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Developing and Implementing a Selection Model for Bedding Chain Retail Store Franchisee Using Delphi and Fuzzy AHP

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Abstract. This work presents a Fuzzy Analytic Hierarchy Process (Fuzzy AHP) model that adopts several important criteria. A questionnaire based on selection criteria identified from pertinent literature and interviews with experts is designed using the modified Delphi Technique and then sent to experts and decision makers. Major selection criteria are then analyzed and ranked using Fuzzy AHP. The proposed selection model not only enables a franchiser to select franchisees more objectively, but also be apply to other brand bedding company chain stores, thus enhancing commercial operations.

Key words: chain retail store, franchising, bedding, Delphi, fuzzy analytic hierarchy process.

1. Introduction

As an important business model, chain retail stores take the form of either a regular or a franchise store. However, franchising has been a prominent means of selling a wide array of products and services (Kotler, 2003). A chain retail store extends the franchisee not only by decreasing overhead costs, but also by achieving economies of scale efficiently, as convenient stores and pharmacies are common examples of franchising corporations; but too many franchise stores negatively impact the generated revenues of other the same brand franchisees belonging to the same corporation. Importantly, a franchiser must limit its number of expanded stores in a specific area to secure stable revenues for existing franchisees and economize its use of corporate operating resources. However, franchisers lack an objective means of selecting the most promising franchisees desiring to join the chain retail store.

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According to Frazer (2001) study, franchisees did not expend adequate effort in operating their businesses in general, indicating the need for greater care in selecting franchisees and greater incentives for franchisees to perform at a desirable level. Furthermore, store location of the franchisee is also an important evaluation factor. Most studies focus mainly on convenient retail stores and the fast food sector et al. Houston and Stanton (1984) evaluated retail trade areas for convenience stores; Bainbridge (2000) analyzed the market and Mendes and Themido (2004) assessed the convenience retail store site location; Krueger (1991) indicated the fast food franchising ownership, agency and wages, Kara et al. (1995) presented consumers perceptions of and preferences for fast-food restaurants in the USA and Canada, and Jambulingam and Nevin (1999) examined the relationship between key franchisee selection criteria and key measures of outcomes desired by franchisors. Owing to the lack of research in other durable-oriented sectors such as bedding chain retail stores. Although above studies prioritized the selection of store location and reliable franchisee, to our knowledge, no study has developed a selection model for franchisees with respect to store location.

Selecting a bedding chain retail store franchisee is a multi-criteria decision-making problem, in which the most promising franchisee requires appropriate criteria and strict screening, as well as use of Analytic Hierarchy Process (AHP) approach. This method incorporates the assessments of all decision-makers into a final decision, without having to elicit their utility functions on subjective and objective criteria, via pair-wise comparisons of the alternatives (Saaty, 1990). However, AHP is ineffective when applied to ambiguous problems, explaining why Buckley (1985) extended hierarchical analysis to study where the participants are allowed to employ fuzzy ratio in place of exact ratios. Additionally, Hsu (1999) integrated AHP and Fuzzy Delphi method to develop a Fuzzy Delphi analytic hierarchy process. Later, Kuo et al. (2002) adopted Fuzzy AHP to select the location of convenience stores. More recently, Hsu (2004) applied Fuzzy AHP for selecting an ideal Internet advertising network. This study adopts the Fuzzy AHP based on the earlier concepts of Buckley (1985) and Hsu (1999) in order to develop a bedding chain retail store franchisee selection model and analyze data. This method not only adopts several important score criteria, but also enables franchisers to include their most important desired characteristics for a potential franchisee in the selection criteria. A questionnaire based on selection criteria identified from pertinent literature and interviews with experts is designed using modified Delphi Technique and then sent to experts and decision-makers. Next, Fuzzy AHP is used for a fuzzy positive reciprocal matrix of the criteria on an important scale, with those results used to analyze and rank major selection criteria. Scores of each franchisee are counted, with the highest one selected. Analysis results indicate that the proposed selection model enables franchiser to execute choice franchisee more objectively by allowing them to operate effectively. The proposed model is also applied to other brand bedding retailing company, subsequently enhancing their business operations.

