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Research Article

Formulating an Optimal Strategic Marketing Model by Integrating SWOT and FUZZY

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Abstract: This study is an applied research and an analytic-descriptive one in terms of nature. By identifying SWOT matrix factors in Parsian Bank through using fuzzy logic, the present study seeks to determine proper strategy in one of the strategic calculated zones in the matrix of strategy determination and the most appropriate strategy for Parsian Bank. This study has applied Cronbach's Alpha method to determine reliability. Having identified strengths and weaknesses, opportunities and threats and prioritized them by FAHP method, the results revealed that the optimal strategic zone in marketing would be an offensive strategy, in accordance of which several strategies have been suggested to the Bank.

Keywords: Fuzzy hierarchy analysis, marketing strategy, Persian Bank SWOT matrix

INTRODUCTION

Nowadays most organizations are spending considerable time, energy and resources for the evaluation of their performances in order to achieve the specified strategic goals. Yet studies suggest that traditional systems of performance evaluation are not consistent with the governing circumstances and with value-creating mechanisms in modern organizations and they are not able to evaluate the value accruing from intangible assets such as employees' knowledge, organization relationship with customers and suppliers and innovative cultures. Strategy indicates future direction and path of a part of organization or the whole one. Strategy has been defined as the organization direction and scope of activities in a long term period that results in achieving advantages by the organization through fulfilling customers' needs and shareholders expectations (Kaplan and Norton, 2007). Companies found out that attaining reputation and credit is so difficult and losing them is so easy. Introspective companies loose individual insight and cognition regarding rapid developments of market, competitors, collective media distribution systems and new technologies occurring outdoors. Competition is the source of prosperity and failure of the firm. Thus firms must organize their activities in accordance with competitive conditions and enterprises have to formulate strategies to organize their activities (Hech, 2006). Formulating and communicating strategic perspective and objectives of information technology is one of the key factors of strategy processing model, as strategies specify how to achieve objectives and perspective and success of the strategy can be estimated by being compared with objectives and perspective (Stisy, 2005). Nowadays most organizations are spending considerable time, energy and resources for the evaluation of their performances in order to achieve the specified strategic goals. Yet studies suggest that traditional performance evaluation systems are not consistent with the governing circumstances and value-creating mechanisms in modern organizations and they are not able to evaluate the value accruing from intangible assets such as employees' knowledge, organization relationship with customers and suppliers and innovative cultures (Banker *et al*., 2004).

In the current circumstances of business in which the market of banks activities are changing extensively and swiftly and awareness and expectations of the customers on one hand and banks competition intensity on the other hand are increasing, sustainability and success have been converted to the managers main concern. Having accelerated the trend of transferring state-owned banks by virtue of the general policies of Article 44 of the Constitution Law, getting more serious about implementation of the government economic development plan in banking sector and through salient development of private banks and increase of their market share and customers, competition arena has been tightened for the banks and the necessity of undertaking specific measures so as having a successful presence in the market has further been revealed. If we consider bank strategic planning as comprising the stages of creating strategic thoughts and culture and formulating strategic plan consisting of strategy design in three levels of the whole bank, bank departments or affairs and bank tasks, then marketing in the sense of

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mass marketing has a significant position in all stages of strategic planning.

SWOT (strengths, weaknesses, opportunities and threats) method is an important tool to support decision making and it is usually applied as a means of systematic analysis of the organization internal and external environments (Kotler, 1988; Kurttila *et al*., 2000). Having identified strengths, weaknesses, opportunities and threats, the organizations apply their strengths, remove their weaknesses, utilize their opportunities and cope with the threats through formulating strategies (Kangas *et al*., 2003).

This study aims at formulating an optimal strategic marketing model by SWOT method and identifying strengths, opportunities, weaknesses and threats and prioritizing them via fuzzy method and it considers banking industry and Parsian Private Bank as the study sample.

THEORETICAL BASICS AND RESEARCH BACKGROUND

In this section, theoretical basics comprising strategy major basics and definitions and research background including research of previous scholars regarding the present study subject are respectively presented.

Theoretical basics: Recognizing main opportunities and focus of human recourses are consistent with realizing benefits lying in that. Opportunities are the main components of strategic move without which strategy is a meaningless matter. Opportunities have an inner potential benefit; the more this benefit is, the more the opportunity value will be. Through discovering this opportunity and applying organizational capabilities, strategy realizes the given potential benefit and provides the organization with it. Strategy means struggle for perception of the fact that in today world what position we allocate to ourselves and not addressing this matter that what position we wish to occupy, instead we must consider where we will reach (Torkashvand, 2002). Strategic management is defined as art and science of formulating, implementing and evaluating multi task decisions which enables the organization to achieve its long term objectives (Shahi, 2004).

- Management statement of an organization is a document that distinguishes that enterprise from other enterprises. An enterprise or an organization mission represents its scope of activity. Mission makes the strategists ponder about nature and scope of activities and determine the future path of the organization (Ahmadi, 2004).
- External opportunities and threats are social, cultural, economic, geographical, environmental, local, political, legal, technological and competitive events and trends which influence the organization future. Opportunities and threats are frequently beyond the enterprise control; hence they are external opportunities and threats (Ahangaran, 2003).
- Strengths and weaknesses are internal as they are controllable by the organization. Strengths and weaknesses are created in the light of activities pertaining to management, marketing, accounting, production and operation, research and development and computer information systems. One of the main activities of the strategic management is to identify them in different departments and units of an enterprise and evaluate them. Organizations seek continually to implement strategies that reinforce internal strengths and reduce weaknesses (Banker *et al*., 2004).

In SWOT matrix analysis, internal and external factors are assessed so as to identify the firm opportunities, threats, strengths and weaknesses in the future and to formulate adequate strategies to encounter them better. This matrix comprises four types of strategy, namely:

SO strategy: By these strategies, the organization endeavours to utilize external opportunities by using internal strengths. All managers prefer a position in which they can utilize external events and trends through using internal strengths. To achieve such positions, organizations usually apply WO, ST or WT strategies so as to be able to use SO strategies.

WO strategy: It aims at modifying internal weaknesses through utilizing existing outdoor opportunities. Sometimes there are so many desirable opportunities but the organization cannot use them due to internal weaknesses. Ways to implement WO strategy are to purchase the technology through cooperating with a company that has capability or competence or to employ qualified persons and train them technologies.

