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Assessing competitiveness of foreign and local supermarket chains in Vietnamese market by using Fuzzy TOPSIS method

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Considering the strategic importance for supermarket chains and to understanding the critical elements affecting their competitiveness and their relative level of competitiveness, this study tries to assess competitiveness of foreign and local supermarket chains in Vietnam using the fuzzy TOPSIS method. The results show that, even smaller size Vietnamese supermarket chains, when compared to foreign chains, are still slightly higher in competitiveness.

Keywords: Competitiveness; Supermarket chains; Fuzzy TOPSIS

INTRODUCTION

2009 was marked as an important milestone for the Vietnamese retail industry with the fully opening up of the market under Vietnam's commitment to WTO. The wave-entry of new international retailers (e.g. Dairy Farm, Best Denki, Family Mart) in the beginning of 2009 together with the existing foreign players (e.g. METRO, Casino, Parkson, Bourbon, and Lotte groups etc.) pushed the Vietnam retail market to the new period of development. Modern retail formats such as convenience stores, small shopping complexes, supermarkets and so forth became more familiar to Vietnamese customers. Supermarket chains springing up became a dominant format in the country (Hong, 2009).

Competition for a share of supermarket chains has

been heating up among domestic and foreign competitors since Vietnam opened its retail market. With the competitive advantages in capital and experience, foreign firms are ambitious in dominating the market. For example, Metro (a giant German brand) urged to expand its chain after investing $100 million-$120 million for each of its 10 outlets around the country. Big C (a French supermarket chain) also opened its ninth supermarket in central Hue with a total investment capital of $17 million. Under threats from foreign rivals, domestic supermarket chains with their advantages in having proximity locations and understanding local customers, however, are rushing to upgrade their distribution systems. Saigon Co., the largest local supermarket chain in southern Vietnam expects to open other 20 stores in HCMC (Hochiminh city) next year (2012) and increase the number of outlets to 120 by 2012. Citimart, which has opened four new supermarkets since late 2008, also expects to open 10 more next year (2012). All local chains, furthermore, are

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Table 1: Research background

	Metro	Big C	SG Co-op	Hapromart
Country of origin	Germany	French	Vietnam	Vietnam
Market Entry	2002	1998 : Casino 2004: Big C	1996	2006
No of Stores	10	7	35	14
Avg. of Display Area	5,000 m^2	5,000 m^2	3,500 m^2	1,200 m^2

joining forces to have a better competition against their foreign rivals. Therefore, the competition between foreign and local supermarket chains becomes more intense.

Considering the strategic importance for supermarket chains and to understanding the critical elements affecting their competitiveness and their relative level of competitiveness, this research tries to assess competitiveness of foreign and local supermarket chains using the fuzzy TOPSIS method. Based on the results, we identified the areas where improvements are required to help these supermarket chains increase their competitiveness.

Recently Vietnam has more than 10 supermarket chains, which are Saigon Co.op Mart, Citimart, Maximark, Fivimart, Hapro Mart, Sivimart, Satra (local chains); Metro Cash and Carry, Big C, Cora and Lotte Mart (foreign chains). To assess the competitiveness of foreign and local supermarket chains in Vietnam, only well-known and representative supermarket chains are considered. Two chosen foreign chains are Metro Cash and Carry and Big C, who are the first international retailers in Vietnamese market and their brands are now popular among Vietnamese consumers. Two local chains are Saigon Co-op Mart – a top retailer in southern Vietnam – ranked on the Top Vietnam Retailer and Asia Pacific Top 500 Retailer in six consecutive years and Hapromart – top retailer in northern Vietnam, who is now dominating in Hanoi and some nearby provinces (See table 1).

Competitive factors of supermarket chains in Vietnam

From customers' perspective, the concept of competitive factors of retail chain stores can be considered as the determinants of retail patronage which includes such key concepts as store choice and frequency of visit (Yue and Zinkhan, 2006). Levy and Weitz (2008) suggested a retail strategy that included six important elements in the retail mix such as location, merchandise assortments, pricing, communication mix, store design and display, and customer- service.

