (100.0)[2]	42 (11.7)	43 (12.0)	8 (2.2)	70 (19.6)	190 (53.1)	1 (0.3)	2 (0.6)	2 (0.6)
Area[3]	Seoul	158	(15.8)	(23.4)	(1.9)	(12.7)	(45.6)	(0.0)	(0.0)	(0.6)
	Kwangju	100	(5.0)	(2.0)	(3.0)	(11.0)	(78.0)	(0.0)	(1.0)	(0.0)
	Taegu	100	(12.0)	(4.0)	(2.0)	(39.0)	(40.0)	(1.0)	(1.0)	(1.0)
Income	Less than 2 mil. won	25	(4.0)	(8.0)	(0.0)	(40.0)	(40.0)	(0.0)	(4.0)	(4.0)
	2 ~ 3 mil. won	65	(12.3)	(7.7)	(1.5)	(18.5)	(58.5)	(0.0)	(1.5)	(0.0)
	3 ~ 4 mil. won	132	(12.9)	(12.1)	(3.8)	(18.9)	(51.5)	(0.8)	(0.0)	(0.0)
	4 ~ 5 mil. won	80	(8.8)	(13.8)	(1.3)	(18.8)	(57.5)	(0.0)	(0.0)	(0.0)
	more than 5 mil. won	56	(16.1)	(16.1)	(1.8)	(14.3)	(50.0)	(0.0)	(0.0)	(1.8)

Note 1) 'Production area' is the region where rice is produced and packed.
　　　 2) Numbers in the parentheses are percent.
　　　 3) 'Area' is the market area of rice.

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[2] Production area is the area where rice is produced and packed.

2. Conjoint Analysis

2.1. Model and Profiles

A conjoint analysis was conducted to examine the attributes of consumers' be-havior on Korean rice, which includes price, brand, production area, food safe-ty, quality, and others. For this analysis, consumers' preference trend about each attribute, which constitutes product or service, shall be analyzed using one of the following preference models: vector model, ideal model, and part worth function model. The vector model assumes that consumer's preference keeps increasing or decreasing depending on the strength of attribute, and the ideal model supposes that there is one specific ideal point which is most pre-ferred by consumers. The part worth function model measures the effect (part worth) of each attribute's level on the whole preference of consumers, without any assumptions about each attribute. In this paper, the part worth function model is taken for analysis.

Next, the methodology to collect data from respondents needs to be decided. The full-profile method considers all attributes simultaneously and makes respondents rank profiles, while the trade-off method lets respondents evaluate two attributes at the same time. Even though the trade-off method is easy for respondents, this method is not realistic.[3] Thus, the full-profile meth-od was used for this study.

In order to develop profiles, four attributes (production area, brand, category, and price) are set up. Then, each attribute is weighted according to its strength. In terms of attributes, production area is classified into Gyeonggi, Chungcheong, Honam, Youngnam and Kangwon, while brand is classified into provincial, city or county, and individual brands. The attribute of category is classified into general rice, organic rice and functional rice. Lastly, price is classified into four levels: 45 thousand won, 55 thousand won, 65 thousand won, and 75 thousand won.

Based on the above, 25 profiles were developed as shown in Table 9. The maximum number of possible profiles actually reaches 180 (5×3×3×4).

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[3] In the real market, consumers evaluate all attributes at a time.

But, since measuring consumers' preference with 180 profiles is rarely practical in the real world, we took 25 profiles through fractional factorial design using an orthogonal design of the SPSS program. In addition, four more profiles were created to verify the confidence and validity of this analysis.

