Presenting a model of non-financial criteria affecting the financial performance of the banking industry using a structural equation modeling approach

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Abstract

The present study investigated and analyzed the non-financial criteria affecting financial performance in the banking industry. The present study is applied, survey, descriptive, and correlational type. The study's statistical population included experts and internal managers at different levels of supervision of banks listed on the Tehran Stock Exchange. The sample size was estimated at 384 people based on Cochran's formula. The Lee et al. standard financial performance evaluation questionnaire [19] was used. To measure the non-financial criteria, the researcher-made questionnaire was used. It included 54 indicators in 6 dimensions of "individual, organizational, structural, developmental, process, and environmental factors". The content validity ratio index of Lawshe [16] according to the opinion of 30 experts was greater than 0.33 for all 54 items. In the second stage, Waltz and Basel's content validity index was implemented and it was obtained higher than 0.79. The Cronbach's alpha coefficient of the questionnaires was higher than 0.70, indicating the internal consistency of the items and confirming their reliability. Data were analyzed using structural equation modelling in AMOS 26 software. Individual, organizational, and process factors did not significantly affect the financial performance of the bank. Structural factors with a standard coefficient of 0.28, developmental factors with a standard coefficient of 0.25, and environmental factors with a standard coefficient of 0.24 at the 99% confidence positively and significantly affected the financial performance of the bank. Using the proposed model of non-financial criteria effective in determining the financial performance of the bank can result in adopting an appropriate approach in the field of financial management of the bank to improve the analysis of the financial performance of the bank.

Keywords: non-financial criteria, financial performance, banking industry, structural equation modeling
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1 Introduction

The philosophy of a company's performance evaluation can be analyzed using agency theory. Based on the agency theory, there is a conflict of interest in the relationship between shareholders and company managers. This conflict is due to the separation of ownership and control, the difference in their goals, and the asymmetry of information

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between them since managers make decisions that are in line with their interests and are in conflict with those of shareholders [4, 14]. Nowadays, in many business units, the disclosure of non-financial performance evaluation criteria in financial reports is increasing. The disclosure of non-financial performance evaluation criteria provides more qualitative information than the traditional evaluation system.

Non-financial criteria have a financial aspect and the information obtained from them should be collected and extracted from sources other than the accounting system [24]. Financial criteria merely consider quantitative aspects of performance such as profitability and cost. However, they ignore the criteria such as quality and flexibility that affect the success of the organization. Non-financial criteria are more closely associated with the organization's long-term strategies. Financial evaluation systems are primarily short-term and do not reflect issues related to customers and competitors or non-financial goals that may be significant in achieving profitability, competitive power, and long-term strategic goals [25]. The proponents of using non-financial criteria for performance evaluation believe that using such criteria for performance evaluation has many benefits at the individual and organizational levels and will lead to the improvement of citizenship behaviour, loyalty, and job performance of employees in the organization.

The use of performance evaluation systems relying merely on financial indicators results in the emergence of shortcomings such as putting pressure on managers to pay attention to short-term outcomes, not moving toward the development of the organization, sectoral controlling rather than controlling the entire organization and developing ineffective strategies. The existing limitations of traditional performance evaluation systems make it necessary to develop new methods that pay attention to financial and non-financial criteria simultaneously [22]. Many researchers have realized that financial criteria consider merely quantitative aspects of performance such as profitability and cost and ignore criteria such as quality and flexibility that have an equal effect on the success of the organization [24]. For this purpose, the present study investigates the non-financial criteria affecting financial performance in the banking industry.

2 Research methodology

The present study was applied in terms of aim and survey and descriptive-correlational in terms of nature. The study's statistical population included internal experts and managers of different levels of supervision of banks listed in the Tehran Stock Exchange and employees and heads of branches who have university and academic education. The sample size was calculated at 384 people according to Cochran's formula and considering the confidence level of 95%, the measurement error of $\alpha = 5\%$, and the number of supervisory employees and foreign currency-Rial branches of 26 banks listed in the Tehran Stock Exchange:

$$n = \frac{\frac{Z^2}{4d^2}}{1 + \frac{1}{N}\left(\frac{Z^2}{4d^2} - 1\right)} = \frac{\frac{(1.96)^2}{4(0.05^2)}}{1 + \frac{1}{100000}\left(\frac{(1.96)^2}{4(0.05^2)} - 1\right)} = 384. \tag{2.1}$$

In the present study, to measure the bank's financial performance, the Lee et al. standard financial performance evaluation questionnaire [18] was used. To measure the non-financial criteria affecting the financial performance of the banks, a researcher-made questionnaire including 54 indicators in 6 dimensions "individual, organizational, structural, developmental, process, and environmental factors" was designed and developed by examining and analyzing the theoretical foundations and studies of reviewing the literature. It was scored on a 5-point Likert scale (very low=1, low=2, medium=3, high=4, and very high=5).

