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Performance Evaluation and Ranking the Branches of Bank using FAHP and TOPSIS

Case study: Tose Asr Shomal Interest-free Loan Fund

AliasgharAliakbarzadeh[1], Akbar Alem Tabriz [2]
Department of Management, Buin Zahra Branch, Islamic Azad University, Buin Zahra, Iran
Professor of Management Department, ShahidBeheshti University, Tehran, Iran

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Abstract

There is no denial of the fact that performance evaluation is a critical managerial attempt in any organization especially financial institutions such as banks. MCDM methods have been utilized as efficient and common tools in many fields such as finance and economy and attract significant attention from public and financial regulators. The numerous opinions and enormous criteria associated with bank performance evaluation confines the implication of any single objective model. Therefore, multi-criteria decision making approach has been applied for this purpose. Fuzzy AHP and TOPSIS (Technique for Order Preference by Similarity to an Ideal Solution method) are implemented to accomplish more ideal level of performance evaluation and to reveal the ranking of branches and identify the ones taking leading positions in the market. This paper aims at rating the branches of Tose Asr Shomal Interest-free Loan Funds based on financial and non-financial performance criteria extracted from related literature and experts' viewpoints. The weights of criteria were gained by AHP using experts' opinions. Moreover, at non-financial level, a LIKERT questionnaire was used to gather customers' viewpoints. After getting the financial data of the year 2013-2014, the branches were rated using TOSIS. The results revealed that the financial criteria had higher importance than non-financial ones and by synthesizing financial and non-financial performance; Keshavarz branch attained the first rank among the 13 branches.

Keywords: Performance evaluation, Rating, Multi-criteria decision making, AHP, TOPSIS.

Introduction

The ability of financial institutions to attract financial resources and provide various credit operations and different financial services activate financial flows that influence the growth and economic development of a nation (Stankevičienė & Mencaitė 2012). The method of managing the financial system of a country must enable the financial institutions to recognize the

management problems on time since the level of problems resulting from poor bank management threaten the whole financial system of the country. Hence, bank performance evaluation has been considered great importance not only by supervising institutions, regulators and bank management but also by clients, as they are concerned about the stability and sustainability of these financial institutions. There is no doubt that using the most accurate and modern evaluation techniques would ensure a healthy financial system.

Traditionally bank performance evaluation is based on the analysis of financial ratios. However, nonfinancial performance criteria have been recognized significant that should be taken in to account to fully satisfy the analysis of needs and bank operations' efficiency evaluation (Secme et al 2009, Toloie-Eshlaghy et al 2011, Amile et al 2013, Islam et al 2013). For this reason, the financial ratio analysis is complemented with different non-financial criteria. Therefore, a model is presented in this paper to both evaluate financial and non-financial performance of the 13 branches of Tose Asr Shomal Interest-free Loan Funds in Babol.

Multi Criteria Decision Making (MCDM) methodologies are well–suited to the complexity of economic decision problems and significantly improve the robustness of financial analysis and business decisions in general (Balzentis et al. 2012). For this reason, Fuzzy AHP and TOPSIS are used to analyze the gathered data based on the purpose of the study. First FAHP will be used to determine the weight of main criteria and sub criteria, and then TOPSIS will be applied for ranking the 13 branches.

The remainder of this paper is organized as follows. Section 2 of this paper includes an overview of the literature on the evaluation of bank performance and section 3 describes fuzzy AHP and TOPSIS methodologies. Section 4 displays our empirical results along with some discussions relating to managerial implications. Finally, conclusions and remarks are then given in Section 5. Performance evaluation framework of the research is illustrated in figure 1.

