**Using Fuzzy TOPSIS Method for Assessing Competitiveness of Foreign and Local Supermarket Chains in Vietnamese Market**

|  |
| --- |
| **Do Thi Binh** |
| Dept. of Strategic Management, Vietnam University of Commerce  Tel: +84.989.956.957 |

**1 Introduction**

2009 marked as an important milestone for 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, FamilyMart) in the beginning of 2009 together with the existing foreign players (e.g METRO, Casino, Parkson, Bourbon, and Lotte groups and so forth) push Vietnam retail market to new period of development. Modern retail formats such as convenience stores, small shopping complexes, supermarkets, etc become more familiar for Vietnamese customers. Among them, supermarket chain is springing up and becoming dominant format in the country (Hong Nguyen, 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 more 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.op, the largest local supermarket chain in southern Vietnam expects to open other 20 stores in HCMC next year 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. All local chains, furthermore, are joining forces to better compete with their foreign rivals. Therefore, the competition between foreign and local supermarket chains becomes more intensive.

Considering the strategic importance for supermarket chains to understand 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 fuzzy TOPSIS method. Based on final results, areas, where improvements are required, are then identified 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 & Carry, Big C, Cora and Lotte Mart (foreign chains). To assess the competitiveness of foreign and local supermarket chains in Vietnam, well-known and representative supermarket chains are considered.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | **Metro** | **Big C** | **SG Co-op** | **Hapromart** |
| **C.O.O** | 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 m2 | 5,000 m2 | 3,500 m2 | 1,200 m2 |

**Table 1. Research Background** *(Collected from various sources)*

Two chosen foreign chains are Metro Cash & 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 - who has been awarded Top Vietnam Retailer and Asia Pacific Top 500 Retailer in 6 consecutive years and Hapromart – top retailer in northern Vietnam, who are dominating in Hanoi and some provinces nearby.

**2 Competitive Factors of Supermarket Chains in Vietnam**

From customers’ perspective, the concept of competitive factors of retail chain stores can be considered as determinants of retail patronage which idea includes such key concepts as store choice and frequency of visit (Yue Pan and George M. Zinkhan, 2006). Levy and Weitz (2009) suggested a retail strategy that included 6 important elements in the retail mix such as location, merchandise assortments, pricing, communication mix, store design and display, and customer service.

|  |  |
| --- | --- |
|  | **Evaluation criteria** |
| Location | C1. Home proximity |
| C2. Traffic convenience |
| Customer Service | C3. Convenient parking facilities |
| 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 |

**Table 2. Evaluation Criteria Used for Assessing Competitiveness of Supermarket Chains**

The retail mix includes the decision variables retailers use to satisfy customer needs and influence their purchase decision (Levy and Weitz’s, 2009), therefore it is useful for assessing competitiveness of supermarket chains. Considering Vietnamese customers’ habits and combining with Levy and Weitz’s suggestion, to this end, 12 evaluation criteriaare investigated as competitive factors for assessing supermarket chains’ competitiveness in Vietnam from customers’ perspective (Table 2).

1. ***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, 2009). 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 transport in Vietnam, it is also the most-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 have to pay attention to home proximity when deciding locations for their stores.

1. ***Traffic Convenience***

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

1. ***Convenient Parking Facilities***

The research of Food consumption in Hanoi and HCMC showed that 74.8% of Vietnamese consumers consider about parking facilities when they choose a supermarket for shopping (Agro Vietnam, 2008). This is especially true for an emerging market like 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 (Richard Leech, 2010). Having a convenient parking facility will ensure the competitiveness of retailers in Vietnamese market.

1. ***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% Vietnamese customers care about quick payment process when shopping (Agro Vietnam, 2008).

1. ***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 Pan and George M. Zinkhan, 2006). Friendliness of sales people is especially an importance competitive factor of supermarket chains in Vietnam regarding Vietnamese characteristics of being friendly and nice. 37.4% Vietnamese consumers consider about friendliness of salespeople when they choose a supermarket for shopping (Agro Vietnam, 2008).

1. ***Merchandise Quality***

A consumer’s perception of the quality of a store’s merchandise relates to the patronage of that store (Darley, William and Lim 1993). In brief, merchandise determines a retailer’s reputation and influences consumers’ choice at stores. In 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).

1. ***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 case of Vietnam, 56.9% customers agree that store’s cleanness and coolness is their first considerations when going shopping in supermarkets (Agro Vietnam, 2008).

1. ***Well-ordered Display***

As a major retailer descriptor, 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 store’s well-ordered display will attract them to a retail store and thus affect to store’s competitiveness (Agro Vietnam, 2008).

1. ***Supermarket Chain’s Image***

The impressions shoppers form of stores 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, social factors (Berry et al. 2002). In Vietnam, 54.9% Vietnamese consumers care about reputation of the supermarket when shopping (Agro Vietnam, 2008).