To calculate the content validity ratio index of Lawshe [16], the designed questionnaire was submitted to 30 experts (including deputies of different levels of banks listed in the Tehran Stock Exchange) in this field and they were asked to answer each of the questions. According to the three-point Likert scale, the questions were classified into three categories "2-necessary", "1-useful but unnecessary", and "0-unnecessary". Then, according to the following formula, the content validity ratio was calculated:

$$CVR = \frac{n_e - \frac{N}{2}}{\frac{N}{2}} \tag{2.2}$$

where ne indicates the number of experts who have identified the question as necessary and N is the total number of experts who have answered the question. Based on the Lawshe table, the acceptable content validity ratio was considered at 0.33 based on the number of experts. After calculating the content validity ratio, the score of all 54 items was greater than the value of the Lawshe table (0.33). Thus, the results showed that the presence of relevant items with an acceptable level of statistical significance ($P < 0.05$) in this tool is necessary. In the second stage, CVI was performed based on Waltz's and Basel's content validity index [27]. For this purpose, the three criteria of

"simplicity", "relevance" and "clarity" were separately analyzed on a 4-point Likert scale (1: irrelevant; 2: somewhat relevant; 3: relevant; 4: totally relevant) for each of the items by 15 experts. The content validity index for each item was calculated by dividing the number of experts who agree with the item rated 3 and 4 by the total number of the panel of experts [13]. Hyrkas et al [11] recommended a score of 0.79 and above to accept items based on the CVI score. If the item scores are between 0.70 and 0.79, they will need to be revised [11].

The results showed that all 54 items had a CVI score higher than 0.79. Thus, they were identified as suitable and accepted. To determine the reliability of the questionnaires, Cronbach's alpha coefficient was measured in SPSS 26 software. It was calculated at 0.89 for the non-financial criteria questionnaire, 0.83 for the financial performance questionnaire, and 0.85 for the total questionnaire (0.85). The values higher than 70 indicated the internal consistency of the items and confirmed the reliability. Data were analyzed based on structural equation modeling using AMOS 26 software.

The fuzzy Delphi method was used to screen and ensure the importance of the identified indices and to select the final indices. Experts' opinions were used to assess the importance of the indices. Different methods were proposed to collect n respondents' opinions. In fact, these collection methods are experimental methods that have been proposed by various researchers. For example, a common method for collecting a set of triangular fuzzy numbers is considered as minimum l, geometric mean m and maximum u:

$$F_{AGR} = (\min\{l\}, \prod\{m\}, \max\{u\}) \tag{2.3}$$

$$F_{AGR} = \left(\min\{l\}, \left\{\frac{\sum m}{n}\right\}, \max\{u\}\right) \tag{2.4}$$

$$F_{AVE} = \left(\left\{\frac{\sum l}{n}\right\}, \left\{\frac{\sum m}{n}\right\}, \left\{\frac{\sum u}{n}\right\}\right) \tag{2.5}$$

Each triangular fuzzy number obtained from the collection of experts' views on the jth index is represented as follows:

$$\begin{aligned} \tau_j &= (L_j, M_j, U_j) \\ L_j &= \min(X_{ij}) \\ M_j &= \sqrt[n]{\prod_{i=1}^{n} X_{ij}} \\ U_j &= \max(X_{ij}) \end{aligned} \tag{2.6}$$

where the i-index refers to an 'expert's opinion, so that:

- X_{ij} : The value of assessment of the ith expert of the jth index

- L_j : The minimum value of assessment for the jth index

- M_j : The geometric mean of the experts' assessment of the performance of the jth index