2. Method

The methods consists of the modified Delphi Technique and Fuzzy AHP, as stated below.

2.1. MODIFIED DELPHI TECHNIQUE

The Delphi Technique is a conventionally adopted qualitative forecasting method (Anderson et al., 2001), which involves the systematic solicitation and collation of experts on a particular topic through a set of carefully designed sequential questionnaires interspersed with summarized information and feedback of opinions derived from earlier responses (Delbecq et al., 1975). Originally developed by a research group at the Rand Corporation, Delphi Technique attempts to forecast current trends through a group consensus. Moreover, experts are anonymous and do not meet each other in person. Dijk (1986) indicated the Delphi Technique is a suitable communicative technique on the subjective base of norms and opinions for social research. Dijk (1989) adopted Delphi to solve the problem of introduce a largely scale automation of commercial bank work. Chaw (2001) applied the Delphi to select procurement systems for construction projects.

Murry and Hammons (1995) modified the traditional Delphi Technique by eliminate the first-round questionnaire containing unstructured questions. Besides saving time and expenses, a structured questionnaire allows the panel to immediately focus on the study issues. Therefore, this study adopts the modified Delphi Technique based on results of literature review and interviews with experts to select the probably criteria. Although between 5 and 20 experts should be used in experts forecasting (Anderson et al., 2001), group size influences the effectiveness of group decision-making. Therefore, the decision-making group probably should not be too large, i.e. a minimum of 5 to a maximum of about 50 (Robbins, 1994), the Delphi Technique work group of five to nine members (Delbecq et al., 1975). Therefore, this study invited nine experts to participate in the modified Delphi Technique group.

2.2. FUZZY ANALYTIC HIERARCHY PROCESS (FUZZY AHP)

AHP was developed in the early 1970s in response to military contingency planning, scarce resources allocation and the need for political participation in disarmament agreements, and AHP not only a decision method that decomposes a complex multi-criteria decision problem into a hierarchy but also a measurement theory that prioritizes the hierarchy and consistency of the judgmental data provided by a group of decision-makers (Satty, 1980). However, the AHP method could only be use to evaluate the definite alternatives in multi-criteria decision-making problems as in the Equation (1) by using the positive reciprocal matrix.

Let $C1, C2, \ldots, Cn$ be the set of criteria, while a_{ij} represents a quantified judgment on a pair of criteria C_i, C_j. The relative importance of two criteria is rated using a scale with the digits 1, 3, 5, 7, and 9, where 1 denotes "equally important", 3 for "slightly more important", 5 for "strongly more important", 7 for "demonstrably more important" and 9 for "absolutely more important". The digits 2, 4, 6 and 8 are used to facilitate a compromise between slightly differing judgments. A n-by-n matrix A is derived as follows:

$$A = [a_{ij}] = \begin{array}{c} \\ C_1 \\ C_2 \\ \vdots \\ C_n \end{array} \begin{array}{c} \begin{array}{cccc} C_1 & C_2 & \ldots & C_n \end{array} \\ \begin{bmatrix} 1 & a_{12} & \ldots & a_{1n} \\ 1/a_{12} & 1 & \ldots & a_{2n} \\ \vdots & \vdots & \ddots & \vdots \\ 1/a_{1n} & 1/a_{2n} & \ldots & 1 \end{bmatrix} \end{array} \quad (1)$$

where $a_{ij} = 1$ and $a_{ji} = 1/a_{ij}, i, j = 1, 2, \ldots, n$.

In matrix A, the problem involves assigning a set of numerical weights $W_1, W_2, \ldots, W_n$ to the n criteria $C_1, C_2, \ldots, C_n$ that "reflects the recorded judgments". If A is a consistency matrix, the relations between weights W_i and judgments a_{ij} are simply given by $W_i/W_j = a_{ij}$ (for $i, j = 1, 2, \ldots, n$).