ST strategy: Companies try by using their strengths to reduce or remove existing outdoor threats; albeit a strong company encounters inevitably with some threats in the external environment.

WT strategy, organizations that implement this strategy take a defensive position which aims at reducing internal weaknesses and avoiding external threats. The organization that has some internal weaknesses and are faced with many threats in the external environment will be in a precarious situation. In fact, such an organization either seeks to decrease its activities and merge with other companies for survival or will declare bankruptcy and will ultimately be dissolved.

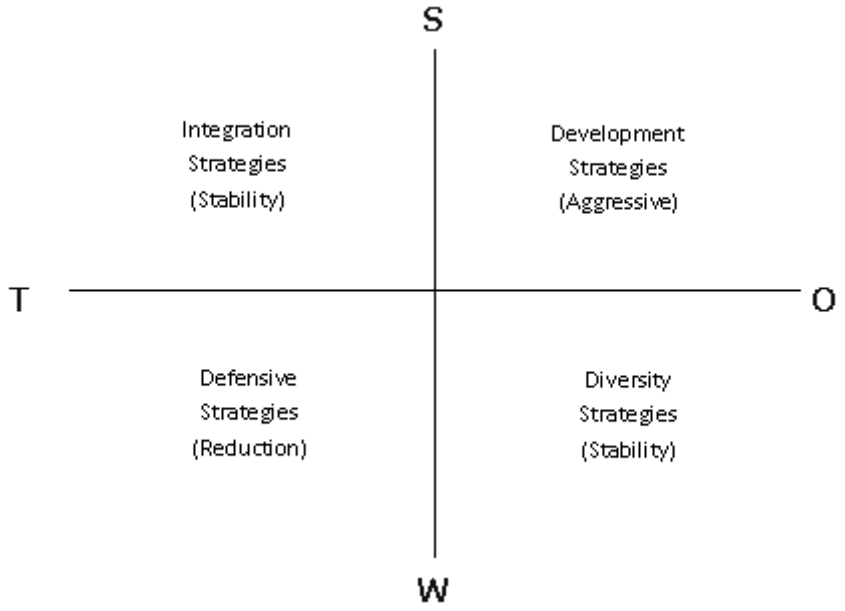

Fig. 1: Model of strategy zone determination via SWOT matrix

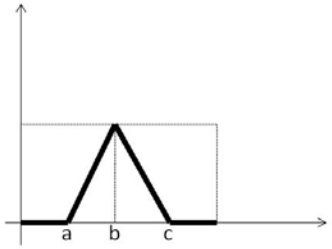

Fig. 2: Triangle membership function

To determine organization strategy, strategy differentiation diagram presented in Fig. 1 is applied.

One of the critics regarding SWOT method is that an identical weight has been allocated to the strengths, weaknesses, opportunities and threats which will negatively influence the analysis process. In this study, to avoid such a problem, fuzzy AHP method has been employed for ranking factors.

AHP method is one of the multi criteria decision making methods offered by Dr. Thomas Saaty which aims at creating a hierarchy of a problem complication in the form of degrees classification from big to small or from generic to specific and economic in order to attain more accurate understanding about the problem (Ghodsipour, 2006). In the literature of fuzzy set theory, several standard membership functions are defined and have many applications in practice. Triangle membership function applied in this study will be defined in the following. It is defined through three parameters of {a, b, c} illustrated in Fig. 2 (Azar and Faraji, 2008).

Mathematical relation of triangle fuzzy functions is as below:

$$Trn\left(x : a, b, c\right) = \begin{cases} 0 & x < a \\ (x-a)/(b-a) & a \le x \le b \\ (c-x)/(c-b) & b \le x \le c \\ 0 & x > c \end{cases}$$

Research background: Here, different models applied to formulate strategy particularly integrated models, are pointed out:

Kaplan and Norton (2007) in 1992, by establishing a BSC framework, selecting several measures and defining some goals for perfect management, studied an IT company as a sample for illustrating BSC usage (Kaplan, 1992). Paladino (2006) in a study, pointing to the causes of strategy failure in organizations, studied strategy measurement through balanced score card and then elaborated performance evaluation with regard to the balanced score card and linking reward to the performance evaluation results . Hafner (1998) considered performance evaluation as a learning process for the organization and by introducing and utilizing balanced score card method, presented performance management process in California University. Chih-Hsien and Shuo-Yan (2006) in a study designed a proper practice for an air freight terminal in Tiawan CKS airport through using balanced score card method and Quality Function Development (QFD) method. Considering the organization mission and outlook and having prepared the strategy plan, they introduced function assessment indicators (Chih-Hsien and Shuo-Yan, 2006). Shun-Hsing *et al*. (2006) investigated the relation among company strategies, environmental forces and BSC function measures.

Table 1: Fuzzy numbers corresponding to the preferences in paired comparisons by FAHP

Preference type	Triangle fuzzy number
Complete and absolute preference or importance	(7.2, 3, 5.2)
Much stronger preference or importance	(2, 5.2, 3)
Stronger preference or importance	(3.2, 2, 5.2)
Low priority or importance	(1, 3.2, 2)
Almost equal preference or importance	(1.2, 1, 3.2)
Exactly equal preference or importance	(1, 1, 1)

Analytical hierarchy is applied to calculate relative weights of function measures. They also suggested integration of BSC and AHP to assess the correlation between managers' classification of BSC perspectives and the company strategic innovations. Hopf *et al*. (2008) used AHP to complement BSC. The first level of a BSC hierarchy contains four BSC perspectives. The second level of hierarchy contains measures applied in each perspective. Analytical hierarchy may be applied to select BSC measures and to contribute to understanding the relative importance of the scales as well (Hopf *et al*., 2008). Bozbura *et al*. (2006) offered a FAHP (fuzzy analytical hierarchy process) methodology to modify the prioritization quality of human capital measures under fuzzy conditions. Ravi *et al*. (2005) analyzed the alternative methods in reverse logistics for old computers via an Analytical Network Process (ANP) and BSC approach. Analytical Network Process (ANP) structures reverse logistics alternative as the hierarchy and reverse logistics aspects were derived from perspectives (Ravi *et al*., 2005). Wu *et al*. aim at developing a balanced score card model by applying one of the multi criteria decision making methods to assess the performance of major research centers in Taiwan. They used VIKOR model to prioritize alternatives in the four zones of BSC model. In zones prioritization, they concluded that growth and learning zone has the most important role and the highest coefficient in performance assessment of research centers and the financial zone is the next one (Wu *et al*., 2011). García-Valderrama *et al*. (2009) designed a model for assessing the performance and the relation of BSC method four aspects by applying data envelopment analysis method (DEA) in the research and development companies. Hung-Yi *et al*. (2010) designed a model for assessing the performance of banking system by using FMCDM (fuzzy multi criteria decision making) methods in BSC. They employed FAHP method to rank 23 selected indicators of BSC four dimensions and ranked three banks selected as the research sample based on the designed model via three models of VIKOR, TOPSIS and SAW and concluded that the designed model has a good efficiency in assessing the banks performance. Lee *et al*. (2008) designed a model for assessing IT function in Taiwan manufacturing companies through integrating BSC and FAHP. With respect to the different models of strategic management offered by pervious scholars, Table 1 presents the models. The model applied in this study is an integrated model of SWOT and fuzzy AHP.