1. ***A lot of Promotional Programs***

Sales promotions are beneficial to retailers in several aspects. For example, they often used to trigger unplanned purchases (Michel 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 et al.1981). 31.9% Vietnamese consumers pay attention to promotional programs when shopping in supermarket (Agro Vietnam, 2008).

1. ***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 store’s competitiveness. This is especially true for an emerging market like Vietnam, where possesses a great purchasing power yet limited capital. Up to 97.4% Vietnamese customers say that they are interested in competitive price when choosing supermarket for shopping (Agro Vietnam, 2008).

1. ***Wide Selection of Products***

A wide selection 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.

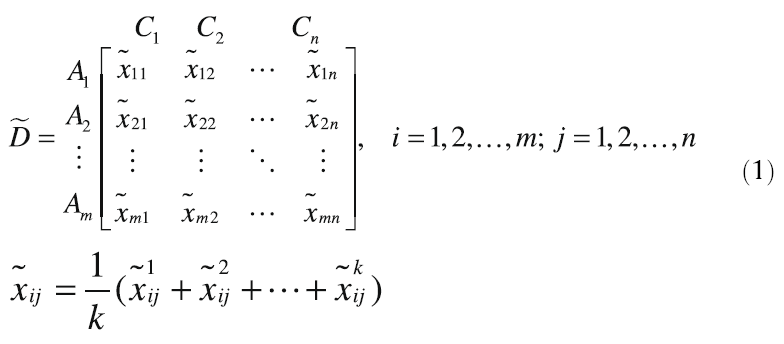
**3 The Fuzzy TOPSIS Method**

One of well-known classical Multi-Criteria Decision Making (MCDM) methods, 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 points 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; Wang and Chang, 2007; Wu, Tseng and Chen, 2009; etc..). 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 mathematics concept borrowed from Wang and Zhang (2005) as following:

Step 1: Determining the weighting of evaluation criteria.

The importance weights of various criteria and the ratings of qualitative criteria must be considered as linguistic variables.

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



where A1, A2, . . ., Am are the alternatives to be chosen; C1,C2, . . . ,Cn denote the evaluation criteria;  represents the rating of alternative Ai with respect to criterion Cj evaluated by k evaluators, and 

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 to be included in [0, 1]. The normalized fuzzy decision matrix denoted by  is calculated as following formula:

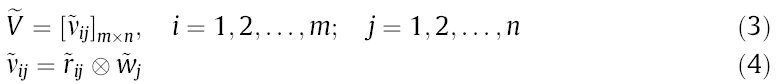
4

Then the normalization process can be performed as:

5

Step 4: Constructing weighted normalized fuzzy decision matrix.

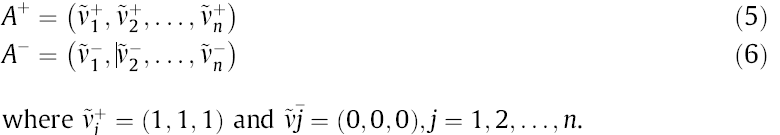
Considering the different weight of each criterion, the weighted normalized decision matrix can be computed by multiplying the importance weights of evaluation criteria and the values in the normalized fuzzy decision matrix as following:



where  represents the importance weight of criterion Cj.

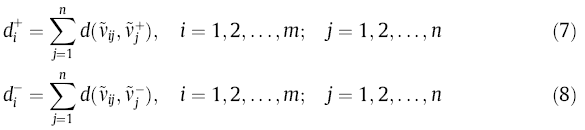
Step 5: Determining the FPIS and FNIS

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



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:



where  represents the distance measurement between two fuzzy numbers,  represents the distance of alternative Ai from FPIRP, and  denotes the distance of alternative Ai from FNIRP.

Step 7: Obtaining the closeness coefficient and ranking the alternatives.

When the di+ and di- of each alternative have been calculated, CCi is defined to determine the ranking order of all alternatives by calculating similarities to ideal solution:



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, Tseng and Chen (2009).

**4 Findings From The Fuzzy TOPSIS**

Hanoi and HCMC are chosen for 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. Total 500 samples were used in this study, in which 250 used for Hanoi and 250 used for HCMC from September 25th to October 17th, 2009. In 23 days of survey, there were 450 customers responded to our questionnaire. Thus response rate was 450/500 = 90%. Data after collected 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 following part.

Customers are requested to express their perceptions level of importance for each evaluation criterion in linguistic variables. An integrated fuzzy importance weight matrix for evaluation criteria is presented in Table 3.

**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] |

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.

**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** |

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 following: 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 selection 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 transform functions are utilized in this study (Table 5)

**Table 5: The fuzzy normalized decision matrix (R)**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | **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] |

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.