The Fuzzy AHP substitutes the specific for a_{ij} with triangular fuzzy number $\tilde{a}_{ij}$, implying that triangular fuzzy numbers replace the judgments on pair-wise comparison matrix to set the criteria and determine the fuzzy consensus problem among experts. Different α-cuts are then converted into specific figures, after which, the eigenvector method is used for calculating the weights. The relative weights of the elements of each level are calculated as follows:

(1) Establish the triangular fuzzy numbers

This study uses geometric mean (which represents the consensus of experts) as the mode for triangular fuzzy numbers that is the mean of membership equals to 1. Where γ_{ij} denotes the maximum numerical value for a consensus among experts, and α_{ij} is the minimum numerical value, while δ_{ij} is the geometric mean, which represents the consensus of most experts. Therefore, the values within γ_{ij} to α_{ij} represent the possibilities for different consensuses. Figure 1 illustrates the concept.

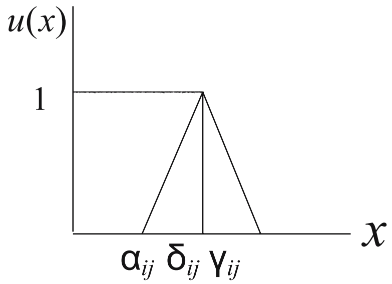

Figure 1. Triangular fuzzy numbers.

Fuzzy numbers should be used to consolidate fragmented expert opinions since each number in the positive reciprocal matrix represents the subjective opinion of decision makers and is an ambiguous concept. The triangular fuzzy numbers a_{ij} are established as follows:

$$\tilde{a}_{ij=(}\alpha_{ij}, \delta_{ij}, \gamma_{ij}) \tag{2}$$

$$\alpha_{ij} \le \delta_{ij} \le \gamma_{ij}, \text{ and } \alpha_{ij}, \delta_{ij}, \gamma_{ij} \in [1/9, 1] \cup [1, 9]$$

$$\alpha_{ij} = \min(B_{ijk}) \tag{3}$$

$$\delta_{ij} = \sqrt[n]{\prod_{k=1}^{n} B_{ijk}} \tag{4}$$

$$r_{ij} = \max(B_{ijk}) \tag{5}$$

where B_{ijk} represents a judgment of expert kth for the relative importance of two criteria i, j.

(2) Establish the fuzzy positive reciprocal matrix

$$[\tilde{A}] = [\tilde{a}_{ij}] = \begin{matrix} & C_1 & C_2 & \dots & C_n \\ C_1 & 1 & \tilde{a}_{12} & \dots & \tilde{a}_{1n} \\ C_2 & 1/\tilde{a}_{12} & 1 & \dots & \tilde{a}_{2n} \\ \vdots & \vdots & \vdots & \ddots & \vdots \\ C_n & 1/\tilde{a}_{1n} & 1/\tilde{a}_{2n} & \dots & 1 \end{matrix} \tag{6}$$

where $\tilde{a}_{12}$ denotes a triangular fuzzy positive reciprocal matrix for the relative importance of two criteria C_1 and C_2, and $[\tilde{a}_{ij}]$ represents the triangular fuzzy numbers by the Equations (2)–(5).

(3) Calculating fuzzy weights

The geometric mean $\tilde{Z}_i$ for each row is determined

$$\tilde{Z}_i = [\tilde{a}_{ij} \otimes \cdots \tilde{a}_{in}]^{1/n}, \ \forall i \tag{7}$$

and the fuzzy weight $\tilde{W}_i$ is given

$$\tilde{W}_i = \tilde{Z}_i \otimes \left(\tilde{Z}_i \oplus \cdots \tilde{Z}_n\right)^{-1} \tag{8}$$

(4) Consistency test

Saaty (1980) proposed utilizing consistency index (CI) and consistency ratio (CR) to verify the consistency of the comparison matrix. Additionally, CI and CR are defined as follows:

$$\mathrm{CI} = (\lambda_{\max} - n)/(n-1) \tag{9}$$

$$\mathrm{CR} = \mathrm{CI/RI} \tag{10}$$

where RI denotes the average consistency index over numerous random entries of same order reciprocal matrices. If $\mathrm{CR} \leq 0.1$, the estimate is accepted; otherwise, a new comparison matrix is solicited until $\mathrm{CR} \leq 0.1$.