- U_j : The maximum value of assessments for the jth index

In this study, we used the fuzzy mean method. The aggregated mean of triangular and trapezoidal fuzzy numbers can usually be summarized by a single value which is the best-related mean. This operation is called defuzzification. There are several methods for defuzzification. In most cases, the following simple method is used for defuzzification:

$$x_m^1 = \frac{L + M + U}{3} \tag{2.7}$$

Another simple method for defuzzification of the mean of fuzzy triangular numbers is as follows:

$$\begin{aligned} F_{ave} &= (L, M, U) \\ x_m^1 &= \frac{L + M + U}{3}; \quad x_m^2 = \frac{L + 2M + U}{4}; \quad x_m^3 = \frac{L + 4M + U}{6} \\ \text{Crisp number} &= Z* = \max(x_{\max}^1, x_{\max}^2, x_{\max}^3) \end{aligned} \tag{2.8}$$

$x^i_{\max}$ Values do o not differ much and are always numerically close to the value of M. M is the mean of the sum of possible m values from different triangular fuzzy numbers. However, the definite value of the largest amount calculated $x^i_{\max}$ will be considered. In this study, the center of area method is used for defuzzification as follows:

$$DF_{ij} = \frac{[(u_{ij} - l_{ij}) + (m_{ij} - l_{ij})]}{3} + l_{ij} \qquad (2.9)$$

3 Results

Table 1 presents the demographic characteristics of the experts. It shows that 100% of the subjects were male. It also shows that 25% are in the age group of less than 45 years, 58.3% are in the age group of 45 to 55 years, and 16.7% are in the age group of over 55 years. Also, 83% of them have definite official employment status.

Table 1: Demographic characteristics of participating experts

Variable	Group	Frequency	Percentage of frequency
Gender	Male	12	100
	Female	0	0
Age	35-45 years	3	25
	45-55 years	7	58.3
	55-65 years	2	16.7
Employment status	official-experimental	2	17
	official-definitive	10	83

Figure 1 shows the effect of independent and dependent variables. The numbers mentioned on the effect between the variables are regression coefficients that indicate the positive effect of the independent variable on the dependent variable.
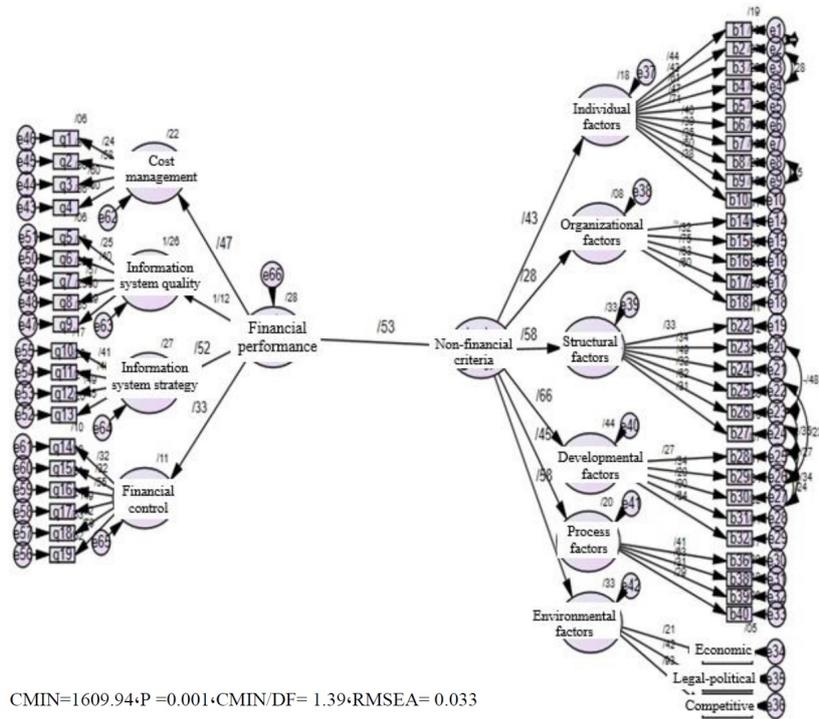

CMIN=1609.94،P =0.001،CMIN/DF= 1.39،RMSEA= 0.033

Figure 1: Structural model of the research

Based on the results obtained from Table 2 regarding the analysis of the fit of the model according to the fit indices, it can be stated that the factor analysis model has a suitable fit for testing the desired hypothesis. In other words, given the good fit indices, this model can be used to analyze the non-financial criteria affecting the financial performance in the banking industry.