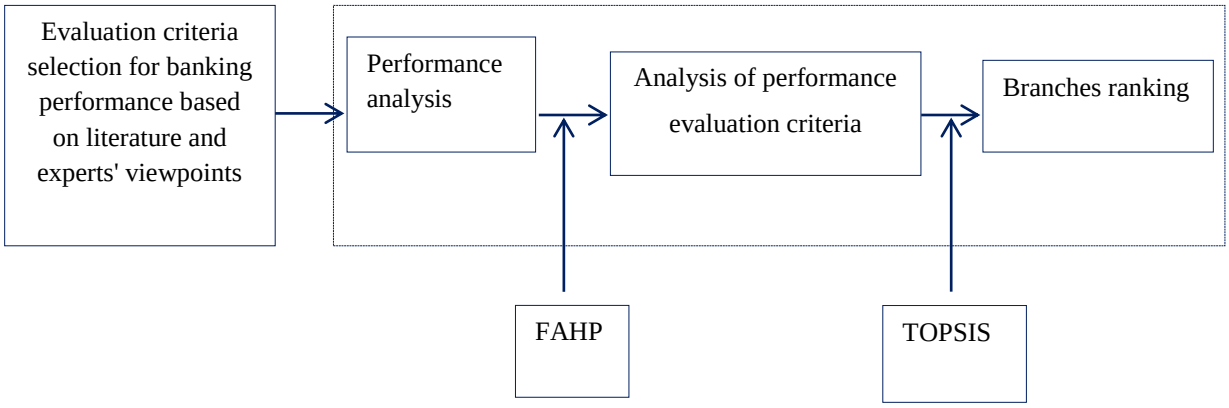

Figure 1: Performance evaluation framework of the research

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2. Literature Review of Bank Performance Evaluation and the Applied Methodologies

A number of different approaches have been developed to deal explicitly with bank branch performance evaluation (Ferreira et al. 2011). Evaluations of the performance of a bank can be diverse (Kosmidou et al. 2006). Several previous studies on bank performance used different criteria and various methodologies which are summarized in table1.

Table 1. An overview of previous researches on the performance evaluation of banks

Authors	Method of bank performance evaluation
Karr (2005), Badreldin (2009)	Using ROA and ROE measures for bank performance
Ho & Wu (2009), Minh et al. (2013) Abbott et al. (2013) Grigoroudis et al. (2013) Marie et al. (2013)	DEA approach- a mathematical programming technique
Ayadi *et al.* (1998) Hays *et al.* (2009) Sayed and Sayed (2013)	CAMEL(C -Capital Adequacy, A - Assets Quality, M - Management Efficiency, E - Earning Quality, L - Liquidity and S - Sensitivity to Market Risk)
Manandhar & Tang (2002) Chen & Chen (2008),Wu et al. (2009) Shaverdi et al. (2011)	Balance Scorecard (BSC)
Kalhoefer & Salem (2008) Badreldin (2009) Collier & McGowan (2010)	The Du Pont System for Financial Analysis was applied. The evaluation of performance was separated into three elements: 1) net profit margin, 2) total asset turnover and 3) the equity multiplier.
Ferreira et al. (2011)	Cognitive Mapping
Lassar et al.(2000),Newman (2001) Gerrard & Cunningham (2005) Awan et al. (2011) Shlash Mohammad & Mohammad Alhamadani (2011) Toloie-Eshlaghy et al (2011) Amirzadeh & Shoorvarzi (2013)	SERVQUAL
Stankevičienė & Mencaitė (2012) Önder & Hepşen (2013) Dincer & Hacioglu (2013)	Analytic Hierarchical Analysis (AHP)
Albayrak & Erensal (2005) Wu et al (2009) Chatterjee et al. (2010) Shaverdi et al. (2011) Amile et al. (2013)	Fuzzy Analytic Hierarchical Analysis (FAHP)
Secme et al. (2009), Wu et al. (2009) Pal & Choudhury (2009) Önder & Hepşen (2013) Amile et al. (2013)	TOPSIS
Amirzadeh & Shoorvarzi (2013) Toloie-Eshlaghy et al. (2011)	FTOPSIS

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Despite the widespread application of mentioned methodologies, applying FAHP and TOPSIS have been recognized as one of the most efficient methods in performance evaluations and traditional coefficients (or ratios), for example, have been criticized for being operationally limited when dealing with multiple criteria and provide lagged information (Lau and Sholihin, 2005; Wu *et al*., 2006). For this reason, FAHP and TOPSIS are used in the present paper to overcome some methodological limitations.

3. Methodology

The experts were the head masters or high rank managers with at least 15 year service and Master degree in the 13 branches. This study compares the financial and non-financial performances of 13 branches of Tose Asr Shomal. For this aim, fuzzy AHP and TOPSIS methods were integrated. While fuzzy AHP was used for determining the weights of main and sub-criteria, the TOPSIS method was applied for ranking the branches.

For ranking these branches, at financial level, the experts were asked to score a point to each criteria using Likert spectrum and at non-financial level, the data was gathered using a Likert based questionnaire distributed and collected from customers. The mean of the scores and the weights gained form fuzzy AHP were used as the inputs for TOPSIS method for ranking the branches. Moreover, the required financial data was obtained from each branch's documents.