RESEARCH METHODOLOGY

This study is an applied research in terms of objective and it is considered as an analytic-descriptive research in terms of data collection and processing method. Also as it studies a specified organization namely Parsian Bank, it is considered as a case study. On the other hand, since a major part of data required for this research are obtained by referring to the organization managers and experts including those involved in programming and policy making affairs, it can be regarded as the survey type of descriptive method.

Statistical universe and sample: Statistical universe comprises all experts, staff managers, branch managers and the personnel of Parsian Bank headquarter located in Tehran. Sampling method in this study is targeted, specimen are specified and selected for interviews and receiving questionnaire. Due to using questionnaire in this research, below formula has been applied to estimate number of samples (Azar and Momeni, 2002).

$$n = \frac{N.Z_{\alpha/2}.\delta^2}{\varepsilon^2(N-1) + Z_{\alpha/2}.\delta^2}$$

Number of managers and personnel in the statistical universe equals 400 in Parsian Bank headquarter and by using the above formula, number of samples was estimated to be 36:

$$N = 400\ (1.96)\ (0.05) / (0.05)^2\ (399) + (1.96)\ (0.05) = 35.78$$

Data collection: Both library and field studies (interview and questionnaire) have been applied to collect data and derive information.

Questionnaire justifiability and reliability: Questionnaire justifiability has been fulfilled through providing academic and banking experts with the derived indices and considering their opinions in adding and removing some indices.

Reliability has been determined through Cronbach's Alpha method:

$$\alpha = \left(\frac{j}{j-1}\right)\left(1 - \frac{\sum s_j^2}{s^2}\right)$$

where, α denotes test reliability, j represents the number of test questions, s_j^2 is j^{th} subset variance and s^2 is the test total variance.

The number obtained via Cronbach's Alpha (0.786) reflects the questionnaire reliability (Momeni, 2007).

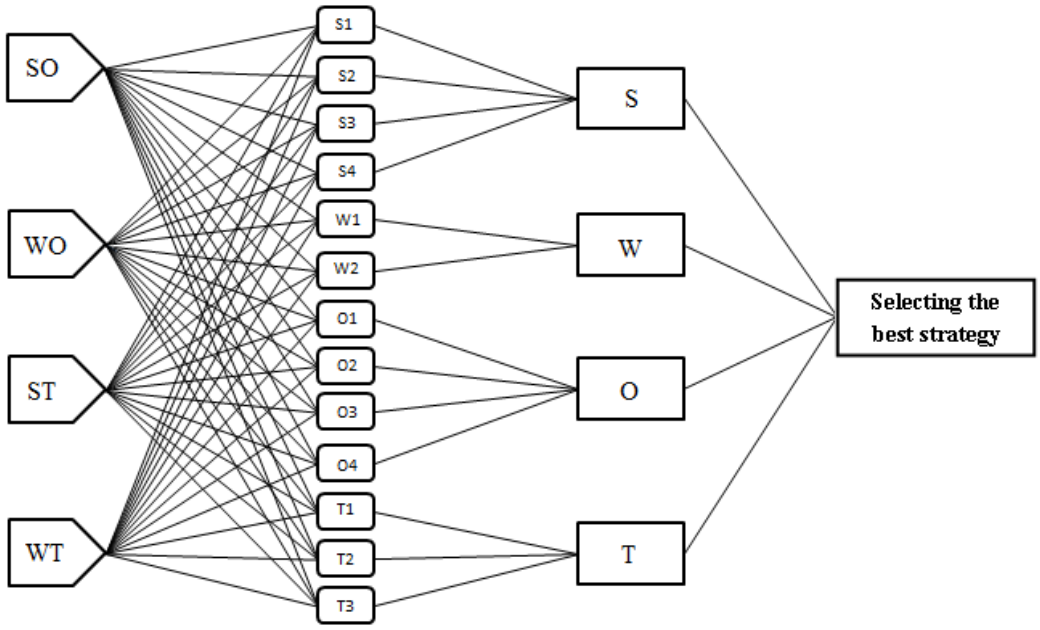

Fig. 3: Research conceptual model

Research conceptual model: To determine the proper marketing strategy, four dimensions of strengths (electronic banking, banking services, branches positioning, total cash volume), weaknesses (high rates of returns on bank facilities, too much bureaucracy), opportunities (construction of new branches, economic investments, staff academic trainings, development of IT network) and threats (establishment of foreign banks, increase in stated-owned banks capital, instruction to decrease the rate of returns on bank facilities) have been employed.

This model has been comprised of four levels. First level relates to selecting the best strategy and the second one relates to SWOT analysis main factors. SWOT sub-indices are located in the third level. It consists of four sub-indices for the major factor strength, two sub-indices for weakness, four sub-indices for opportunities and three sub-indices for threats. The last level indicates the strategies (SO development, ST integration, WO diversity, WT defensive). Figure 3 depicts the model.

RESEARCH FINDINGS

In this study, the first level is selecting the best strategy and the second level is criteria (four factors of S, W, O and T). Third level is the alternatives (bank overall marketing strategies: aggressive, defensive, conservative and competitive). At first, the second level binary comparison is made through FAHP method. Then sub-criteria binary comparison is calculated separately and ultimately strategic zone of Parsian Bank is determined. Parsian Bank strategies are listed in the strategic zone and the best strategy is determined. To present calculations method, following steps are generally introduced.