TABLE 9. Conjoint profiles for analysis

Profile	Production area	Brand	Category	Price
1	Chungcheong	Brand of city or county	Organic rice	45 thousand won
2	Youngnam	Individual brand	Organic rice	55 thousand won
3	Kangwon	Individual brand	Organic rice	65 thousand won
4	Honam	Brand of province	Organic rice	45 thousand won
5	Youngnam	Brand of city or county	General rice	65 thousand won
6	Youngnam	Brand of province	Organic rice	75 thousand won
7	Gyeonggi	Brand of province	Rice with functional attribute	65 thousand won
8	Honam	Brand of city or county	General rice	75 thousand won
9	Youngnam	Brand of city or county	Rice with functional attribute	45 thousand won
10	Kangwon	Brand of city or county	Organic rice	45 thousand won
11	Chungcheong	Brand of province	Organic rice	75 thousand won
12	Kangwon	Brand of city or county	Rice with functional attribute	75 thousand won
13	Honam	Brand of city or county	General rice	55 thousand won
14	Gyeonggi	Individual brand	General rice	75 thousand won
15	Chungcheong	Individual brand	General rice	45 thousand won
16	Gyeonggi	Brand of province	General rice	45 thousand won
17	Chungcheong	Brand of province	Rice with functional attribute	55 thousand won
18	Honam	Brand of province	Organic rice	65 thousand won
19	Youngnam	Brand of province	General rice	45 thousand won
20	Kangwon	Brand of province	General rice	45 thousand won
21	Gyeonggi	Brand of city or county	Organic rice	55 thousand won
22	Gyeonggi	Brand of city or county	Organic rice	45 thousand won
23	Chungcheong	Brand of city or county	General rice	65 thousand won
24	Honam	Individual brand	Rice with functional attribute	45 thousand won
25	Kangwon	Brand of province	General rice	55 thousand won

In order to get more exact results from surveying, each attribute was explained to respondents through materials and oral explanation. For instance, each rice brand was explained as shown at Table 10, and the differences among general rice, organic rice and rice with functional attribute are explained.[4],[5]

TABLE 10. Example of explanation of attributes: Brands

Brand	Explanation
Individual brand	This brand is made and used by individual Nonghyup RPC, private RPC, or other rice producer. The examples of individual brand may be Noo Nae Chan, Tae An Wang Rice, Cham Nong Rice, Gam Mi Ro Un Rice and others.
Brand of city or county	This brand is mainly made by local government and used together by Nonghyup RPC, private RPC, or other rice producer in that area (city or county). The examples of brand of city or county may be Han Nun Ae Ban Han Rice, Gem Rice, Im Gum Nim Rice, An Sung Ma Choom, Na Bee Rice and others.
Brand of province	This brand is mainly made by local government and used together by Nonghyup RPC, private RPC, or other rice producer in that area (province). The examples of brand of province may be Chung Poong Myung Wal, EQ Eun Go Eul, Poog Kwang Soo To and Bit Chan Dul.

2.2. Results

Conjoint analysis offers the values of factor importance and part worth of attributes, which are shown at Figure 1.[6] In order to get estimates which are

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[4] Organic rice was explained as the rice which is cultivated without any pesticide and chemicals, and rice with functional attribute was explained as the rice with special functional factor like some mineral or ingredient. Interviewers explained these rice with some photo examples.

[5] Reader with interest about the survey paper for this research can request the related materials to authors.

[6] The estimates of importance shown at Figure 1 are 20.09 (production area), 11.31 (brand), 19.30 (category) and 49.30 (price). The estimates of part worth at each attribute are as the following:

statistically acceptable, we verified the results with Pearson's R and Kendall's tau: the Pearson's R = 0.997 (p<0.001) and Kendall's tau = 0.980 (p<0.001).[7]

Among the four attributes, respondents consider price (49%) as the most important attribute. The level of factor importance of brand is 11%, which is perceived as the least important.[8] In the case of production area, the rice produced in Gyeonggi area is the most preferred by respondents, and the rice from Kangwon area is also welcomed. However, respondents least prefer the rice from Youngnam area. Respondents show the most preference for organic rice. Among rice brands, respondents most prefer city or county brands, whereas individual brands are least preferred. Respondents also show that the cheaper rice is the better.

The results of factor importance of rice brand can offer a few implications to decrease the number of rice brands in the Korean market. First, the level of Korean consumers' preference of individual rice brand is the lowest. That offers the necessity to group individual rice brands in Korea. Second, the finding that Korean rice consumers more like the brands of city or county than individual brands or brands of province suggests to group individual brands under one city or county brand. In order to get more implications, virtual market share under several scenarios will be conducted.