The retail mixes include the decision variables which retailers use to satisfy customer needs and influence their purchase decision (Levy and Weitz, 2008); therefore, they are useful for assessing competitiveness of supermarket chains. Considering Vietnamese customers' habits and combining with Levy and Weitz's suggestion, to this end, 12 evaluation criteria are investigated as competitive factors for assessing supermarket chains' competitiveness in Vietnam from customers' perspective (Table 2). These factors are explained as follows:

Home proximity: Location plays a prominent role in retailing because it is one of the most influential considerations in a customer's store choice decision (Levy and Weitz, 2008). Regarding location issues, home proximity is one of the first considerations that affect supermarket chains' competitiveness, because motorbike is now the most common means of transportation in Vietnam, it is also the most often used for consumers to go to supermarkets (Agro Vietnam, 2008). The buying-near-home habit of Vietnamese consumers made all of supermarkets' managers in Vietnam pay special attention to home proximity when deciding locations for their stores.

Traffic convenience: In the modern environment, traffic convenience is a key benefit that shoppers seek for. Consumers' perceived expenditure of time and effort influences their perceptions of service convenience (Berry et al., 2002). The more convenience in terms of traffic, the more competitive a supermarket chain is, because a central location can reduce the transaction costs associated with shopping (e.g. transportation cost, time spent). Empirical evidence also support these theories by showing that 79% of Vietnamese customers care about traffic convenience since traffic infrastructure is a problem in Vietnam (Agro Vietnam, 2008).

Convenient parking facilities: The research of Food consumption in Hanoi and HCMC showed that 74.8% of Vietnamese consumers consider parking facilities when they choose a supermarket for shopping (Agro Vietnam, 2008). This is especially true for an emerging market like

Table 2: Evaluation criteria used for assessing competitiveness of supermarket chains

	Evaluation criteria
Location	C1. Home proximity
	C2. Traffic convenience
	C3. Convenient parking facilities
Customer Service	C4. Fast checkout
	C5. Friendliness of salespeople
	C6. Merchandise quality
Store Design and Display	C7. Clean and comfortable atmosphere
	C8. Well-ordered display
Communication Mix	C9. Supermarket chain's image
	C10. A lot of promotional programs
Pricing	C11. Competitive price
Merchandise Assortment	C12. Wide selection of products

Vietnam where infrastructure is now under developing process. The supply of retail space is still limited and many shopping centers are dealing with parking facilities' problems (Leech, 2010). Having a convenient parking facility will ensure the competitiveness of retailers in Vietnamese market.

Fast checkout: Time pressures that many people have experienced are having a major effect on consumer behavior (Lambert, 1979). Time saving for consumers is readily recognized and therefore likely to influence customers' choice of retail outlet and supermarkets' competitiveness. The research of Food consumption in Hanoi and HCMC showed that 88.2% of Vietnamese customers care about quick payment process when shopping (Agro Vietnam, 2008).

Friendliness of salespeople: Retail stores offer a chance for human interactions; thus may drive some shoppers to stores in which they find salespeople friendly and communicative (Yue and Zinkhan, 2006). Friendliness of sales people is especially an important competitive factor of supermarket chains in Vietnam regarding Vietnamese characteristics of being friendly and nice. 37.4% Vietnamese consumers consider friendliness of salespeople when they choose a supermarket for shopping (Agro Vietnam, 2008).

Merchandise quality: A consumer's perception of the quality of a store's merchandise relates to the patronage of that store (Darley and Lim, 1993). In brief, merchandise determines a retailer's reputation and influences consumers' choice about stores. In the case of Vietnam, merchandise quality is a very important competitive factor of supermarket chains when 94% Vietnamese customers

care about quality of products in stores (Agro Vietnam, 2008).

Clean and comfortable atmosphere: Store atmospherics deal strictly with the physical store attributes. Research on retailing stores has revealed that many consumers are prone to make a decision about where to shop on the basis of their attitude toward the store environment (Finn and Louviere, 1996). In the case of Vietnam, 56.9% customers agree that stores' cleanness and coolness is their first considerations when going shopping in supermarkets (Agro Vietnam, 2008).