(5) Calculating fuzzy scores

The final fuzzy score $\tilde{S}_i$ of alternative A_i is obtained from

$$\tilde{S}_i = \left(\tilde{r}_{i1} \otimes \tilde{W}_1\right) \oplus \cdots \oplus \left(\tilde{r}_{iK} \otimes \tilde{W}_K\right) \tag{11}$$

(6) Defuzzification

While various methods are available for defuzzification, this study adopts Equation (12) to calculate the final fuzzy score. This method can clearly express the fuzzy perception of experts and decision-makers owing to its ability to simulate the predictions of decision-makers and various decision environments

$$S_i^{\alpha} = \lambda S_{il}^{\alpha} + (1-\lambda) \cdot S_{iu}^{\alpha}$$

$$\tilde{S}_i = (S_{il}, S_{im}, S_{iu})$$

$$S_{il}^{\alpha} = (S_{im} - S_{il}) \times \alpha + S_{il}$$

$$S_{iu}^{\alpha} = -(S_{iu} - S_{im}) \times \alpha + S_{iu}$$

$$0 \leqq \alpha \leqq 1, \quad 0 \leqq \lambda \leqq 1 \tag{12}$$

where α can be viewed as either a stable or fluctuating condition, the range of uncertainty is greatest when $\alpha = 0$. Meanwhile, the decision-making environment stabilizes with an increasing α while, simultaneously, the variance for decision-making decreases, where α can be any number between 0 and 1. To facilitate analysis, the following 11 numbers, $0, 0.1, 0.2 \ldots 1$ are for uncertainty simulation. Besides, while $\alpha = 0$ represents the upper-bound γ_{ij} and lower-bound α_{ij} of triangular fuzzy numbers, and while $\alpha = 1$ represents the geometric mean δ_{ij} in triangular fuzzy numbers. Notably, λ can be viewed as the degree of pessimism among decision makers. When $\lambda = 1$, the decision-makers are pessimistic, and the lower-bound α_{ij} of the triangular fuzzy number is given. Although λ could be any number from 0 to 1, 11 numbers, i.e., 0, 0.1, 0.2...1, are used to simulate the state of mind of decision-makers.

(7) Normalization

The alternatives are compared with the same α-cuts level by adopting Equation (13) to normalization. Sensitivity analysis is then performed:

$$S_{i*}^{\alpha} = S_i^{\alpha} / \sum S_i^{\alpha} \tag{13}$$

3. Model

This work presents a franchisee selection model for when a franchise-bedding company extends its number of business units and selects the best franchisee with store location. Data obtained from the franchisee selection model for this study involved collecting interview responses from chain bedding field experts and three bedding company's managers. First, nine experts were gathered to form a panel and, then, the modified Delphi Technique was used to define the evaluative criteria and establish a hierarchical model with franchisee selection. Next, the criteria weights were scored based on Fuzzy AHP questionnaire results, with the final step involving decision-makers scoring the three franchisees to select the best performing franchisee in order to verify selection model effectiveness. Figure 2 illustrates the research framework of this study in which the modified Delphi Technique and Fuzzy AHP are adopted in two stages

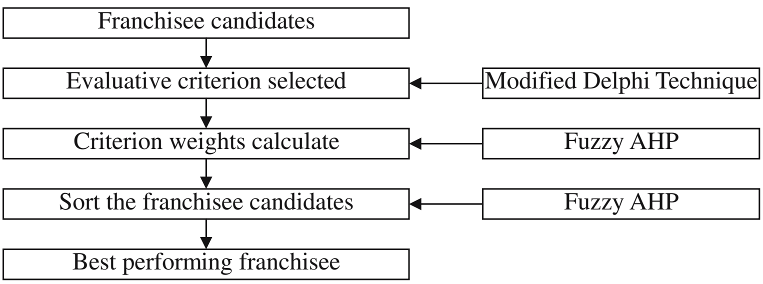

Figure 2. Research framework.