I. Extent Analysis Method on Fuzzy AHP

Bellman and Zadeh (1970) were the first to propose the decision making problem in fuzzy environments and they announced the initiation of FMCDM. This analysis method has been widely applied to deal with DM problems involving multiple criteria evaluation/selection of alternatives in various fields.
In this study, Chang's extent analysis method on fuzzy AHP (Chang 1996), therefore triangular fuzzy numbers (TFN) are used. Triangular fuzzy numbers are represented as l/m, m/u, (or (l, m, u) in which l, m and u refer to, respectively, the lower value, modal value and upper value.
Let *X*= { *x* 1, *x* 2, *x* 3,..., *xn*} = , *G*={ *g* 1, *g* 2, *g* 3,..., *gn* } be an object set and a goal set respectively. Then each object is taken and extent analysis for each goal is performed respectively. Therefore, m extent analysis values for each object can be obtained, with the following signs:
$M_{gi}^{1}, M_{gi}^{2}, \dots, M_{gi}^{m}, \quad i = 1,2,\dots,n$
Where $M_{gi}^{j} \ (j = 1,2,\dots,m)$all are TFNs. The steps of Chang's extent analysis can be given as following:
Step 1: The value of fuzzy synthetic extent with respect to the ith object is defined

$$S_i = \sum_{j=1}^{m} M_{gi}^{j} \otimes \left[\sum_{i=1}^{n} \sum_{j=1}^{m} M_{gi}^{j}\right]^{-1} \qquad (1)$$

To obtain $\sum_{j=1}^{m} M_{gi}^{j}]$, the fuzzy addition operation of m extent analysis values for a particular matrix is performed such as:

$$\sum_{j=1}^{m} M_{gi}^{j} = (\sum_{j=1}^{m} l_j , \sum_{j=1}^{m} m_j, \sum_{j=1}^{m} u_j) \qquad (2)$$

and to obtain $[\sum_{j=1}^{n}\sum_{j=1}^{m} M_{gi}^{j}]^{-1}$,the fuzzy addition operation of M_{gi}^{j} (j=1,2,…,m) values is performed such as :

$$\sum_{i=1}^{n}\sum_{j=1}^{m} M_{gi}^{j} = \left(\sum_{i=1}^{n} l_i , \sum_{i=1}^{n} m_i, \sum_{i=1}^{n} u_i \right) \qquad (3)$$

And then inverse of the vector above is computed, such as:

$$[\sum_{i=1}^{n}\sum_{j=1}^{m} M_{gi}^{j}]^{-1} = \left(\frac{1}{\sum_{i=1}^{n} u_i} , \frac{1}{\sum_{i=1}^{n} m_i}, \frac{1}{\sum_{i=1}^{n} l_i} \right) \quad (4)$$

Step 2: As $M_1 = (l_1,m_1,u_1)$and $M_2 =(l_2,m_2,u_2)$ are two triangular fuzzy numbers , the degree of possibility of

$M_2 = (l_2,m_2,u_2) \geq M_1 =(l_1,m_1,u_1)$ is defined as

$V(M_2 \geq M_1) = sup\ [\min(\mu_{M_1}(x) , \mu_{M_2}(y)]$ $y \geq x$ (5)

and can be expressed as follows:

$V(M_2 \geq M_1)$ =hgt $(M1 \cap M2) = \mu_{M_2}(d)$ =

$$\begin{cases} 1 & \text{,if } m_2 \geq m_1 \\ 0 & \text{if } l_1 \geq u_2 \\ \frac{l1-u2}{(m2-u2)+(m1-l1)} & \text{if otherwise} \end{cases}$$

Where d is the ordinate of the highest intersection point D between μ_{M_1} andμ_{M_2}. To compare *M* 1and *M* 2, we need both the values of *V* (*M*1≥ *M*2) and *V* (*M*2≥ *M*1).

Step3: The degree possibility for a convex fuzzy number to be greater than k convex fuzzy *M i* (*i*= 1,2,...*k*) numbers can be defined by (i=1,2,…,k)

$$V(M \geq M_1 ,\ldots, M_K) = V[(M \geq M_1) \text{ and } V(M \geq M_2) \text{and} \ldots \text{ and } (M \geq M_k)]$$

$$= \min V(M \geq M_I) \qquad (7)$$

Assume that *d* (*A i*) =min *V* (*S İ* ≥ *S K*) for *k* = 1,2,...,*n* ;

k ≠ *i* . Then the weight vector is given by

$$W' = (d'(A_1), d'(A_2), \ldots d'(A_n))^T \qquad (8)$$

where $A\ i$ = (i = 1,2,...,) are n elements.