Well-ordered display: As a major retailer, product selection and well-ordered display contribute significantly to the explanation of patronage of alternative retail centers (Koelemeijer and Oppewal, 1999). Not only can greater display help a retailer attract more consumers, it also can entice them to make purchases while in the retail center. In case of Vietnam, 58.4% customers agree that stores' well-ordered display will attract them to a retail store and thus affect stores' competitiveness (Agro Vietnam, 2008).

Supermarket chain's Image: The impressions of stores which is formed by shoppers have a significant impact on their store patronage and therefore on store's competitiveness because consumers tend to make judgments about stores on the basis of their subjective impressions, e.g., ambient design and social factors (Berry et al., 2002). In Vietnam, 54.9% of Vietnamese consumers care about the reputation of the supermarket when shopping (Agro Vietnam, 2008).

Promotional programs: Sales promotions are beneficial

to retailers in several aspects. For example, they are often used to trigger unplanned purchases (Laroch et al., 2003); encourage consumers to purchase non-promoted merchandise (Mulhern and Padgett, 1995); accelerate the number of shopping trips to the store (Walters and Rinne, 1986), or encourage consumers to stockpile, leading to a reduction of the retailer's inventory costs (Blattberg and Neslin,1981). 31.9% of Vietnamese consumers pay attention to promotional programs when shopping in supermarket (Agro Vietnam, 2008).

Competitive price: Low prices, in the form of either price promotions or general price levels, can create store traffic and increase category sales. At any markets, price and quality seem to be the leading factors in stores' competitiveness. This is especially true for an emerging market like Vietnam which possesses a great purchasing power yet limited capital. Up to 97.4% of Vietnamese customers say that they are interested in competitive prices when choosing supermarkets for shopping (Agro Vietnam, 2008).

Wide collection of products: A wide collection of products can minimize the perceived costs (e.g., travel time, effort) associated with each shopping trip and ease the shopping task (e.g., by enhancing comparison shopping). A supermarket that offers greater variety in product categories can improve shopping convenience and make it easier for consumers to combine their visits to different stores (Dellaert et al, 1998) and therefore can increase its competitiveness.

METHODOLOGY

The Fuzzy TOPSIS method

One of well-known classical Multi-Criteria Decision Making (MCDM) method, the fuzzy TOPSIS (Technique for Order Preference by Similarity to an Ideal Solution), was first developed by Hwang and Yoon (1981). It views a MCDM problem with m alternatives as a geometric system with m pointing in the n-dimensional space, based on the concept that the chosen alternative should not only have the shortest distance from the positive-ideal solution but also have the longest distance from the negative-ideal solution (Hwang and Yoon, 1981; Liu and Wang, 2007). The application of TOPSIS is particularly suitable for solving the group decision making problem under fuzzy environment and can be expressed in a series of steps with the mathematical concept borrowed from Wang et al., (2005) as follows:

Step 1: Determining the weighting of evaluation criteria; the importance of weights of various criteria and the

ratings of qualitative criteria must be considered as linguistic variables.

Step 2: Constructing the fuzzy decision matrix and choosing the appropriate linguistic variables for the alternatives with respect to criteria.

$$\widetilde{D} = \begin{matrix} & \begin{matrix} C_1 & C_2 & & C_n \end{matrix} \\ \begin{matrix} A_1 \\ A_2 \\ \vdots \\ A_m \end{matrix} & \begin{bmatrix} \tilde{x}_{11} & \tilde{x}_{12} & \cdots & \tilde{x}_{1n} \\ \tilde{x}_{21} & \tilde{x}_{22} & \cdots & \tilde{x}_{2n} \\ \vdots & \vdots & \ddots & \vdots \\ \tilde{x}_{m1} & \tilde{x}_{m2} & \cdots & \tilde{x}_{mn} \end{bmatrix} \end{matrix}, \quad i=1,2,\ldots,m; \ j=1,2,\ldots,n \quad (1)$$

$$\tilde{x}_{ij} = \frac{1}{k}(\tilde{x}_{ij}^1 + \tilde{x}_{ij}^2 + \cdots + \tilde{x}_{ij}^k)$$

where A_1, A_2, . . ., A_m are the alternatives to be chosen; C_1,C_2, . . . ,C_n denote the evaluation criteria; $\tilde{x}_{ij}^k$ represents the rating of alternative A_i with respect to criterion C_j evaluated by k evaluators, and $\tilde{x}_{ij}^k = \left(a_{ij}^k, b_{ij}^k, c_{ij}^k\right)$