Table 2: The goodness of fit indices of the structural model of the research variables

The goodness of fit indices of the model	CMIN	DF	CMIN/DF	NPAR	P	GFI	AGFI	IFI	TLI	CFI	NFI	RMSEA
Fitted model	1609.94	1156	1.39	0.119	0.001	0.85	0.84	0.93	0.92	0.93	0.78	0.033
Desirable values	df=	–	3 <	–	0.05 >	0.90 >	0.90 >	0.90 >	0.90 >	0.90 >	0.90 >	0.08 <

Table 3: Path coefficients of research variables

sig		Path coefficients		Paths
	t-value	Non-standardized parameter	Standardized parameter	
0.001	3.22	0.75	0.53	non-financial criteria ← financial performance

According to Table 3, the results obtained from testing the above model show that the direct effect of non-financial criteria on the financial performance of the bank ($P < 0.05, t = 3.22, \beta = 0.53$) is positive and significant.

The research's primary hypothesis: non-financial criteria affect the bank's financial performance. Based on the information in Table 3 and Figure 1, non-financial criteria positively and significantly affect the financial performance of the bank with a standard coefficient of 0.53 and a significance level of 0.001. Thus, based on the results, with a confidence of 99%, the null hypothesis was rejected and the opposite hypothesis was accepted. It means that on-financial criteria affect the bank's financial performance.

Figure 2 shows the effect of independent and dependent variables. The numbers mentioned on the effect between the variables are regression coefficients that indicate the direction of the effect of the independent and dependent variables.

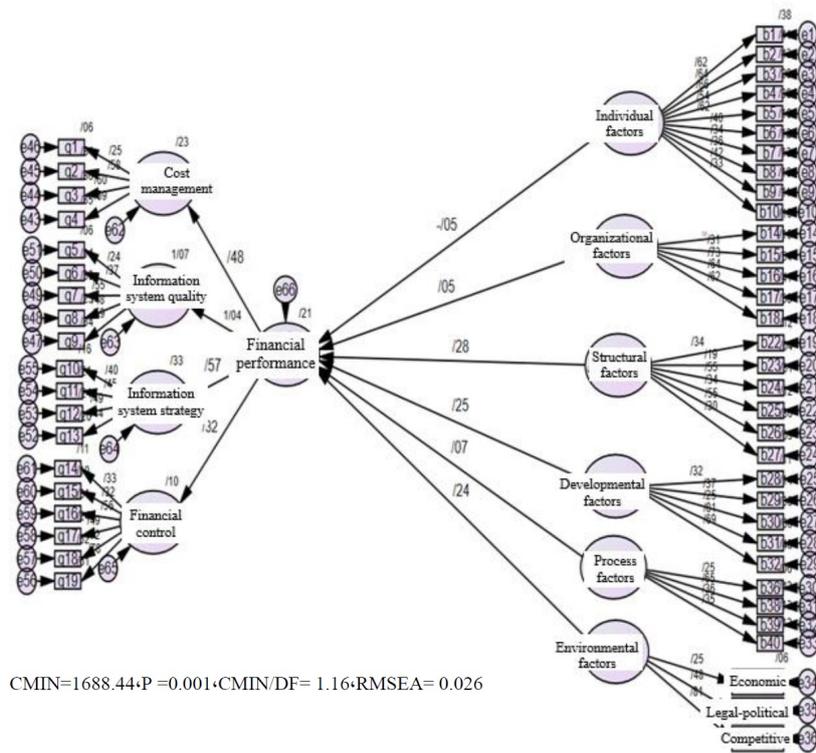CMIN=1688.44‹P =0.001‹CMIN/DF= 1.16‹RMSEA= 0.026

Figure 2: Structural model to test the sub-hypotheses of the research

Based on the results of Table 4 about the fit analysis of the model concerning fit indices, it can be stated that the factor analysis model has a good fit for testing the desired hypotheses. In other words, due to the good fit indices, this model can be used to investigate the effect of six variable components of non-financial criteria (individual, organizational, structural, developmental, process, and environmental factors) on the financial performance variable in the banking industry.