Step 4: Via normalization, the normalized weight vectors are
W =(d(A 1),d(A 2),...,D($A\ n$))^{T} where W is a non-fuzzy number. (9)

Linguistic Variables at Fuzzy Set: According to Zadeh (1975), the notion of a linguistic variable is vital where a conventional quantification of reasonable expression in complex or hard situations is difficult to define. A variable whose values are words or sentences in a natural or artificial language is defined as linguistic variable. Here, five basic linguistic terms are used, for comparing the best plan evaluation criteria as "absolutely important," "very strongly important," "essentially important," "weakly important," and "equally important" according to a fuzzy five-level scale (Chiou & Tzeng 2002). The membership function of a linguistic term is defined by Mon et al. (1994) and displayed in Table 2.

Table 2: Membership functions of linguistic scales.

Linguistic scale	Triangular fuzzy scale	Triangular fuzzy reciprocal scale
Equally important	(1, 1, 1)	(1, 1, 1)
Weakly important	(1, 3, 5)	(1/5, 1/3, 1)
Strongly important	(3, 5, 7)	(1/7, 1/5, 1/3)
Very strongly important	(5, 7, 9)	(1/9, 1/7, 1/5)
Absolutely important	(7, 9, 9)	(1/9, 1/9, 1/7)

II. TOPSIS Method

Technique for Order Preference by Similarity to Ideal Solution (TOPSIS) was first presented by Yoon and Hwang (1980) and Hwang and Yoon (1981), for solving multiple criteria decision making (MCDM) problems based upon the concept that the chosen alternative should have the shortest Euclidian distance from the positive ideal solution (PIS) and the farthest from the negative ideal solution (NIS).
In this study, TOPSIS method is used for determining the final ranking of the alternatives.
Step1: Decision matrix is normalized via Eq.(10):

$$r_{ij} = \frac{w_{ij}}{\sqrt{\sum_{j=1}^{J} w_{ij}^2}}, \qquad j = 1,2,3,\ldots,J \quad i = 1,\ldots,n \quad (10)$$

Step2: Weighted normalized decision matrix is formed:
$v\ ij = w\ i * r\ ij$ j = 1,2,3,...J , i = 1,...,n (11)
Step3: Positive ideal solution (PIS) and negative ideal solution (NIS) are determined:

$A^* = \{v_1^*, v_2^*, \ldots, v_n^*\}$ *maximum values* (12)

$A^- = \{v_1^-, v_2^-, \ldots, v_n^-\}$ minimum values (13)

Step4: The distance of each alternative from PIS and NIS are calculated

$$d_i^* = \sqrt[2]{\sum_{j=1}^{n}(v_{ij} - v_j^*)^2} \quad i=1,2,\ldots,J \quad (14)$$

$$d_i^- = \sqrt[2]{\sum_{j=1}^{n}(v_{ij} - v_j^-)^2} \quad i=1,2,\ldots,J \quad (15)$$

Step5: The closeness coefficient of each alternative is calculated

$CL_i = \frac{d_i^-}{d_i^* - d_i^-}$ (16)

Step6: By comparing *CC i* values, the ranking of alternatives are determined.

4. Findings Analysis

4.1. Performance Evaluation's Indicators

The hierarchical structure in Fig. 2 shows the research conceptual model. The overall goal at the first level determines the best total performance. At the second level, the hierarchic structure is separated into financial and non-financial performances. By this way, three hierarchic structures are used to determine the weight of each main and sub criteria.

The performance analysis is based on the selective assessment standard. First, FAHP approach has been employed to calculate the relative weight of the performance assessment criteria. Then, TOPSIS has been applied to rank the branches.

Based on the hierarchical framework of the study for the performance assessment criteria, the fuzzy AHP questionnaires were distributed which used Triangular Fuzzy Numbers (TNF) among the experts of the Tose Asr Shomal Institute branches to achieve their expert opinion.