Step 1: Define the evaluative criteria of the bedding chain retail store franchisee.
Step 2: Establish a hierarchy structure for several levels with interrelated decision criteria.
Step 3: Establish the triangular fuzzy numbers using Equations (2)–(5) and, then, establish the triangular fuzzy positive reciprocal matrix using Equation (6). Each expert makes a pair-wise comparison of the decision criteria and gives relative scores. Additionally, each decision maker gives the franchisee scores under the criterion.
Step 4: Calculate the fuzzy weights for the criteria using Equations (7) and (8).
Step 5: Test the consistency of each comparison matrix by Equations (9) and (10).
Step 6: Obtain the final fuzzy score for alternatives from Equation (11).
Step 7: Perform defuzzification and use Equation (12).
Step 8: Use Equation (13) for normalization, and then, perform the sensitivity analysis.

4. Application

This study establishes and demonstrates the effectiveness of a bedding chain retail store franchisee selection model. The case study involves a well-known franchise-bedding company in Taiwan that will extend its number of business units in 2006. However, this company lacks an objective means of selecting the most promising franchisees desiring to join the chain retail store. Thus, a decision-maker group for franchisee selection is organized, comprising three of the following decision-makers: chief executive officer, marketing director and business manager. This study selected the criteria identified from pertinent literature and interviews with experts. Nine experts participated in a group that adopted the modified Delphi Technique. The questionnaire was sent using E-mail; the evaluation criteria was defined; the final criteria was extracted in which a score of four on the Likert 5-point scale must be achieved; and the results were collected after passing through two rounds of using the modified Delphi Technique.

Based on results of the modified Delphi technique, each level criteria is listed below:

1. Personal condition: three sub-criteria of personal background, financial situation and business ability.
   (a) Personal background: five sub-sub-criteria of educational level, sector seniority (e.g., years of professional experience in the bedding or furniture sector), age, social intercourse and personal characteristics.

   (b) Financial situation: two sub-sub-criteria of financial capability and store size.
   (c) Business ability: four sub-sub-criteria of identify with franchiser system strategy and characteristics of products, operating experience and professional knowledge and harmonious relation with franchiser to fulfill planning and selling/marketing ability.
2. Location condition: three sub-criteria of area/location, traffic and consumer.
   (a) Area/location: five sub-sub-criteria of gregarious market (e.g., proximity to furniture stores or wedding dress shops), protected area coverage (e.g., at a distance from the same brand chain retail store), level of competition (proximity of other brand stores), store visibility (effect on billboard advertising) and area type (e.g., business or residential area).
   (b) Traffic: three sub-sub-criteria of parking convenience, public transportation and level of traffic flow.
   (c) Consumer: four sub-sub-criteria of area population, features of area population (e.g., average age, occupation and educational level), consumer purchasing power and individuals passing by.

The hierarchy structure includes 5 levels with interrelated decision criteria: level one is the top goal, selecting the most promising bedding chain retail store franchisee; level two includes two evaluation criteria; level three is sex sub-criteria; level four is 23 sub-sub-criteria; finally, level five is the alternative 3 franchisee candidates. Figure 3 illustrates the Fuzzy AHP model used in this study. Regarding criteria weights and ranking, this study uses the $\alpha = 0.5$ and $\lambda = 0.5$ to calculate weights.

Table I lists the results. According to this table, under the top goal, the weights obtained sequentially through two criteria are personal condition (0.6292) and store location (0.3708). Under the personal condition criterion, the business ability criterion weight (0.4542) is higher than the personal background (0.3038) and financial situation (0.242); the area/location (0.5090) is higher than consumer criterion weight (0.2910) and traffic (0.2001) under the store location criterion. In the level four, under the personal background, the sub-criterion weight (0.2957) of the personal characteristics is higher than educational level (0.2059), social intercourse (0.1979), sector seniority (0.1817) and age (0.1189); under the financial situation, criterion weight of the store size (0.5936) is higher than that of the financial capability (0.4064); under the business ability sub-criterion, the selling/marketing ability sub-sub-criterion (0.3502) is higher than experience and knowledge (0.2511), identification with the franchiser and products characteristics (0.2319) and harmonious relation with franchiser (0.1668); under the area/location, the highest score is 0.3512 for gregarious