The results obtained from testing the above model show (Table 5) that the individual factors do not affect the variable of financial performance significantly ($P < 0.05, t = 0.67, \beta = 0.05$). Also, the results show that the organizational factors do not affect the financial performance variable significantly ($p < 0.05, t = 0.68, \beta = 0.05$). Also,

Table 4: The goodness of fit indices of the structural model of the research variables

The goodness of fit indices of the model	CMIN	DF	CMIN/DF	NPAR	P	GFI	AGFI	IFI	TLI	CFI	NFI	RMSEA
Fitted model	1688.44	1460	1.51	0.370	0.001	0.83	0.78	0.96	0.95	0.96	0.78	0.026
Desirable values	df=	–	3 <	–	0.05 >	0.90 >	0.90 >	0.90 >	0.90 >	0.90 >	0.90 >	0.08 <

the results show that the structural factors component positively and significantly affect the financial performance variable ($P < 0.05, t = 2.21, \beta = 0.28$). The results also indicate the positive and significant effect of the developmental factors component on the financial performance variable ($P < 0.05, t = 2.52, \beta = 0.25$). Additionally, the results show that the effect of the process factors component on the financial performance variable is not significant ($P < 0.05, t = 0.75, \beta = 0.07$). The results show the positive and significant effect of the environmental factors component on the financial performance variable ($P < 0.05, t = 2.21, \beta = 0.24$).

Table 5: Path coefficients of the effect of non-financial criteria components on the financial performance variable

Paths	Path coefficients		t-value	sig
	Standardized parameter	Non-standardized parameter		
Individual factors ← financial performance	-0.05	-0.02	-0.67	0.503
organizational factors ← financial performance	0.05	0.04	0.68	0.498
structural factors ← financial performance	0.28	0.23	2.21	0.027
developmental factors ← financial performance	0.25	0.20	2.52	0.012
process factors ← financial performance	0.07	0.07	0.75	0.453
environmental factors ← financial performance	0.24	0.46	2.21	0.027

Based on the information in Table 5 and Figure 2, the sub-hypotheses of the research are tested as follows:

Sub-hypothesis 1: Individual factors affect the bank's financial performance

The effect of individual factors on the bank's financial performance is not significant with a standard coefficient of -0.05 and a significance level of 0.503. Thus, based on the results, with 99% confidence, the opposite hypothesis was rejected and the null hypothesis was accepted. It means that individual factors do not affect the bank's financial performance.

Sub-hypothesis 2: Organizational factors affect the bank's financial performance.

The effect of organizational factors on the financial performance of the bank is not significant with a standard coefficient of 0.05 and a significance level of 0.498). Thus, based on the results, with 99% confidence, the opposite hypothesis was rejected and the null hypothesis was accepted. It means that organizational factors do not affect the bank's financial performance.

Sub-hypothesis 3: Structural factors affect the bank's financial performance.

The effect of structural factors on the financial performance of the bank is positive and significant with a standard coefficient of 0.28 and a significance level of 0.027. Thus, based on the results, with 95% confidence, the null hypothesis was rejected and the opposite hypothesis was accepted. It means that structural factors affect the bank's financial performance.

Sub-hypothesis 4: Developmental factors affect the bank's financial performance.

The effect of developmental factors on the financial performance of the bank has a positive and significant effect with a standard coefficient of 0.25 and a significance level of 0.012. Thus, based on the results, with 95% confidence, the null hypothesis was rejected and the opposite hypothesis was accepted. It means that developmental factors affect the bank's financial performance.

Sub-hypothesis 5: Process factors affect the bank's financial performance.

The effect of process factors on the bank's financial performance is not significant with a standard coefficient of 0.07 and a significance level of 0.453. Therefore, based on the results, with 99% confidence, the opposite hypothesis was rejected and the null hypothesis was accepted. It means that process factors do not affect the bank's financial performance.

Sub-hypothesis 6: Environmental factors affect the bank's financial performance.

The effect of environmental factors on the financial performance of the bank is positive and significant with a standard coefficient of 0.24 and a significance level of 0.027. Therefore, based on the results, with 95% confidence, the null hypothesis was rejected and the opposite hypothesis was accepted. It means that environmental factors affect the bank's financial performance.