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1) Production: Gyeonggi (0.3834), Chungcheong (-0.1010), Honam (-0.1696), Youngnam (-0.2094) and Kangwon (0.0966)

2) Brand: Brand of province (-0.0104), Brand of city or county (0.1408) and Individual brand (-0.1303)

3) Category: General rice (-0.4602), Organic rice (0.3928) and Rice with functional attribute (0.0675)

4) Price: 45 thousand won (1.4363), 55 thousand won (0.4309), 65 thousand won (-0.5450), 75 thousand won (-1.3221)

[7] At the first test, we found 32 cases with negative correlation of Kandall's taus, which means the low reliability of response. After fixing that problems, we conducted conjoint analysis. Finally, we could get the results that are statically reliable: the Pearson's R = 0.997 (p<0.001) and Kendall's tau = 0.980 (p<0.001).

[8] Table 8 presents that Korean consumers are most concerned about taste in buying rice at the market. However, our conjoint analysis didn't consider taste as an attribute because taste is rarely possible to measure.

FIGURE 1. Factor importance and part worth of attributes
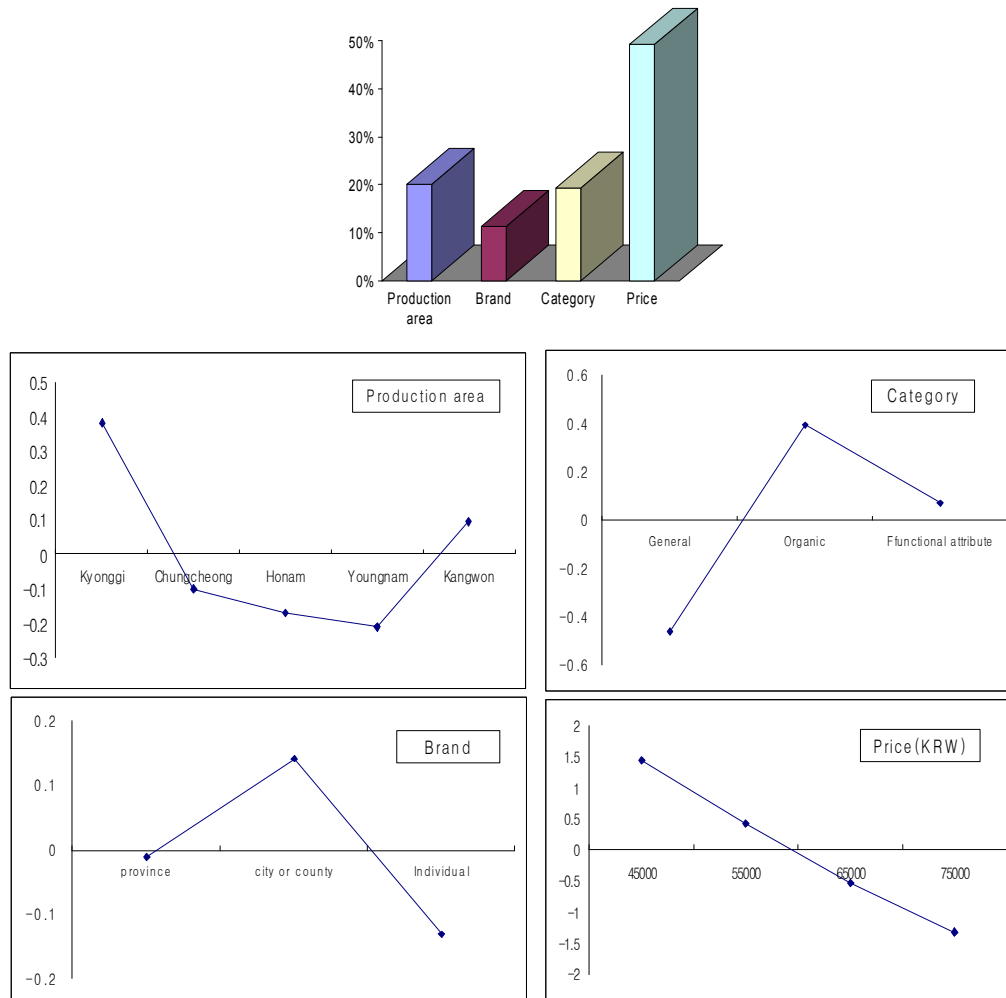
3. Virtual Market Share

Using the part worth derived from the conjoint analysis, virtual market shares were estimated. Specifically, we set up virtual scenarios based on the attributes of rice, and estimated virtual market shares for each scenario. A few models may be considered to estimate the virtual market share: max utility model,

BTL model (Bradley-Terry-Luce model), and logit model. The max utility model, which is usually used for durable goods, assumes that respondents select only one product offering the largest utility. The BTL model assumes that respondents select probability log products as the ratio of utilities. The logit model, which is similar to BTL model, uses the expected value of utility for the selection probability, and usually is used for consumption goods. In this paper, the logit model was taken to estimate virtual market shares.