- Determining fuzzy numbers corresponding to the preferences in paired comparisons between variables shown in Table 1.
- Determining the triangle fuzzy number as below.

o Coefficient of each paired comparison matrix which is itself a triangle number, is calculated (s_k):

$$S_K = \sum_{i=1}^{n} M_{kj} * \left[\sum_{i=1}^{m} \sum_{i=1}^{n} M_{ij} \right]^{-1}$$

o Having calculated S_Ks, their largeness degree relative to each other must be estimated. In general, if M1 and M2 are two triangle fuzzy numbers, M1 largeness degree relative to M2 shown as V(M1≥M2), is defined as below:

If M1≥M2, $V(M_1 \geq M_2) = 1$

Otherwise,

$$V(M_1 \geq M_2) = hgt(M_1 * M_2)$$

Also we have:

$$hgt(m_1 \cap m_2) = \frac{u_1 - l_2}{(u_1 - l_2) + (m_2 - m_1)}$$

o Determining largeness degree (indices weight) of a triangle fuzzy number from k triangle fuzzy numbers through below relation.

Table 2: Determining importance degree of Boston matrix factors

Factors	Strengths	Weaknesses	Opportunities	Threats
Strengths	1	1.5	3	2
Weaknesses	-	1	5	5
Opportunities	-	-	1	1/3
Threats	-	-	-	1

Table 3: Fuzzy paired comparisons matrix of main factors

Factors	Strengths	Weaknesses	Opportunities	Threats
Strengths	(1, 1, 1)	(2.5, 1.2, 2.3)	(1, 3.2, 2)	(1.2, 1, 3.2)
Weaknesses	(3.2, 2, 5.2)	(1, 1, 1)	(3.2, 2, 5.2)	(3.2, 2, 5.2)
Opportunities	(1.2, 2.3, 1)	(2.5, 1.2, 2.3)	(1, 1, 1)	(1.2, 2.3, 1)
Threats	(2.3, 1, 2)	(2.5, 1.2, 2.3)	(1, 3.2, 2)	(1, 1, 1)

Table 4: Final matrix of main factors fuzzy paired comparisons by FAHP method

Factors	Strengths	Weaknesses	Opportunities	Threats
Strengths	(1.2, 1, 3.2)	(2.5, 1.2, 2.3)	(1, 3.2, 2)	(1, 1, 1)
Weaknesses	(1/2,2/3,1)	(2/5,1/2,2/3)	(1,1,1)	(1/2,2/3,1)
Opportunities	(3/2,2,5/2)	(1,1,1)	(3/2,2,5/2)	(3/2,2,5/2)
Threats	(1,1,1)	(2/5,1/2,2/3)	(1,3/2,2)	(2/3,1,2)

$$v(m_1 \geq m_2,...,m_k) = mi\left[v(m_1 \geq m_2),...,v(m_1 \geq m_k\right]$$

- Calculating indices weight in the paired comparison matrix, as below.

$$w'(x_i) = \min\left\{v(s_i \geq s_k\right\}, k = 1,2,...,n, k \neq i$$

- Determining index weight vector as below.

$$w' = \left[w'(c_1), w'(c_2) \text{ و...و } w'(cn)\right]^t$$

- Determining normalized weights of criteria via below formula.

$$W_j = \frac{W_i'}{\sum W_i'}$$

The weights calculated are the relative importance coefficient of each index (criterion) based on fuzzy AHP (via EA method) which specifies the best decision making option among decision making criteria. In the following, binary comparison of the second level criteria is merely calculated and results of other criteria are only stated to prevent repeated calculations.

Determining final matrix of main factors fuzzy paired comparison by FAHP method: Firstly, we fill in the tables determining importance degree of SWOT matrix factors through using collected questionnaire. For example, the first questionnaire replies are depicted in Table 2.

Then the above matrix elements and numbers are converted into fuzzy numbers based on the equalization in Table 4 "fuzzy numbers corresponding to preferences". For example, factors paired comparison matrix from first respondent viewpoint is shown in Table 3.

For final prioritization of the options, paired comparisons of all respondents must be integrated. One of the best methods is the geometric averaging. In the other words, tables similar to Table 3 are calculated for each respondent. Geometric averaging for elements a, b, c,…, n is estimated as below.

Geometric average = $(a * b* ... * n)^{1/n}$

Table 4 is the final table which presents integration caused by geometric averaging for all respondents as below.

Calculation of main factors relative and final weights: Having prepared fuzzy paired comparisons matrix, relative and final weights must be calculated. This study has applied developmental analysis method (Momeni, 2007). To shorten calculations, only the triangle fuzzy number of strengths is estimated and the results pertaining to estimating triangle fuzzy number of the other SWOT matrix elements are presented separately.

- **Determining coefficients of each paired comparisons matrix:**

S1 = (2.90, 4.50, 5.17)*(0.043, 0.054, 0.072) = (0.125,0 .243,0 .372)
S2 = (2.4, 2.83, 3.67)*(0.043, 0.054, 0.072) = (0.103,0 .153,0 .264)
S3 = (5.5, 7, 8.5)*(0.043, 0.054, 0.072) = (0.215, 0.378, 0.612)
S4 = (3.07, 4, 5.67)*(0.043, 0.054, 0.072) = (0.132,0 .216,0 .408)

- **Calculating largeness degree:**

V (S1≥S2) = 1
V (S1≥S3) = (0.372 - 0.215) / (0.372 - 0.215) + (0.378 - 0.243) = 157/292 = 0.537
V (S1≥S4) = 1
V (S2≥S1) = (0.264 - 0.125) / (0.264 - 0.125) + (0.243 - 0.153) = 139/229 = 0.607
V (S2≥S3) = (0.264 - 0.215) / (0.264 - 0.215) + (0.378 - 0.153) = 49/274 = 0.179
V (S2≥S4) = (0.264 - 0.132) / (0.264 - 0.132) + (0.216 - 0.153) = 132/195 = 0.677
V (S3≥S1) = 1
V (S3≥S 2) = 1
V (S3≥S4) = 1
V (S4≥S1) = (0.408 - 0.125) / (0.408 - 0.125) + (0.243 - 0.216) = 283 / 310 = 0.913
V (S4≥S2) = 1
V (S4≥S3) = (0.408 - 0.215) / (0.408 - 0.215) + (0.378 - 0.216) = 193 / 355 = 0.544