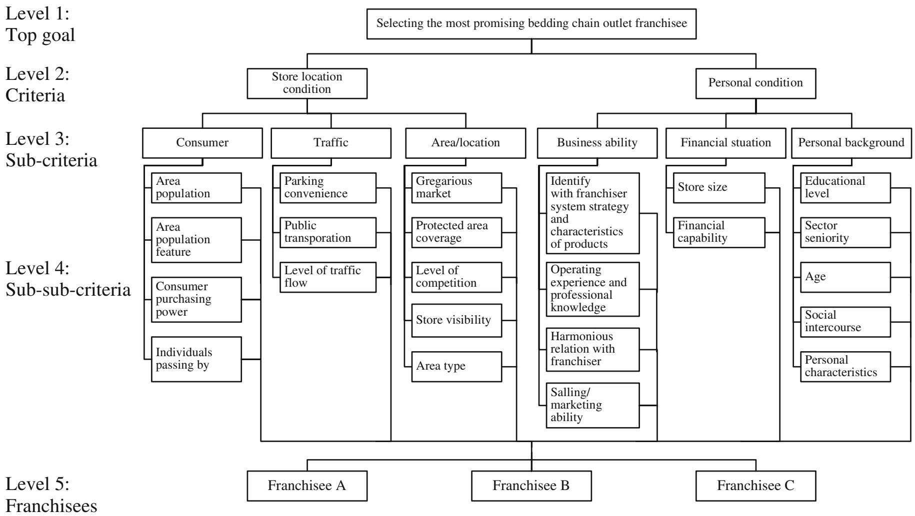

Figure 3. Hierarchical structure for select the most promising bedding chain retail store franchisee.

market, in followed are protected area coverage (0.2135), level of competition (0.1840), store visibility (0.1651), and the least is area type (0.0862); under traffic sub-criterion, parking convenience weight (0.5901) is the highest, the public transportation (0.2493) is higher than level of traffic flow (0.1606); finally, under the consumer sub-criterion, consumer purchasing power (0.4507) is higher than features of area population (0.2156), area population (0.2100) and individuals passing by (0.1236). Among all of the twenty-three sub-sub-criteria, the 10 important criteria of the list are selling/marketing ability (0.1001), store size (0.0904), experience and knowledge (0.0718), identify with franchiser system strategy and characteristics of products (0.0663), gregarious market (0.0663), financial capability (0.0663), personal characteristics (0.0565), consumer purchasing power (0.0486), harmony with franchiser (0.0477) and parking convenience (0.0438). This study calculates CI and CR. Results of the consistency test, CR of the comparison matrix from each of the nine experts and three decision-makers are all smaller than 0.1, indicating consistency with experts and decision-maker's judgment. Furthermore, CR of the aggregate matrix is also below 0.1, indicating consistency with expert's judgment.

The final fuzzy scores are calculated by defuzzification, normalization and sensitivity analysis. $\alpha(0, 0.1, \ldots, 1)$ is combined with $\lambda(0, 0.1, \ldots, 1)$ to sum up the three franchisees rankings. According to our results, when $\lambda =$ 0, 0.5 and 1, the franchisee is the promising one in different α-cuts level $(0, 0.1\ldots, 1)$. According to Figures 4–6, when $\lambda = 1$ and $\alpha = 0$, Franchisee B is the best one. Next, simulation results of 121 situations indicate that

Table I. Each level of criteria weights

Criteria	Criteria weights	Sub-criteria	Sub-criteria weights	Sub- criteria weights of overall levels	Sub-sub-criterion	Sub- sub-criteria weights	Sub- sub-criteria weights of overall levels
		Personal background	0.3038	0.1912	Educational level	0.2059	0.0394
					Sector seniority	0.1817	0.0347
					Age	0.1189	0.0227
					Social intercourse	0.1979	0.0378
					Personal characteristics	0.2957	**0.0565**
Personal condition	0.6292	Financial situation	0.2420	0.1523	**Store size**	0.5936	**0.0904**
					Financial capability	0.4064	**0.0619**
		Business ability	0.4542	0.2858	**Identify with franchiser and products**	0.2319	**0.0663**
					Experience and knowledge	0.2511	**0.0718**
					Harmonious relation with franchiser	0.1668	**0.0477**
					Selling/marketing ability	0.3502	**0.1001**
		Area/location	0.5090	0.1887	Gregarious market	0.3512	**0.0663**
					Protected area coverage	0.2135	0.0403
					Level of competition	0.1840	0.0347
					Store visibility	0.1651	0.0312
					Area type	0.0862	0.0163