Step 3: Normalizing the fuzzy decision matrix; the raw data are normalized to eliminate deviations with different measurement units and scales in several MCDM problems. In this study it is to preserve the property that the ranges of normalized TFNs (triangular fuzzy numbers) to be included in [0, 1]. The normalized fuzzy decision matrix denoted by $\widetilde{R}$ is calculated as following formula:

$$\widetilde{R} = [\tilde{r}_{ij}]_{m\times n}, \quad i=1,2,\ldots,m; \quad j=1,2,\ldots,n$$

Then the normalization process can be performed as:

$$\tilde{r}_{ij} = \left(\frac{a_{ij}}{c_j^+}, \frac{b_{ij}}{c_j^+}, \frac{c_{ij}}{c_j^+}\right) c_j^+ = \max_i c_{ij}$$

Step 4: Constructing weighted normalized fuzzy decision matrix; considering the different weights of each criterion, the weighted normalized decision matrix can be computed by multiplying the important weights of evaluation criteria and the values in the normalized fuzzy decision matrix as follows:

$$\widetilde{V} = [\tilde{v}_{ij}]_{m\times n}, \quad i=1,2,\ldots,m; \quad j=1,2,\ldots,n \quad (3)$$
$$\tilde{v}_{ij} = \tilde{r}_{ij} \otimes \tilde{w}_j \quad (4)$$

Where $\tilde{w}_j$ represents the importance weight of criterion C_j

Step 5: Determining the FPIS and FNIS; since the positive TFNs are included in the interval [0, 1], the fuzzy

positive ideal reference point (FPIRP, A+) and fuzzy negative ideal reference point (FNIRP, A-) hence can be defined as

$$A^+ = (\tilde{v}_1^+, \tilde{v}_2^+, \ldots, \tilde{v}_n^+)$$
$$A^- = (\tilde{v}_1^-, \tilde{v}_2^-, \ldots, \tilde{v}_n^-)$$

where $\tilde{v}_i^+ = (1,1,1)$ and $\tilde{v}_j^- = (0,0,0), j = 1, 2, \ldots, n.$

Step 6: Calculating the distance of each alternative from FPIRP and FNIRP
The distances (di+ and di-) of each alternative from A+ and A- can be calculated as:

$$d_i^+ = \sum_{j=1}^{n} d(\tilde{v}_{ij}, \tilde{v}_j^+), \quad i = 1, 2, \ldots, m; \quad j = 1, 2, \ldots, n \quad (7)$$

$$d_i^- = \sum_{j=1}^{n} d(\tilde{v}_{ij}, \tilde{v}_j^-), \quad i = 1, 2, \ldots, m; \quad j = 1, 2, \ldots, n \quad (8)$$

Where $d(\tilde{v}_a, \tilde{v}_b)$ represent the distance measurement between two fuzzy numbers, d_i^+ represents the distance of alternative Ai from FPIRP, and d_i^- denotes the distance of alternative Ai from FNIRP.

Step 7: Obtaining the closeness coefficient and ranking the alternatives. When the d_i^+ and d_i^- of each alternative have been calculated, CCi is defined to determine the ranking order of all alternatives by calculating similarities to ideal solution:

$$CC_i = \frac{d_i^-}{d_i^+ + d_i^-}, \quad i = 1, 2, \ldots, m \quad (9)$$

The index CCi indicates the gap from the alternative to FPIRP and FNIRP, and a large value of index CCi shows a good performance of the alternative Ai. Based on the value of CCi, we can determine the ranking of alternatives and select the best one among them.