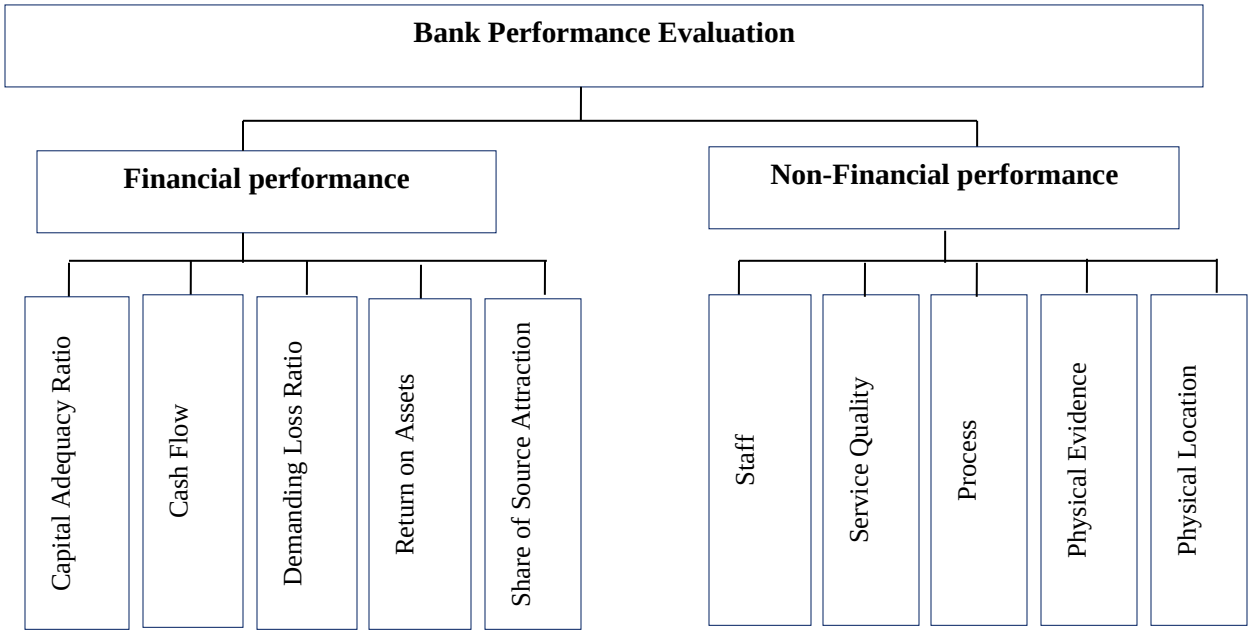

Figure 2: Hierarchical structure of model for total performance evaluation

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4.2. Financial Performance Evaluation

Financial ratios have been grouped as cash flow, return on assets, capital adequacy ratio, and demanding loss ratio. Moreover, share of attracting sources has two sub-criteria which are source growth and non-committed deposit to all deposit ratios. The hierarchical structure in Fig. 2 shows the financial aspect of the performance evaluation. The final weights of financial criteria and sub-criteria gained by Fuzzy AHP are shown in table 3 and 4.

Table 3: The final weights of financial criteria

	$w_i = \frac{w'i}{\sum w'i}$
Capital adequacy ratio	0.243
Demanding loss ratio	0.057
Cash flow	0.095
Share of attracting sources	0.324
Return on assets	0.282

Table 4: The final weights of Share of attracting sources sub- criteria

	$w_i = \frac{w'i}{\sum w'i}$
Source growth	0.44
Non-committed deposit to all deposit ratio	0.56

Based on table 3 at financial performance level, the share of attracting sources (0.324), return on assets (0.282) and capital adequacy ratio (0.243) obtained the first, second and third priority, respectively. Non-committed deposit to all deposit ratio (0.56) gained higher importance than source growth (0.44) as the sub-criteria level of the share of attracting sources as shown in table 4.

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4.3. Non-Financial Performance Evaluation

The sub-criteria of non-financial performance are presented in table 5.

Table 5: Sub-criteria of non-financial performance

Main Criteria	***Staff***						***Service quality***				***Physical Evidence***					***Process***				***Physical Location***	
Sub-criteria	Availability to customers	Accountability to customers	Service expressing ability	Being confidant	Politeness and good behavior	Work efficiency	Sensibility	Reliability	Trust	Empathy	Equipment	Lighting	Furniture	Building interior design	Interior layout	Offering various bank liabilities	Opening various bank accounts	The speed of performing tasks	Rework avoidance	Location of branches	Number of branches

After implementing the process of Fuzzy AHP, the final weights of criteria and sub criteria of non-financial performance are acquired which are presented in table 6.