Table I. (Continued)

Criteria	Criteria weights	Sub-criteria	Sub- criteria weights	Sub- criteria weights of overall levels	Sub-sub-criterion	Sub- sub- criteria weights	Sub- sub- criteria weights of overall levels
Store location	0.3708	Traffic	0.2001	0.0742	**Parking convenience**	0.5901	**0.0438**
					Public transportation	0.2493	0.0185
					Level of traffic flow	0.1606	0.0119
		Consumer	0.2910	0.1079	Area population	0.2100	0.0227
					Features of area population	0.2156	0.0233
					Consumer purchasing power	0.4507	**0.0486**
					Individuals passing by	0.1236	0.0133

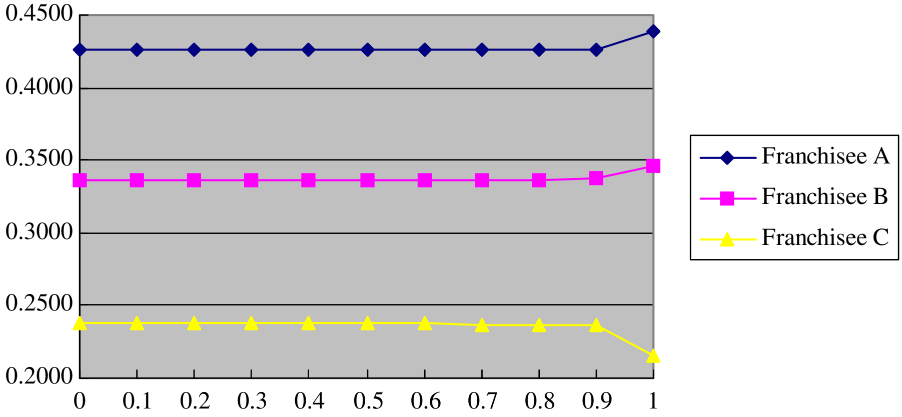

Figure 4. $\lambda = 0$ sensitivity analysis.

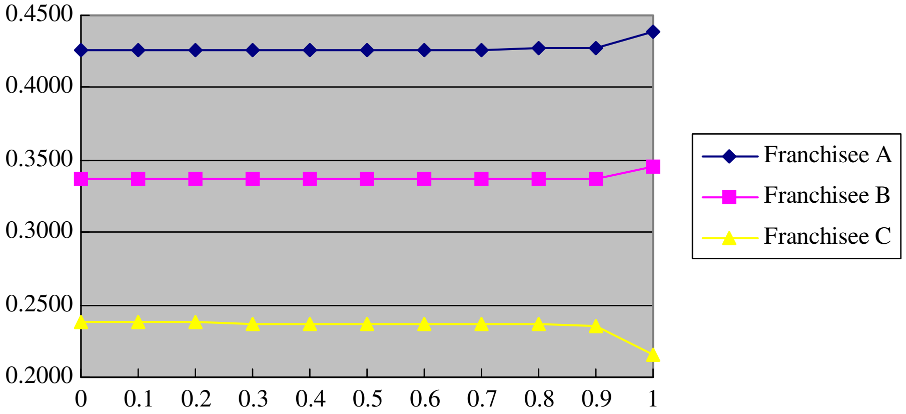

Figure 5. $\lambda = 0.5$ sensitivity analysis.

Franchisee A is the promising one in 120 situations. Only a situation in which $\lambda = 1$ (decision-makers foresee in the future is pessimistic) and $\alpha = 0$ (consider the decision-making environment is uncertain) demonstrates that Franchisee B is the promising one.

In summing up the above results, Franchisee A is the most promising bedding chain retail store. According to data from franchise-bedding companies, the average monthly business volume of three franchisees is around $US400,000, 300,000 and 250,000, therefore, above data demonstrates the effectiveness of the proposed model in selecting the most promising bedding chain retail store franchisee.