In the recent years, fuzzy TOPSIS methods have been developed and applied widely in the different fields such as banking, solar power systems, maritime transportation network, selection of reverse logistics provider; etc (Wu et al., 2009).

RESULTS

Hanoi and HCMC were chosen for the survey since they are Vietnam's two biggest cities, in which customers are more familiar with and more frequently go to supermarkets for daily needs. A total of 500 samples were used in this study, in which 250 were used for Hanoi and 250 used for HCMC from September 25 to October 17, 2009. In 23 days of the survey, 450 customers responded to the questionnaire. Thus response rate was 450/500 = 90%. Data after collected were then used for conducting the fuzzy TOPSIS and analyzed by Matlab 7.4 program. Results of calculating priority weights of 4 chosen supermarket chains are discussed as follows:

Customers were requested to express their perception level of importance for each evaluation criterion in linguistic variables. An integrated fuzzy importance weight matrix for evaluation criteria is presented in Table 3. To understand the importance order of these performance criteria for supermarket chains in Vietnam, the center of area method is utilized to de-fuzzily the triangular fuzzy numbers into corresponding Best Non-fuzzy Performance (BNP) values.

The BNP values presented in Table 4 reveal that the most important performance criteria for assessing supermarket chains in Vietnam are ranked top to down as follows: Competitive price and Merchandise quality (0.797), Friendliness of salespeople (0.787), Home proximity (0.753), Fast checkout (0.740), Traffic convenience (0.667), Convenient parking facilities (0.657), Well-ordered display (0.567), Clean and comfortable atmosphere (0.557), Supermarket chain's image (0.55), Wide collection of products (0.52), and the lowest important criterion is A lot of promotional programs (0.517).

To ensure that the normalized triangular fuzzy numbers are included in the interval [0, 1], linear scale transformed functions were utilized in this study (Table 5). Since the importance weights of criteria are different, the weighted normalized fuzzy decision matrix can be obtained and the results are presented in Table 6.

The positive triangular fuzzy numbers are in the range [0, 1], so the fuzzy positive ideal reference point and fuzzy negative ideal reference point are defined as follows:

$$A^+ = [(1,1,1),(1,1,1),(1,1,1),(1,1,1),(1,1,1),(1,1,1),(1,1,1),(1,1,1),(1,1,1),(1,1,1),(1,1,1),(1,1,1)]$$

$$A^- = [(0,0,0),(0,0,0),(0,0,0),(0,0,0),(0,0,0),(0,0,0),(0,0,0),(0,0,0),(0,0,0),(0,0,0),(0,0,0),(0,0,0)]$$

The distance of each candidate supermarket chain to the fuzzy positive ideal reference point and fuzzy negative ideal reference point is shown in Table 7. Once the distances of supermarket chains from FPIRP and FNIRP are determined, the closeness coefficients can be obtained and are shown in Table 8. In which, the index CC_1 for the first supermarket chain (Metro Cash and Carry), for example, is calculated as:

$$CC_1 = \frac{d_1^-}{d_1^+ + d_1^-} = \frac{6.3269}{6.917 + 6.3269} = 0.4777$$

Table 3: The fuzzy decision matrix and fuzzy weights of the criteria

	A1	A2	A3	A4	Weight
C1	[0.17, 0.34, 0.53]	[0.3, 0.48, 0.67]	[0.58, 0.78, 0.93]	[0.58, 0.78, 0.92]	[0.57, 0.77, 0.92]
C2	[0.3, 0.49, 0.68]	[0.34, 0.53, 0.71]	[0.48, 0.68, 0.84]	[0.48, 0.68, 0.83]	[0.48, 0.68, 0.84]
C3	[0.36, 0.55, 0.73]	[0.36, 0.55, 0.74]	[0.33, 0.51, 0.7]	[0.24, 0.42, 0.61]	[0.47, 0.67, 0.83]
C4	[0.25, 0.43, 0.63]	[0.28, 0.46, 0.65]	[0.32, 0.51, 0.7]	[0.31, 0.5, 0.68]	[0.56, 0.76, 0.9]
C5	[0.26, 0.44, 0.63]	[0.31, 0.49, 0.68]	[0.3, 0.48, 0.67]	[0.31, 0.5, 0.68]	[0.61, 0.81 0.94]
C6	[0.38, 0.58, 0.76]	[0.36, 0.56, 0.74]	[0.36, 0.56, 0.74]	[0.31, 0.50, 0.69]	[0.62, 0.82, 0.95]
C7	[0.39, 0.59, 0.77]	[0.43, 0.63, 0.8]	[0.36, 0.55, 0.74]	[0.30, 0.49, 0.67]	[0.37, 0.56, 0.74]
C8	[0.4, 0.6, 0.77]	[0.43, 0.62, 0.8]	[0.35, 0.54, 0.72]	[0.36, 0.55, 0.73]	[0.38, 0.57, 0.75]
C9	[0.42, 0.62, 0.79]	[0.36, 0.56, 0.74]	[0.37, 0.56 0.74]	[0.37, 0.56, 0.74]	[0.36, 0.55 0.74]
C10	[0.32, 0.51, 0.69]	[0.38, 0.58, 0.76]	[0.30, 0.49, 0.68]	[0.3, 0.48, 0.67]	[0.32, 0.52, 0.71]
C11	[0.43, 0.62, 0.79]	[0.38, 0.57, 0.75]	[0.37, 0.57, 0.75]	[0.35, 0.55, 0.73]	[0.62, 0.82, 0.95]
C12	[0.35, 0.54, 0.73]	[0.35, 0.54, 0.72]	[0.35, 0.54, 0.73]	[0.33, 0.52, 0.7]	[0.33, 0.52, 0.71]

Table 4: Weight of each criterion

		Fuzzy Important Weight	BNP Value	Rank
C1	Home proximity	[0.57, 0.77, 0.92]	0.753	4
C2	Traffic convenience	[0.48, 0.68, 0.84]	0.667	6
C3	Convenient parking facilities	[0.47, 0.67, 0.83]	0.657	7
C4	Fast checkout	[0.56, 0.76, 0.9]	0.740	5
C5	Friendliness of salespeople	[0.61, 0.81 0.94]	0.787	3
C6	Merchandise quality	[0.62, 0.82, 0.95]	0.797	1
C7	Clean and comfortable atmosphere	[0.37, 0.56, 0.74]	0.557	9
C8	Well-ordered display	[0.38, 0.57, 0.75]	0.567	8
C9	Supermarket chain's image	[0.36, 0.55 0.74]	0.550	10
C10	A lot of promotional programs	[0.32, 0.52, 0.71]	0.517	12
C11	Competitive price	[0.62, 0.82, 0.95]	0.797	1
C12	Wide selection of products	[0.33, 0.52, 0.71]	0.520	11

An alternative supermarket chain with a closeness coefficient close to 1 has the shortest distance from the fuzzy positive ideal reference point, and the largest distance from the fuzzy negative ideal reference point. In other words, a large closeness coefficient of a supermarket chain indicates good performance. Table 8 shows the four supermarket chains in accordance with the closeness coefficients. Therefore, their ascending rank is substituted as follows: $CC_3 > CC_2 > CC_4 > CC_1$. That is, from customers perspective Saigon Co-op mart is the most competitive supermarket chain in Vietnam, the second is Big C, the third is Hapromart and the fourth is Metro Cash and Carry.

Conclusions and Recommendations

This study presents a scientific procedure to assess the competitiveness of supermarket chains by using triangular fuzzy numbers to express linguistic variables that consider the subjective judgments of evaluators and then adopting fuzzy multiple criteria decision making approach to synthesize the group decision. TOPSIS extended to a fuzzy environment is utilized to determine the rank of supermarket chains regarding their competitiveness. The importance weight ranking of the evaluation criteria demonstrates that Vietnamese customers are very concerned about competitive price, merchandise quality, and friendliness of salespeople when shopping at supermarkets. Moreover, the ranking of the four chosen supermarket chains reveals that from customers' perspective, Saigon Co-op mart (a Vietnamese brand) is the best performing supermarket chain recently; Big C (a foreign brand) ranks the second position; the third position in competitiveness belongs to Hapromart – a local modest supermarket chain and