Table 6: The final weights of criteria and sub-criteria of non-financial performance

Table 6 lists the relative importance (fuzzy weights) of each of the nonfinancial performance

Main Criteria	***Staff*** *(0.046)*						***Service quality (0.529)***				***Physical Evidence (0.017)***					***Process*** (0.018)				***Physical Location(0.39)***	
Sub-criteria	Availability to customers (0.079)	Accountability to customers (0.189)	Service expressing ability (0.031)	trustworthy (0.22)	Politeness and good behavior (0.289)	Work efficiency (0.192)	Sensibility (0.112)	Reliability (0.27)	Trust (0.232)	Empathy (0.386)	Equipment (0.284)	Lighting (0.114)	Furniture (0.222)	Building interior design (0.27)	Interior layout (0.11)	Offering various bank liabilities (0.193)	Opening various bank accounts (0.4)	The speed of performing tasks (0.193)	Rework avoidance (0.007)	Location of branches (0.628)	Number of branches (0.372)

criteria by FAHP. The results reveal that the most important of the five criteria is the service quality (0.529), and then is the physical location (0.390), after that is the staff (0.046), and the last ones are the process and physical evidence (0.018) and (0.017), respectively.

Table 7: The code of 13 branches of Tose Asr Shomal Financial Institute

Branch Name	Branch Code
Markazi	1
Keshavarz	2
Meidan Bar	3
Shahid Bazaz	4
Imam Reza	5
Bagh Ferdous	6
Haft Tir	7
Shahid Geraeili	8
Tohid	9
Shahid Keshvari	10
Imam Khomeini	11
Shahid Fahmideh	12
Ghadir	13

4.4. Ranking the 13 branches applying TOPSIS

Now a TOPSIS analysis is conducted for computing the rank of the branches on the basis of the previous evaluated weights of criteria and sub-criteria. The positive and negative ideal points are estimated. CL_i of each branch is computed. The branch with greater CL_i enjoys better performance. Table 8 illustrates the financial index amounts (decision making matrix) which are extracted from the financial statement of the 13 branches.

Table 8: Financial index amounts for the year 2013-2014

Type of index	-	-	+	+	+	+
Branch code	Capital adequacy	Demanding loss ratio	Cash flow	Non-committed deposit to all deposit ratio	Source growth	Return on assets
1	32.27	0.533	6.36	0.227	69.32	0.43
2	17.89	0.314	4.42	0.265	59.04	3.08
3	54.64	0.319	15.64	0.054	78.37	2.05
4	49.24	0.25	14.89	0.218	51.31	2.18
5	61.36	0.263	12.78	0.149	54.87	1.25
6	34.87	0.361	9.8	0.142	84.19	1.16
7	45.77	0.604	9.4	0.005	49.33	0.91
8	80	0.699	13.91	0.082	63.21	1.22
9	67.36	1.16	15.31	0.035	39.77	1.67
10	61.46	0.409	9.82	0.032	54.65	0.87
11	43.81	1.616	7.63	0.056	77.07	0.37
12	63.58	0.328	13.83	0.024	48.43	1.12
13	22.31	0.981	17.7	0.141	42.1	2.01

Table 9: Positive ideal solution (PIS) and negative ideal solution (NIS)

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+A	0.0265	0.0012	0.0771	0.0864	0.0483	0.1177
-A	0.1184	0.0081	0.0277	0.0016	0.0228	0.0141

Table 10 and 11 show the evaluation results and final ranking of banks. Depends on the Cl_i values (Table 11), the ranking of the alternatives regarding financial performance from top to bottom order are Keshavarz, Ghadir, Shahid Bazaz, Bagh Ferdous, Meidan Bar, Markazi, Imam Reza, Tohid, Imam Khomeini, Haft Tir, Shahid Geraeili, Shahid Fahmideh and Shahid Keshvari.

Table 10: The distance of each alternative from PIS and NIS

di+		*di-*	
d1+=	0.1157	d1-=	0.1027
d2+=	0.0203	d2-=	0.1666
d3+=	0.0966	d3-=	0.0892
d4+=	0.0638	d4-=	0.1147
d5+=	0.1059	d5-=	0.0707
d6+=	0.0939	d6-=	0.0910
d7+=	0.1322	d7-=	0.0568
d8+=	0.1323	d8-=	0.0545
d9+=	0.1211	d9-=	0.0666
d10+=	0.1361	d10-=	0.0391
d11+=	0.1372	d11-=	0.0603
d12+=	0.1306	d12-=	0.0508
d13+=	0.0628	d13-=	0.1251