FIGURE 2. Logit model for the estimation of virtual market share
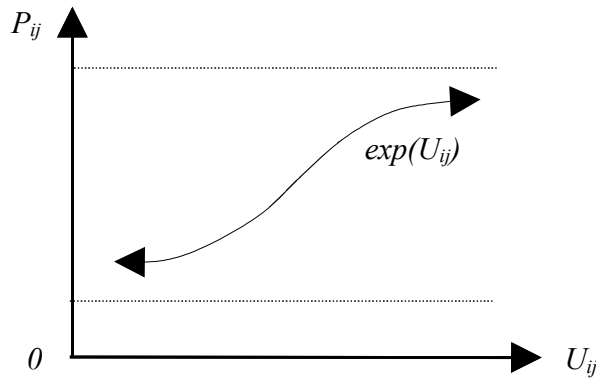
Logistic share of utility: $P_{ij} = \dfrac{e^{u_{ij}}}{\sum_{j} e^{u_{ij}}}$

where P_{ij} is the probability i^{th} consumer select j^{th} product, u_{ij} is the utility value of the jth product evaluated by i^{th} consumer[9].

Table 11 presents four scenarios developed based on price, which was suggested as the most important attribute in the conjoint analysis.[10] Basically, we set up four cases of price: 45 thousand won, 55 thousand won, 65 thousand won and 75 thousand won. Each scenario has various profiles with different production area, brand and category.

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[9] The utility value (u_{ij}) is calculated with the values of importance and part worth at Figure 1 (the utility value = importance value × value of part worth).

[10] Actually, we assumed more scenarios and tested, but found that the results of these four scenarios are statistically reliable.

TABLE 11. Profiles by scenario (Price standard)

Scenario	Code	Production area	Brand	Category	Price
Scenario 1	1-1	Chungcheong	Brand of city or county	Organic rice	45 thousand won
	1-2	Honam	Brand of province	Organic rice	
	1-3	Youngnam	Brand of city or county	Rice with functional attribute	
	1-4	Kangwon	Brand of city or county	Organic rice	
	1-5	Chungcheong	Individual brand	General rice	
	1-6	Gyeonggi	Brand of city or county	Organic rice	
	1-7	Honam	Individual brand	Rice with functional attribute	
Scenario 2	2-1	Youngnam	Individual brand	Organic rice	55 thousand won
	2-2	Chungcheong	Brand of province	Rice with functional attribute	
	2-3	Gyeonggi	Brand of city or county	Organic rice	
	2-4	Kangwon	Brand of province	General rice	
	2-5	Chungcheong	Brand of city or county	Rice with functional attribute	
Scenario 3	3-1	Kangwon	Individual brand	Organic rice	65 thousand won
	3-2	Gyeonggi	Brand of province	Rice with functional attribute	
	3-3	Honam	Brand of province	Organic rice	
	3-4	Chungcheong	Brand of city or county	General rice	
	3-5	Gyeonggi	Brand of city or county	Organic rice	
	3-6	Honam	Brand of city or county	General rice	
Scenario 4	4-1	Youngnam	Brand of province	Organic rice	75 thousand won
	4-2	Honam	Brand of city or county	General rice	
	4-3	Chungcheong	Brand of province	Organic rice	
	4-4	Kangwon	Brand of city or county	Rice with functional attribute	
	4-5	Gyeonggi	Individual brand	General rice	

The estimated values of virtual market shares are presented at Table 12.[11] In scenario 1, code 1-6 has the largest share (22%) and code 1-4 has the second largest share (18%). These results imply that rice with a city or county brand takes a more market share. In scenarios 2, 3, and 4, where prices

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[11] Since organic rice and/or rice with functional attribute show more importance than general rice, their virtual market share may be higher than the real situation.

are higher than scenario 1, rice with a city or county brand attains a relatively large share in the virtual markets.