Table 5: The fuzzy normalized decision matrix

	A1	A2	A3	A4
C1	[0.18, 0.36, 0.57]	[0.32, 0.52, 0.72]	[0.63, 0.85, 1]	[0.62, 0.84, 0.99]
C2	[0.36, 0.58, 0.81]	[0.41, 0.63, 0.85]	[0.57, 0.81, 1]	[0.57, 0.81, 0.99]
C3	[0.49, 0.75, 1]	[0.49, 0.75 1]	[0.44, 0.7, 0.95]	[0.32, 0.57, 0.83]
C4	[0.36, 0.62, 0.89]	[0.4, 0.66, 0.94]	[0.46, 0.74, 1]	[0.44, 0.71, 0.98]
C5	[0.38, 0.65, 0.93]	[0.45, 0.72, 0.99]	[0.43, 0.7, 0.97]	[0.45, 0.73, 1]
C6	[0.50, 0.77, 1]	[0.48, 0.74, 0.97]	[0.48, 0.73, 0.97]	[0.41, 0.66, 0.9]
C7	[0.49, 0.74, 0.96]	[0.54, 0.79, 1]	[0.45, 0.7, 0.92]	[0.38, 0.61, 0.85]
C8	[0.51, 0.75, 0.98]	[0.54, 0.78, 1]	[0.44, 0.68. 0.91]	[0.45, 0.69, 0.92]
C9	[0.53, 0.78, 1]	[0.46, 0.71, 0.94]	[0.47, 0.71, 0.94]	[0.46, 0.71, 0.94]
C10	[0.42, 0.67, 0.92]	[0.51, 0.76, 1]	[0.4, 0.65, 0.89]	[0.39, 0.64, 0.89]
C11	[0.54, 0.79, 1]	[0.47, 0.72, 0.95]	[0.47, 0.71, 0.94]	[0.44, 0.69, 0.92]
C12	[0.49, 0.75 1]	[0.48, 0.75, 1]	[0.48, 0.75, 1]	[0.45, 0.71, 0.97]

Table 6: The fuzzy weighted normalized decision matrix

	A1	A2	A3	A4
C1	[0.1, 0.28, 0.53]	[0.18, 0.4, 0.66]	[0.36, 0.66, 0.92]	[0.36, 0.65, 0.91]
C2	[0.17, 0.4, 0.68]	[0.2, 0.43, 0.72]	[0.28, 0.55, 0.84]	[0.27, 0.55, 0.83]
C3	[0.23, 0.5, 0.83]	[0.23, 0.5, 0.83]	[0.2, 0.47, 0.79]	[0.15, 0.38, 0.69]
C4	[0.21, 0.47, 0.81]	[0.23, 0.51, 0.85]	[0.26, 0.56, 0.91]	[0.25, 0.54, 0.89]
C5	[0.23, 0.52, 0.87]	[0.27, 0.58, 0.94]	[0.26, 0.57, 0.92]	[0.27, 0.59, 0.94]
C6	[0.32, 0.63, 0.95]	[0.3, 0.61, 0.93]	[0.3, 0.6, 0.92]	[0.26, 0.54, 0.86]
C7	[0.18, 0.41, 0.71]	[0.2, 0.44, 0.74]	[0.17, 0.39, 0.68]	[0.14, 0.34, 0.6]
C8	[0.19, 0.43, 0.74]	[0.2, 0.45, 0.75]	[0.17, 0.39, 0.69]	[0.17, 0.4, 0.69]
C9	[0.19, 0.43, 0.74]	[0.17, 0.39, 0.69]	[0.17, 0.39, 0.69]	[0.17, 0.39, 0.69]
C10	[0.14, 0.35, 0.65]	[0.16, 0.4, 0.71]	[0.13, 0.33, 0.63]	[0.13, 0.33, 0.63]
C11	[0.33, 0.65, 0.95]	[0.29, 0.59, 0.9]	[0.29, 0.58, 0.9]	[0.28, 0.57, 0.88]
C12	[0.16, 0.39, 0.71]	[0.16, 0.39, 0.71]	[0.16, 0.39, 0.71]	[0.15, 0.37, 0.69]