Table 11: Financial performance ranking for the year 2013-2014

cli	Branch Name	Rank
0.8914	Keshavarz	1
0.6657	Ghadir	2
0.6424	Shahid Bazaz	3
0.4923	Bagh Ferdous	4
0.4800	Meidan Bar	5
0.4704	Markazi	6
0.4003	Imam Reza	7
0.3549	Tohid	8
0.3052	Imam Khomeini	9
0.3004	Haft Tir	10
0.2918	Shahid Geraeili	11
0. 2798	Shahid Fahmideh	12
0.2233	Shahid Keshvari	13

The amounts of non-financial criteria and sub-criteria were obtained by the questionnaire distributed among customers and the mean of scores were acquired based on Likert spectrum. Table 12, 13, 14, 15 and 16 show the cl_i and the ranks of branches regarding non-financial performance criteria.

Table 12: Non-financial performance ranking regarding *staff* index for the year 2013-2014

cli	Branch Name	Rank
0.9794	Meidan Bar	1
0.8932	Markazi	2
0.8932	Imam Khomeini	3
0.8854	Shahid Bazaz	4
0.8651	Bagh Ferdous	5
0.8411	Keshavarz	6
0.7646	Haft Tir	7
0.7348	Imam Reza	8
0.7070	Shahid Fahmideh	9
0.6208	Tohid	10
0.6059	Shahid Geraeili	11
0. 5963	Shahid Keshvari	12
0.0154	Ghadir	13

Table 13: Non-financial performance ranking regarding *service quality* index for the year 2013-2014

cli	Branch Name	Rank
0.7112	Imam Reza	1
0.7031	Bagh Ferdous	2
0.6920	Keshavarz	3
0.6247	Ghadir	4
0.5605	Shahid Bazaz	5
0.5378	Tohid	6
0.4913	Meidan Bar	7
0.4903	Shahid Geraeili	8
0.4599	Haft Tir	9
0.4412	Shahid Fahmideh	10
0.4140	Markazi	11
0. 4140	Imam Khomeini	12
0.3660	Shahid Keshvari	13

Table 14: Non-financial performance ranking regarding *process* index for the year 2013-2014

Cli	Branch Name	Rank
0.8681	Ghadir	1
0.7401	Meidan Bar	2
0.5379	Haft Tir	3
0.5309	Bagh Ferdous	4
0.5211	Shahid Bazaz	5
0.5032	Imam Reza	6
0.5010	Keshavarz	7
0.4805	Tohid	8
0.3833	Shahid Keshvari	9
0.2794	Shahid Fahmideh	10
0.1459	Markazi	11
0. 1459	Imam Khomeini	12
0.0635	Shahid Geraeili	13

Table 15: Non-financial performance ranking regarding *physical evidence* index for the year 2013-2014

cli	Branch Name	Rank
0.9325	Ghadir	1
0.9109	Meidan Bar	2
0.6510	Bagh Ferdous	3
0.6326	Keshavarz	4
0.5710	Tohid	5
0.5050	Shahid Fahmideh	6
0.4585	Haft Tir	7
0.4462	Imam Reza	8
0.3723	Shahid Bazaz	9
0.2957	Shahid Keshvari	10
0.2519	Shahid Geraeili	11
0. 2212	Markazi	12
0.2212	Imam Khomeini	13

Table 16: Non-financial performance ranking regarding *physical location* index for the year 2013-2014

cli	Branch Name	Rank
0.9128	Meidan Bar	1
0.8178	Ghadir	2
0.5318	Bagh Ferdous	3
0.3858	Keshavarz	4
0.3083	Shahid Bazaz	5
0.2880	Shahid Fahmideh	6
0.2552	Tohid	7
0.2551	Imam Reza	8
0.1727	Haft Tir	9
0.1300	Markazi	10
0.1300	Imam Khomeini	11
0. 0923	Shahid Keshvari	12
0.0595	Shahid Geraeili	13

Regarding the acquired rank of each branch based on the nonfinancial performance, to get the overall rank of nonfinancial criteria, the obtained rank of each criterion was multiplied by obtained weight and then they were added. The results are presented in table 17.