Table 5: Prioritization of Main factors by FAHP Method

Index (criterion)	Weight	Priority
Strengths	0.237	2
Weaknesses	0.079	4
Opportunities	0.440	1
Threats	0.241	3

Table 6: Comparison of strengths with the related options via FAHP method

Index (criterion)	Weight	Priority
IT Scope of application	0.338	1
Bank services	0.294	2
Branch locating	0.274	3
Cash volume	0.092	4

Table 7: Comparison of Weaknesses with related options by FAHP method

Index (criterion)	Weight	Priority
High interest rate of loan	0.332	2
Too much bureaucracy	0.382	1

- **Determining largeness amount (indices weights):**

  Min V (S1≥S2, S3, S4) = Min (1, 0.537, 1) = 0.537
  Min V (S2≥S1, S3, S4) = Min (0.607, 0.179, 0.677) = 0.179
  Min V (S3≥S1, S2, S4) = Min (1, 1, 1) = 1
  Min V (S4≥S1, S2, S3) = Min (0.913, 1, 0.544) = 0.544
  Vector of indices non-normalized weights are as below:

  W' = (0.537, 0.179, 1, 0.544)

- **Determining weight vector:**

  $w_i = \frac{w_i'}{\sum w'} \Longrightarrow \sum w' = 2.26 \rightarrow$ W = (0.237, 0.079, 0.44, 0.24)

- **Determining criteria normalized weights:** So, final weights and prioritization of four main factors effective on marketing strategy success in Parsian Bank from the whole sample view and through integration of FAHP and SWOT are illustrated in Table 5, respectively.

Figure 4 presents the software output which shows Table 5 results.

Relative and final weights of sub-indices (identified strength, weakness, opportunity and threat): The results obtained from binary comparison of each criterion with sub-indices are presented. Binary comparisons of criteria have been carried out by Expert Choice software. Table 6 shows comparison of strengths with the related options via FAHP Method and also Fig. 5 shows Software Output for Binary Comparison of Strengths with Related Options.

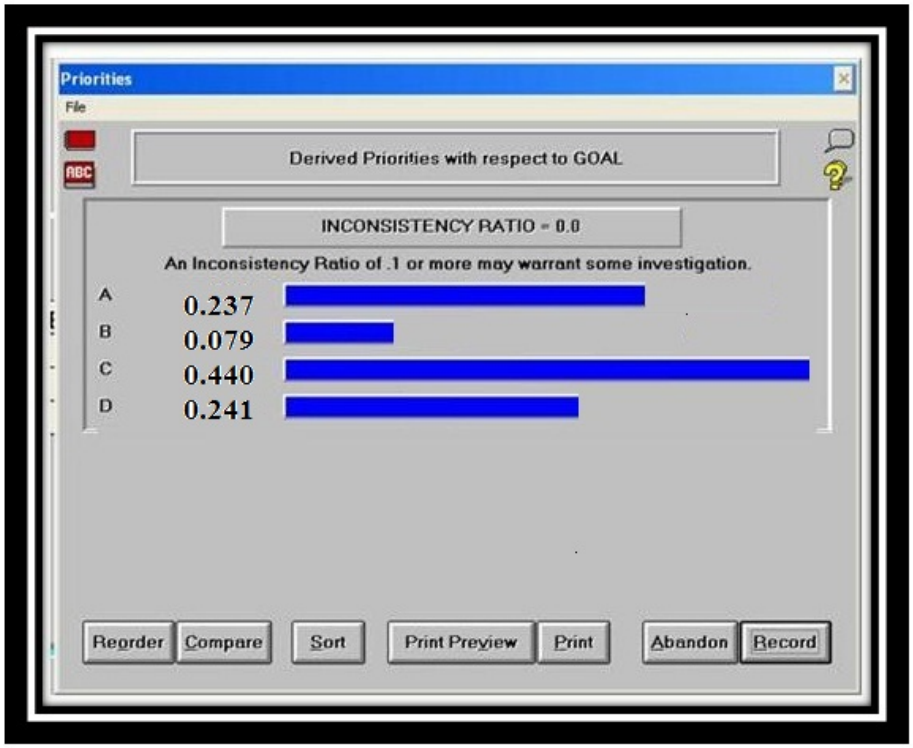

Fig. 4: Software output for binary comparison of first level criteria

Table 8: Comparison of opportunities with related options by FAHP method

Index (criterion)	Weight	Priority
Construction of new branches	0.2669	2
Investment in other economic sectors	0.2663	3
Increasing staff academic training	0.32	1
Development of electronic banking	0.147	4

Table 9: Comparison of threats with related options by FAHP method

Index (criterion)	Weight	Priority
Entry and commencement of foreign banks activities	0.170	3
Increase in capital of state-owned banks	0.211	1
Instruction to decrease interest rate	0.192	2

Table 6 to 9 demonstrated Comparison of Strengths with the Related Options via FAHP Method, Comparison of Weaknesses with Related Options by FAHP Method, Comparison of Opportunities with Related Options by FAHP Method, Comparison of Threats with Related Options by FAHP Method, respectively.

Figure 5 to 8 presented Software Output for Binary Comparison of Strengths with Related Options, Software Output for Binary Comparison of Weaknesses with Related Options, Software Output for Binary Comparison of Opportunities with Related Options, Software Output for Binary Comparison of Threats with Related Options, respectively.

Rates of inconsistency index calculated for all criteria are between 0 and 0.01, which indicates the significance of the whole model and approves the accuracy of the calculations process (as it is less than 0.1).

Marketing strategic zone: Calculations accuracy requires two tables assessing internal and external factors so as to determine the strategic zone. In the table pertaining to internal factors, strengths and weaknesses are assessed and the table of external factors evaluated opportunities and threats. If the total final score of the organization in this matrix is more than 2.5; then, as expected, opportunities will overcome threats and if this score is less than 2.5, then threats will overcome the opportunities. In the following, Table 10 presents integration of internal and external factors.

Table 10 depicts that external factors take precedence over internal factors. Hence, main challenges of Parsian Bank are formulating marketing strategy, environmental opportunities and threats.