Table 7: The Distance measurement

	d_i^+	d_i^-
A1	6.9170	6.3269
A2	6.7396	6.5297
A3	6.5879	6.6970
A4	6.7746	6.4718

Table 8: Closeness coefficients

CC_1	CC_2	CC_3	CC_4
0.4777	0.4921	0.5041	0.4886

Metro Cash and Cary –a giant foreigner- ranks the lowest position.

This outcome partly corresponds to other experts' rankings of Vietnam retailing recently. For example, the latest list of 500 leading retailers in the Asia-Pacific region in 2009 announced by Singaporean magazine Retail Asia includes ten Vietnamese enterprises, in which

Saigon Co-op mart and Big C rank No.3 and No.5 respectively. The Ministry of Finance, Vietnam in 2009 also showed that among current players, Saigon Coop-mart has maintained its position as a market leader in market share, and Big C is No.2. The results found from TOPSIS also show that, even smaller in size, Vietnamese supermarket chains are still slightly higher in competitiveness in comparison to foreign chains. This outcome can be explained by the meeting of local chains to recent habit and taste of Vietnamese customers. Because of the traffic jam and habit of regular shopping

for daily food, beside competitive price and merchandise quality, Vietnamese customers often choose a supermarket located near their homes with traffic convenience and fast check-out that are competitive advantages of local chains recently.

Based on the findings from fuzzy TOPSIS and from selecting secondary data about Vietnam retailing, some recommendations for local and foreign supermarket chains in Vietnam are proposed as follows:

Suggestions for local supermarket chains

(1) The importance of co-operation and linkages: Even findings from TOPSIS show that local chains recently have more competitive advantages, however, in some main cities, many local supermarkets have lost to foreign chains because of lack of long-term business plans and strategies, lack of professional skills, limited finance, insufficient logistics and lack of co-operation between manufacturers, distributors and retailers. Therefore, it is important for local supermarket chains to build the co-operation and linkages among themselves to continue their competitive advantages in long term.

(2) The importance of co-operation among local supermarket chains with producers and manufactures which could ensure the quality of products: Taking advantage of having long term relationships with local producers and manufacturers, local supermarket chains should co-operate with them to satisfy Vietnamese customers' habits of buying cheap but high quality products. The co-operation among local supermarket chains with producers and manufactures is one way to localize displayed products in supermarkets that often lead to cheaper products' price. Furthermore, it is also a good way to ensure the quality of fresh products.

Suggestions for Foreign Supermarket Chains

(1)Understanding Vietnamese Business Law and ENT (Economic Need Test) is the key: Findings from secondary data about Vietnamese retailing show that foreign supermarket chains in Vietnam recently have ensured their competitive advantages in many aspects (e.g. managerial skills, sufficient capital, rich experiences); however, unclear and inconsistent Vietnamese Business Law, especially Economic Need Test is the most challenging task for all foreign supermarket chains. The Ho Chi Minh city's refusal of the proposal of Lotte Vietnam for the second store after the one in Saigon is still the typical lesson regarding this issue. Therefore, recruiting appropriate people who have deep knowledge about Vietnamese Business Law and having good

relationships with Vietnamese government officers is a recommendation for foreign chains when doing business in Vietnam.

(2)Taking advantage of preferential and special treatments for foreign supermarkets: 2009 marked an important milestone when Vietnamese retail market fully opened up under Vietnam's commitment to the WTO. It is also the right time for foreign supermarket chains to establish their business in a high growth market of double digits. Beside the opening market time, many cities and provinces in the country have offered preferential and special treatments for foreign supermarkets to attract giant retailers to invest in their place. Therefore, it is the right time for foreign supermarket chains entering or expanding their chains in Vietnamese market when competition among competitors is getting fiercer but still in the beginning period.

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