Table 17: The nonfinancial performance values of branches

Gahadir	Sh. Fahmideh	Imam Khomeini	Sh. Keshvari	Tohid	Sh. Geraeili	Haft Tir	Bagh Ferdous	Imam Reza	Sh. Bazaz	Meidan Bar	Keshavarz	Markazi	Weight	
0.0154	0.7070	0.8932	0.5963	0.6208	0.6059	0.7646	0.8651	0.7348	0.8854	0.9794	0.8411	0.8932	0.046	Staff
0.6247	0.4412	0.4140	0.3660	0.5378	0.4903	0.4599	0.7031	0.7112	0.5605	0.4913	0.6920	0.4140	0.529	Service quality
0.8681	0.2794	0.1459	0.3833	0.4805	0.0635	0.5379	0.5309	0.5032	0.5211	0.7401	0.5010	0.1459	0.018	Process
0.8178	0.2880	0.1300	0.0923	0.2552	0.0595	0.1727	0.5318	0.2551	0.3083	0.9128	0.3858	0.1300	0.390	Physical location
0.9325	0.5050	0.2212	0.2957	0.5710	0.2519	0.4585	0.6510	0.4462	0.3723	0.9109	0.6326	0.2212	0.017	Physical evidence
0.6816	0.3919	0.3171	0.2690	0.4310	0.3159	0.3633	0.6398	0.5262	0.4732	0.6897	0.5750	0.3171	Weighted sum	

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As one of the main purposes of the paper was ranking the branches based on financial and nonfinancial performance, the obtained ranks of branches at both financial and nonfinancial performance were multiplied by related weight and then were added. The results are shown in table 18.

Table 18: The branches' total performance value and their total ranking

Gahadir	Sh. Fahmideh	Imam Khomeini	Sh. Keshvari	Tohid	Sh. Geraeili	Haft Tir	Bagh Ferdous	Imam Reza	Sh. Bazaz	Meidan Bar	Keshavarz	Markazi	Weight	
0.6657	0.2798	0.3052	0.2233	0.3549	0.2918	0.3004	0.4923	0.4003	0.6424	0.4800	0.8914	0.4704	0.590	Financial performance
0.6816	0.3919	0.3171	0.2690	0.4310	0.3159	0.3633	0.6398	0.5262	0.4732	0.6897	0.5750	0.3171	0.410	Non-financial performance
0.6722	0.3257	0.3101	0.2420	0.3861	0.3017	0.3262	0.5527	0.4519	0.5730	0.5660	0.7617	0.4075		Weighted sum
2	**10**	**11**	**13**	**8**	**12**	**9**	**5**	**6**	**3**	**4**	**1**	**7**	Rank	

The comparison of the obtained rank of each branch at financial, nonfinancial and total performance is illustrated in table 19.

Table 19: Comparison of each branch rank at financial, nonfinancial and total performance

Branch	Financial rank	Nonfinancial rank	Total rank
Markazi	6	10	7
Keshavarz	1	4	1
Meidan Bar	5	1	4
Shahid Bazaz	3	6	3
Imam Reza	7	5	6
Bagh Ferdous	4	3	5
Haft Tir	10	9	9
Shahid Geraeili	11	11	12
Tohid	8	7	8
Shahid Keshvari	13	12	13
Imam Khomeini	9	10	11
Shahid Fahmideh	12	8	10
Ghadir	2	2	2

The total ranking of the branches shows that Keshavarz, Ghadir and Shahid Bazaz were placed as the first three branches, respectively.

5. Conclusion

This study focused on the use of qualitative judgments of experts as well as quantitative parameters of Tose Asr Shomal Financial Institute in order to rank the 13 branches while trying to cover all the factors that could affect the performance of branches. Performance evaluation at both financial and nonfinancial level can help improve financial institutes' performance by

identifying strengths and weaknesses and determining how their strengths can be best utilized within the organization and weaknesses overcome as well can help to reveal problems which may restrict branches' progress and cause inefficient work practices and strategies.

In the present study, FAHP method was utilized to determine the weights of the main and sub-criteria of the performance evaluation hierarchy. The TOPSIS method was used to rank the branches in terms of their financial, non-financial and total performances. In the comparisons, financial performance is found to be more important than non-financial performance by the decision makers because of the competitive environment. Moreover, based on the total performance evaluation results, Keshavarz branch emerged as the first rank holder followed by Ghadir and Shahid Bazaz.

The framework offered in this study can be used greatly. This study could be further widened to consider other evaluation methods such as VIKOR and PROMETHEE which could have been applied for the ranking of the banks. In addition, the study can be expanded for comparative analysis between state-owned and private banks. The obtained results have important consequences for effective investment decision making processes for branches leading in the market and the ones standing behind.

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Corresponding Author

Akbar Alem Tabriz, Professor of Management Department, ShahidBeheshti University, Tehran, Iran. Email address: a-tabriz@sbu.ac.ir

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