Position Matrix and Strategic Measure (SPACE): Space matrix possesses four sections including aggressive, conservative, offensive

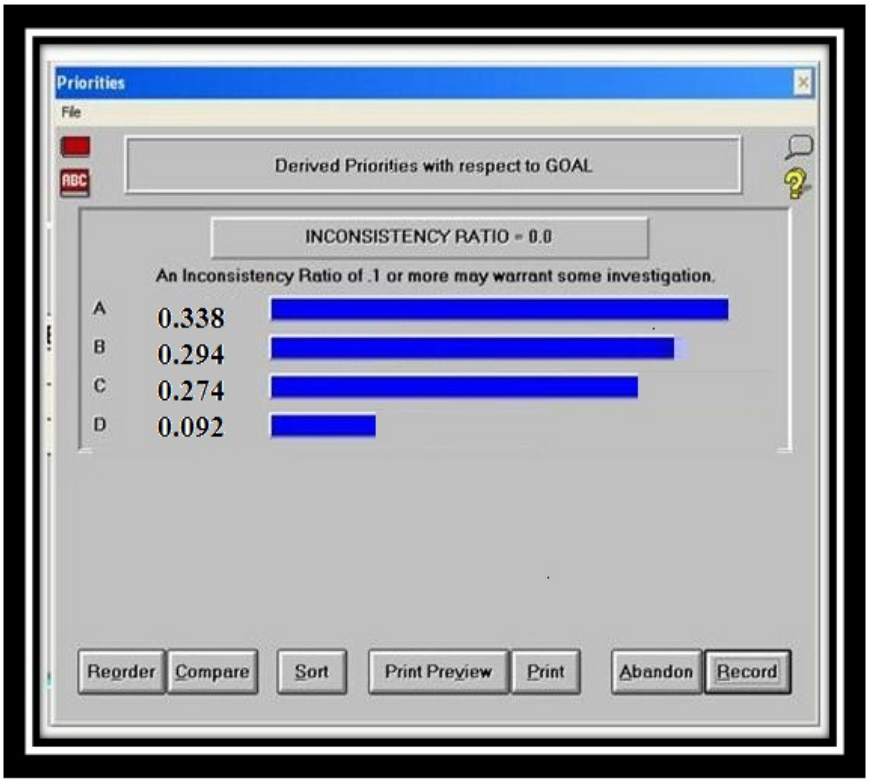

Fig. 5: Software output for binary comparison of strengths with related options

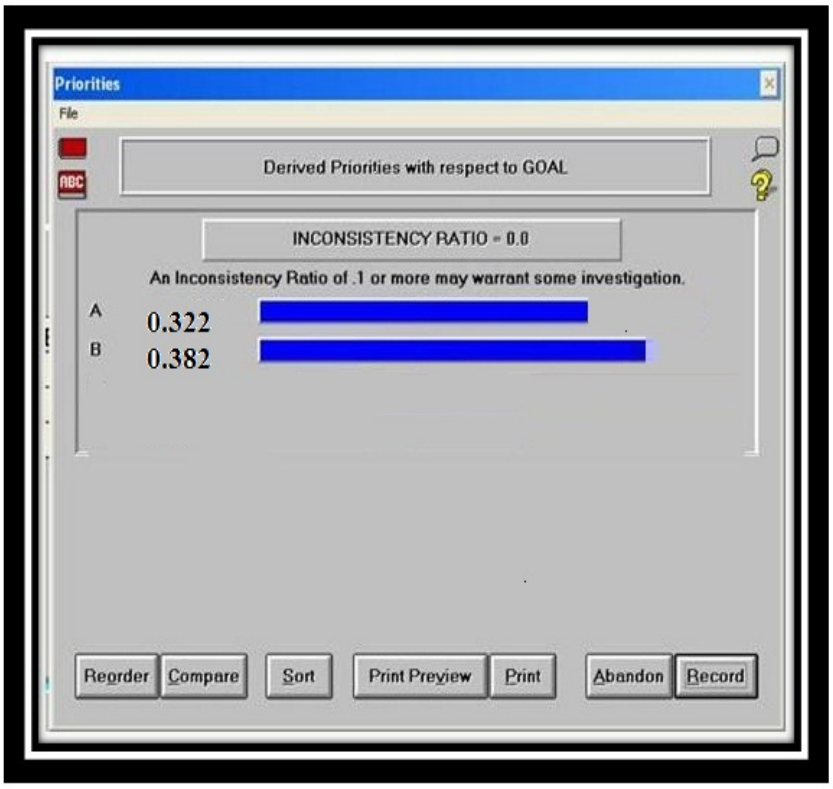

Fig. 6: Software output for binary comparison of weaknesses with related options

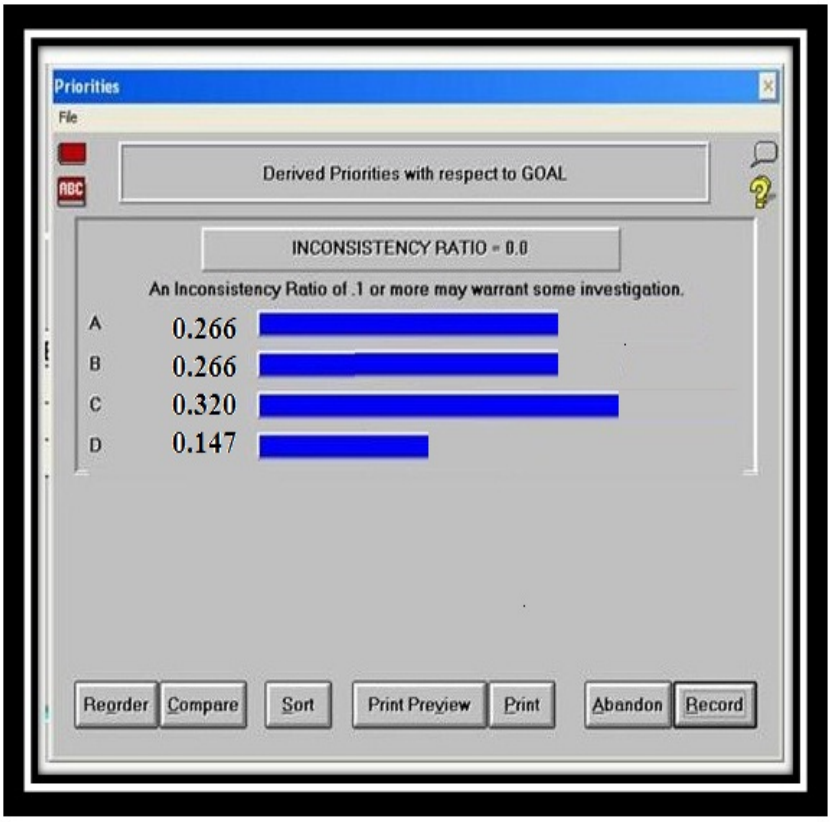

Fig. 7: Software output for binary comparison of opportunities with related options