TABLE 12.   Virtual market shares: scenario 1~4

Scenario	Code	Logit (%)	Scenario	Code	Logit (%)
Scenario 1	1-1	16.09	Scenario 3	3-1	20.84
	1-2	13.12		3-2	18.78
	1-3	12.83		3-3	16.87
	1-4	18.22			
	1-5	6.64		3-4	8.64
	1-6	21.55		3-5	26.99
	1-7	11.56		3-6	7.88
Scenario 2	2-1	20.81	Scenario 4	4-1	24.07
	2-2	17.95		4-2	10.94
	2-3	31.71		4-3	25.32
	2-4	10.24		4-4	25.92
	2-5	19.29		4-5	13.74

Now, other scenarios were developed based on category and price. In this case, only two scenarios show statistically reliable results. Scenario 5 estimates the virtual market share of general rice at 55 thousand won as price, while scenario 6 estimates the market share of organic rice at 65 thousand won.

TABLE 13.   Profiles by scenario (Price & category standard)

Scenario	Code	Production area	Brand	Category	Price
Scenario 5	5-1	Honam	Brand of city or county	General rice	55 thousand won
	5-2	Kangwon	Brand of province		
	5-3	Youngnam	Brand of province		
Scenario 6	6-1	Kangwon	Individual brand	Organic rice	65 thousand won
	6-2	Honam	Brand of province		
	6-3	Gyeonggi	Brand of city or county		

Table 14 presents the virtual market shares under scenario 5 and 6. Similar to the above results, general rice or organic rice takes a more virtual market share when they have a representative brand at the city or county level.

TABLE 14.   Virtual market shares: scenarios 5~6

Scenario	Code	Logit (%)	Scenario	Code	Logit (%)
Scenario 5	5-1	35.86	Scenario 6	6-1	31.36
	5-2	34.84		6-1	27.46
	5-3	29.30		6-3	41.18

With the findings from the estimation of virtual market share, grouping rice brands under the brand of city or county is suggested as the best way for grouping individual brand in Korean rice market. Under scenario 1 to 4, which are developed based on price, the case of brand of city or county take the largest virtual market share.[12]

This implication is also derived from the results under scenarios 5 and 6, which are developed based on category and price. These results also reinforce the discussion through conjoint analysis that suggests to group rice brands under one representative brand at city or county level.

IV. Conclusion

This paper might provide a clue to the question, "How to decrease the number of rice brands?" Even though many researchers and the government agree on decreasing the number of Korean rice brands, which exceeds 1,700, the way to decrease the rice brands is still contested. Recently, the government took

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[12] Since consumers might show more preference for organic rice or rice with functional attribute, the virtual market share of them can usually be higher than general rice. However, the results of estimations of virtual market share still support that grouping rice brands under the brand of city or county is generally preferred by consumers because organic rice or rice with functional attributes get more preference when they have city or county brand.

an initiative to group individual rice brands under one representative brand at city or county level or at provincial level.

In order to discuss this issue, we first performed a survey of 400 Korean consumers, which consisted of consumers in the Seoul metropolitan area and other cities. A conjoint analysis was conducted to identify consumers' preferences of Korean rice regarding producing area, brand, classification, and price. We especially focused on analyzing the consumers' preference of rice brands, with some scenarios to decrease the number of brands. The virtual market shares of rice brands were also estimated with the logit model.

The results from the several analyses with models present that Korean consumers show the lowest preference on the individual rice brand and the highest preference on the brand of city or county. The virtual market shares estimated under 6 scenarios also show that Korean rice with the brand of city or county takes the largest share. Therefore, we can suggest that the grouping of individual city or county rice brands under one representative brand may be most preferred by Korean consumers.

In fact, the suggestion in this paper may not be acceptable to every case in the Korean rice market. According to consumer surveys, consumers consider "taste" or "price" as the most important thing in selecting rice, which might imply grouping rice brands is not very meaningful for them. However, we hope that the findings in this paper will act as an initial guideline for developing a policy to decrease the number of Korean rice brands.

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