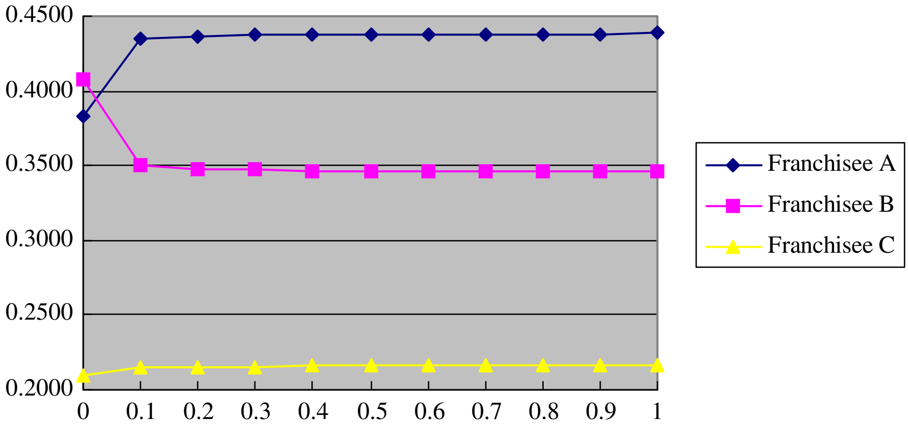

Figure 6. λ=1 sensitivity analysis.

5. Discussion

This study has demonstrated that the bedding sector in Taiwan emphasizes the condition of a franchisee personal condition more than its store location. Among all of the 23 sub-sub-criteria, sales/marketing ability is the most important one. On the other hand, based on the criteria that determine store location, Area/location criterion is the most significant in the sub-criteria level, and the consumer related criterion is more important than traffic criterion. This finding differs from that of Kuo et al. (2002), which suggested that population domain is the least of all of six criteria to consider the convenience store location; and Tzeng et al. (2002) indicated that transportation criterion is most important to select a restaurant location. This is likely owing to that bedding chain retail stores attach great importance to brand quality. Therefore, not only high quality durable goods but also more expensive ones explain why the experts emphasize area/location and consumer criteria. Given that the franchising in this study belongs to the bedding sector, stores sell durable goods, in which an important degree of location in the evaluate criteria differs from other chain retail stores that sell non-durable goods, e.g. convenience stores. However, results of this study provide an objective means of evaluating the viability of franchisees.

We conjecture why Franchisee B is the most promising one. If the future is pessimistic and a decision-making environment is uncertain, decision-makers stress operating conservatively. Under this circumstance, financial capability, store size, parking convenience, consumer-purchasing power and selling/marketing ability are more important. Of three criteria for financial capability, store size and consumer-purchasing power, Franchisee B scores the highest and becomes the best selection. Therefore, the promising one changes from Franchisee A to Franchisee B.

Although selling/marketing ability is most important criterion originally, when the future is pessimistic and a decision-making environment is uncertain, this criterion does not maintain the most important one.

Although performing optimally among the three franchisees in 121 situations, Franchisee A does not receive the highest score in each criterion. The fuzzy weights of those criteria vary in the most promising franchisee selection Fuzzy AHP model, therefore, if franchisee performs slightly better than the other two franchisees in more important criteria in which the selection model is emphasized, this franchisee may hold an advantage over other ones.

6. Conclusion

This work presents a fuzzy selection model for a bedding chain franchisee from the perspective of franchisers. Analytical results indicate that the bedding franchisees are ranked in the following order of desirability: Franchisee A, Franchisee B and Franchisee C. Consequently, Franchisee A is selected as the ideal franchisee. The selection model ranks the importance that franchisers hold for various criteria used to compare the desirability of different franchisees based on store location factors and franchisee personal factors. The proposed model provides an objective and effective decision model for franchisers to implement when selecting bedding chain franchisees. Future research should focus on establishing a selection model to compare the similarities and dissimilarities in selling non-durable goods with a durable goods chain retail store.

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