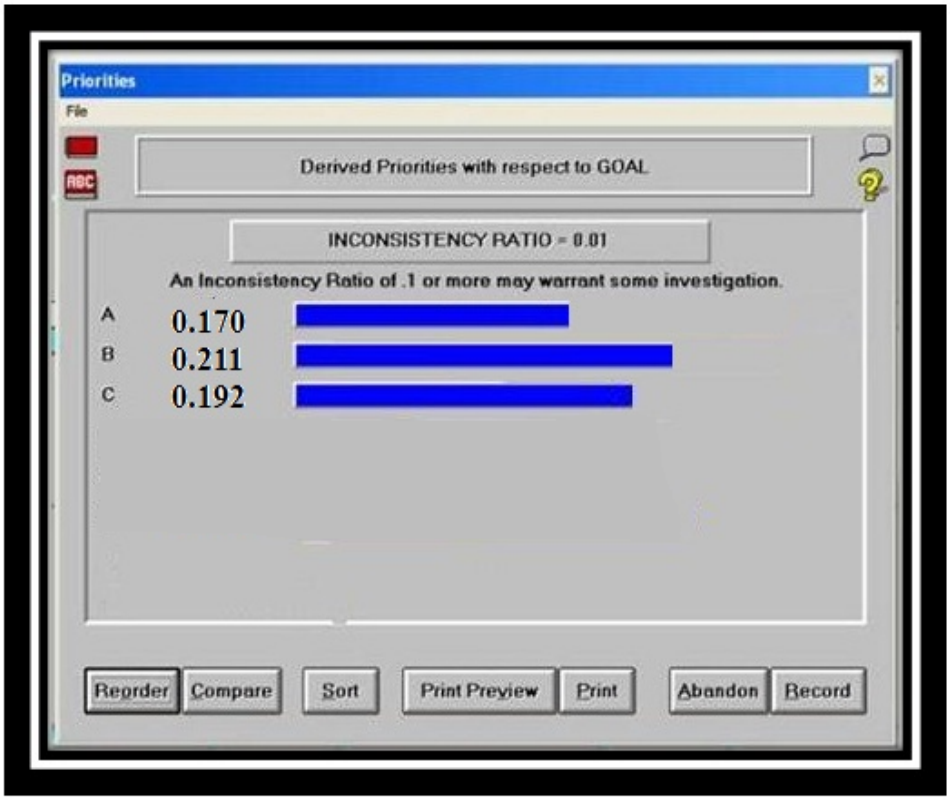

Fig. 8: Software output for binary comparison of threats with related options

Table 10: Calculation of Internal and External Factors

Priority factors			Relative importance coefficient	Rank	Importance coefficient * rank
Internal factors	Strengths	IT scope of application	0.18	4	0.72
		Banking services	0.11	3	0.33
		Branches positioning	0.9	3	0.27
		Cash volume	0.26	4	0.104
	weaknesses	High interest rate of loans	0.25	3	0.75
		Too much bureaucracy	0.11	2	0.22
	Sum	$\sum = 1$	2.394		
External factors	Opportunities	Construction of new branches	0.15	4	0.60
		Investment in other economic sectors	0.12	3	0.36
		Increase in staff academic trainings	0.11	2	0.22
		Development of electronic banking	0.14	3	0.42
	Threats	Entry of foreign banks and commencement of their activities	0.24	4	0.96
		Increase in capital of state-owned banks	0.17	3	0.51
		Instruction to decrease interest rates	0.7	2	0.14
	Sum	$\sum = 1$	3.21		

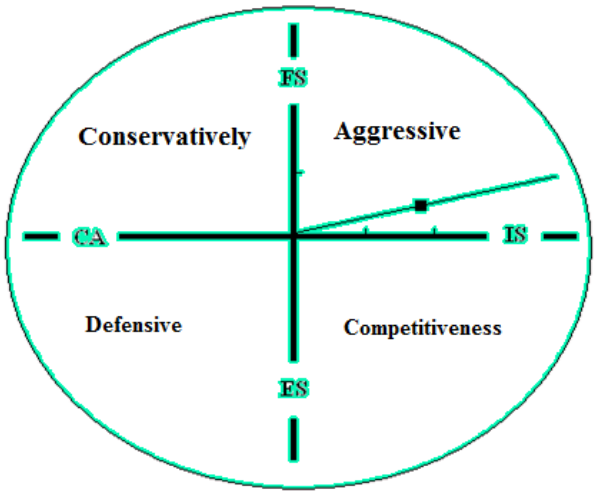

Fig. 9: Space matrix of determining strategic zone

Table 11: Financial Strength (FS)

Row no	Title	Score
1	Return on investment	3
2	Cash strength	5
3	Cash flows	4
4	Financial lever	5
5	Working capital	4
Mean		4.2

Table 12: Environment Stability (ES)

Row no	Title	Score
1	Inflation rate	-3
2	Demand changes	-4
3	Demand changes	-3
4	Competitors products prices	-3
5	Competition pressure	-6
Mean		-3.8

Table 13: Competitive Advantage (CA)

Row	Title	Score
1	Market share	5
2	Product quality	6
3	Customers loyalty	4
4	Technical knowledge	4
5	Product life cycle	4
Mean		4.6

Table 14: Income Strength (IS)

Row no	Title	Score
1	Financial stability	-3
2	Profitability power	-2
3	Capital accumulation	-4
4	Ease of entering into the market	-3
5	Efficiency	-2
Mean		-28

and competitive strategies. Matrix axis represent two internal dimensions of FS and CA and two external dimensions of IS and ES. These four factors play the most important role in determining an organization strategic position. To summarize, calculations results are demonstrated in Table 11 to 14. Figure 9 presents Space Matrix of Determining Strategic Zone.

$$CA \longleftrightarrow IS = 4.6 - 2.8 = 1.8$$

$$FS \longleftrightarrow ES = 4.2 - 3.8 = 0.4$$

So, Fig. 9 depicts the strategic zone.