**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] |

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:





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.

|  |  |  |
| --- | --- | --- |
|  |  |  |
| A1 | 6.9170 | 6.3269 |
| A2 | 6.7396 | 6.5297 |
| A3 | 6.5879 | 6.6970 |
| A4 | 6.7746 | 6.4718 |

**Table 7: The Distance Measurement**

Once the distances of supermarket chains from FPIRP and FNIRP are determined, the closeness coefficient can be obtained and are shown in table 8.

**Table 8: Closeness Coefficient**

|  |  |  |  |
| --- | --- | --- | --- |
| CC1 | CC2 | CC3 | CC4 |
| 0.4777 | 0.4921 | 0.5041 | 0.4886 |

In which, the index CC1 for the first supermarket chain (Metro Cash & Carry), for example, is calculated as: 

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 coefficient. Therefore, their ascending rank is substituted as follows: CC3 > CC2 > CC4 > CC1.  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 & Carry.

**5 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 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 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; the annual industry report about retail market of 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 compare to foreign chains. This outcome can be explained by the meeting of local chains to recent habit and taste of Vietnamese customers. Because of traffic jam and habit of regular shopping for daily food, beside competitive price and merchandise quality, Vietnamese customers often choose a supermarket located near home with traffic convenience and fast check-out, that are competitive advantages of local chains recently.

Based on 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 following:

***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 loosen to foreign chains because of lacking 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, ensuring the quality of products.

Taking advantage of having long 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.

***For Foreign Supermarket Chains***

(1) Understanding Vietnamese Business Law and ENT is the key.

Findings from interviewing retail managers show that even though foreign supermarket chains in Vietnam have ensured their competitive advantages in many aspects (e.g. managerial skills, sufficient capital, rich experiences), unclear and inconsistent Vietnamese Business Law, especially ENT is the most challenge 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 as 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 invest in their place. Therefore, it is the right time for foreign supermarket chains enter to or expand their chains in Vietnamese market, where competition among competitors is getting piercer but still in the beginning period.

**REFERENCES**

*Agro Vietnam (2008).* Food consumption survey in Hanoi and Hochiminh city – facts and out looks, 11-60.

*Berry, Leonard, Kathleen Seiders and Dhruv Grewal (July, 2002).* “Understanding service convenience,” Journal of Marketing, 66, 1–17

*Blattberg, RC and Neslin, SA (1990).* Sales promotion: concepts, methods and strategies, Prentice-Hall, Engelwood Cliffs, NJ

*Darley, William K. and Jeen-Su Lim (1993).* “Store-choice behavior for pre-owned merchandise,” Journal of Business Research, 27, 17–31

*Dellaert, Benedict, Theo Arentze and Michel Bierlaire (1998).* “Investigating consumers’ tendency to combine multiple shopping purposes and destinations,” Journal of Marketing

*Finn, A. and J. Louviere (March, 1996).* “Shopping center image, consideration, and choice: anchor store contribution,” Journal of Business Research, 35, 241–251.

*Hong Nguyen(2009).* Viet News on 16th March, 2009

*Hwang, C. L., & Yoon, K. (1981).* Multiple attribute decision making methods and applications, a state-of-the-art survey. New York: Springer-Verlag.

*Koelemeijer, Kitty and Harmen Oppewal (1999).* “Assessing the effects of assortment and ambience: a choice experimental approach,” Journal of Retailing, 75 (3), 319–345

*Lambert, Z.V. (1979).* “An investigation of older consumers: unmet needs and wants at the retail level,” Journal of Retailing, 55 (4), 37–57

*Levy and Weitz (2009).* Retailing Management, McGraw-Hill/Irwin Publisher, July 2009.

*Michel Laroche, Frank Pons, Nadia Zgolli, Marie-Cécile Cervellon, Chankon Kim (2003).* A model of consumer response to two retail sales promotion techniques. Journal of Business Research, 56(7), 513-522.

*Mulhern, FJ and Padgett, DT (1995).* The relationship between retail price promotions and regular price purchases. J Mark, 59(4), 83–90.

*Richard Leech (2010).* Vietnam retail property market: Supply, Demand & Pipeline projects. CB Richard Ellis Report, 27th January, 2010.

*Walters, RG and Rinne, HJ, 1986.* An empirical investigation into the impact of price promotions on retail store performance. J Retailing,**62**, 237–266.

*Wang, J., Liu, S. Y., & Zhang, J. (2005).* An extension of TOPSIS for fuzzy MCDM based on vague set theory. Journal of Systems Science and Systems Engineering, 14(1), 73–84.

|  |
| --- |
| *Yue Pan, George M. Zinkhan (2006).* Determinants of retail patronage: A meta-analytical perspective, Journal of Retailing, 82(3), 2006, 229-243. |