This position indicates that Parsian Bank is financially strong and must select an aggressive strategy. To determine the final strategy of Parsian Bank, strategies prioritization tables using attractiveness score for 4 strategic zones (development SO, integration ST, diversity WO and defensive WT) have been applied with regard to internal and external factors. Among strategies of vertical and horizontal development, vertical strategy (aggressive) is determined as the main strategy for Parsian Bank, with respect to the attractiveness scores specified by experts.

CONCLUSION

Sophistication of managerial decisions, conflict caused by nature of communicative interactions in a group decision, issues relating to a hierarchy structure and experienced and old managers who have difficulties with adjusting themselves with others, decrease the quality of decisions on selecting the proper strategy. To determine the best strategy via AHP, organizations give the young managers the opportunity to be released from problems pertaining to the traditional group decision making so as to be able to take steps towards increasing decisions quality by using practical suggestions. In order to utilize integrated approaches and to provide an approach with higher reliability, the present study integrates the common decision making methods (SWOT, FUZZY and AHP), in which one method weaknesses are offset by the other one strengths, to offer a solution for formulating Parsian Bank marketing strategies. This approach is applicable in all financial and non-financial decisions and compensates the weaknesses of common ranking methods.

Since the optimal strategic zone for Parsian Bank is recognized to be the aggressive zone, following marketing strategies are suggested:

- The first bank in Iran regarding local market share
- Attaining the largest share of the country international transactions among private banks
- Top of the range of modern banking services, private banking
- Committed to create maximum satisfaction for all beneficiaries
- Precursor in offering electronic banking services

REFERENCES

Ahangaran, M.E., 2003. Strategic Planning Principles and Basics. Zohd Publication, Tehran.

Ahmadi, A., 2004. Strategic Planning of Information and Communication Technology. 2nd Edn., Tolide Danesh Publication, Tehran.

Azar, A. and H. Faraji, 2008. Fuzzy Management Science. Ketab-e-Mehraban Publication, Tehran.

Azar, A. and M. Momeni, 2002. Statistical Issues Elaboration. Baztab Publication, Tehran.

Banker, R.D., H. Chang, S.N. Janakiraman and C. Konstans, 2004. A balanced Scorecard analysis performance metrics. Eur. J. Oper. Res., 154: 423-436.

Bozbura, F.T., A. Beskes and C. Kahraman, 2006. Prioritization of human capital measurement indicators using fuzzy AHP. Expert syst. Appl., 27: 123-129.

Chih-Hsien, C. and C. Shuo-Yan, 2006. A B.Sc. framework for air cargo terminal design: Procedure and case study. J. Ind. Technol., 22(1).

García-Valderrama, T., E. Mulero-Mendigorri and D. Revuelta-Bordoy, 2009. Relating the perspectives of the balanced scorecard for R&D by means of DEA. Eur. J. Oper. Res., 196: 1177-1189.

Ghodsipour, S.H., 2006. Issues on Multi-criteria Decision Making, Analytical Hierarchy Process. Amir Kabir Industrial University Publication, Tehran, Iran.

Hafner, K.A., 1998. Partnership for Performance, the Balanced Scorecard Put to the Test at the University of California. University of California Office of the President, California.

Hech, M., 2006. Organization Theory: Modern, Symbolic and Post-modern Interpretation (Translated by Hasan Danaeefard). Afkar Publication, Tehran.

Hopf, R.H., D.J. Litman, L.W. Pratsch, I.M. Ustad, R.A. Welch, T.J. Tychan and P.A. Denett, 2008. Guide to a Balanced Scorecard, Performance Management Methodology. Department of Energy, USA.

Hung-Yi, W., T. Gwo-Hshiung and C. Yi-Hsuan, 2010. A fuzzy MCDM approach for evaluating banking performance based on Balanced Scorecard. Expert Syst. Appl., 36: 10135-10147.

Kangas, J., M. Kurtila, M. Kajanus and A. Kangas, 2003. Evaluating the management strategies of a forestland estate-the S-O-S approach. J. Environ. Manag., 69: 349-358.

Kaplan, R.S., 1992. The Balanced Scorecard Measures that Drive Performance. Retrieved from: http://www.filestube.com/5588cc4c47f64e4503e9.

Kaplan, R.S. and D.P. Norton, 2007. Strategy-based Organization (Translated by Parviz Bakhtiari). Industrial Management Organization Publication, Tehran.

Kotler, P., 1988. Marketing Management: Analysis, Planning, Implementation and Control. 6th Edn., Englewood Cliffs, Prentice-Hall, NJ.

Kurttila, M., M. Pesonen, J. Kangas and M. Kajanus, 2000. Utilizing the Analytic Hierarchy Process (AHP) in SWOT analysis: A hybrid method and its application to a forest-certification case. Forest Policy Econ., 1: 41-52.

Lee, A.H.I., W.C. Chen and C.J. Chang, 2008. A fuzzy AHP and BSC approach for evaluating performance of IT department in the manufacturing industry in Taiwan. Expert Syst. Appl., 34(1): 96-107.

Momeni, M., 2007. Statistics and its Application in Management. Academic Human Sciences Books Publication (Samt).

Paladino, R.E., 2006. Strategic Balanced Scorecard-Based Budgeting and Performance Management. Crown Castle International (CCI).

Ravi, V., R. Shankar and M.K. Tiwari, 2005. Analyzing alternatives in reverse logistics for end of life computers and balanced approach. Comput. Ind. Eng., 48: 327-356.

Shahi, M., 2004. A modern model for formulating it strategy. 2nd International Conference on Information Technology and Knowledge.

Shun-Hsing, C., Y. Ching-Cho and S. Juin-Yan, 2006. Scorecard in the performance evaluation. TQM Mag., 18(2): 190-205.

Stisy, R., 2005. Strategic Thinking and Development Management (Translated by Mustafa Jafari and Mehryar Kazemi Movahed, Rasa Publication). Gostaresh Publication, Tehran.

Torkashvand, A., 2002. IT Strategic Planning in Padideh Company. Institute of Higher Education in Public Management, pp: 33.

Wu, H.Y., Y.K. Lin and C.H. Chang, 2011. Performance evaluation of extension education centers in universities based on the balanced scorecard. Eval. Progr. Plann., 34: 37-50.