4 Discussion

The results revealed that non-financial criteria positively and significantly affect the financial performance of the bank with a standard coefficient of 0.53 and a significance level of 0.001. Therefore, based on the results, with a 99% confidence, non-financial criteria affect the bank's financial performance. Quarem et al. concluded that disclosure of non-financial information affects the investors' decisions [9]. Also, Salem concluded that non-financial criteria are effective factors in examining the financial performance of Libyan banks. The results of these studies are consistent with those of the present study [24]. It was revealed that individual factors had no significant effect on the financial performance of the bank with a standard coefficient of -0.05 and a significance level of 0.503. Thus, based on the results, with 99% confidence, individual factors do not affect the bank's financial performance. Banker et al. concluded that customers' and employees' satisfaction affects the financial performance of institutions [3]. Ansari also concluded that the use of non-financial criteria affects job satisfaction. The results of these two studies are not in line with those of the present study [2]. The results revealed that organizational factors do not significantly affect the financial performance of the bank with a standard coefficient of 0.05 and a significance level of 0.498. Therefore, based on the results, with 99% confidence, organizational factors do not affect the bank's financial performance. Verbeeten et al. concluded that strategic priorities organizational culture and size affect the performance of organizations. The results of these two studies are not in line with those of the present study [26].

In a study of the service and non-service industries of Malaysia, Bontis et al. examined the relationship between intellectual capital and business performance. The mentioned study revealed that there were mutual relationships between the components of intellectual capital and these capitals had a relatively moderate effect on business performance of about 20 to 30% [7]. Rumanti et al. analyzed the effect of organizational culture on intellectual capital. The results revealed that dimensions of organizational culture positively and significantly affect intellectual capital [23]. The results also revealed that structural factors positively and significantly affect the financial performance of the bank with a standard coefficient of 0.28 and a significance level of 0.027. Thus, based on the results, with 99% confidence, structural factors affect the bank's financial performance. Kim and Hyun stated that customer-based strategy and advanced information technologies improve performance [17]. Also, Ansari et al. found that the criteria related to information technology, usefulness in daily tasks, reliability, accessibility, and compatibility are among the criteria affecting financial performance and are ranked first in terms of significance [2]. The results of these two studies are consistent with those of the present study. The results revealed that the effect of development factors on the financial performance of the bank was positive and significant with a standard coefficient of 0.25 and a significance level of 0.012. Therefore, based on the results, with 99% confidence, developmental factors affect the bank's financial performance.

Nobahar et al. used criteria such as total assets, financial leverage, capital adequacy, return on assets, number of bank branches, and bank reputation and concluded that these criteria will increase the bank's value and improve the bank's capital [21]. Andrew et al. also concluded that there is a significant relationship between the endogenous ownership structure, the size of the board of directors, the presence of corporate governance committees, the percentage of board members employed by other companies, and the company's CEO duality and financial decisions and company performance. These results are consistent with those of the present study [1]. It was also found that the effect of process factors on the bank's financial performance is not significant with a standard coefficient of 0.07 and a significance level of 0.453. Thus, based on the results, with 99% confidence, process factors do not affect the bank's financial performance. Bezazzadeh concluded that non-financial criteria based on internal processes do not affect the company's performance. The results of this study are consistent with those of the present study [6].

Finally, the results revealed the significant effect of environmental factors on the financial performance of the bank with a standard coefficient of 0.24 and a significance level of 0.027. Thus, based on the results, with 99% confidence, environmental factors affect the bank's financial performance. Bozdag et al. concluded that central bank rules, financial and accounting standards, management strategies, bank size, and competition affect the measurement of bank performance [8]. Salem found that criteria such as competitive environment, managers' knowledge, customer demand, the nature of the banking industry, managers' operational experience, and the new rules, and strategies of the central bank affect the financial performance of the banks [24]. The results of the mentioned study are in line with those of the present study. Kaplan and Norton suggest that annual profit has many problems for evaluating performance and other criteria such as product innovation, production management, employee satisfaction, employee skills, and customer orientation have better future resources than annual profit and create motivation in managers and employees. Also, the annual profit cannot measure all the economic activities of the company [15]. There are two types of relationships (direct and indirect) between non-financial criteria of performance evaluation and job satisfaction [5]. There is a consensus that non-financial criteria complement the shortcomings of financial criteria and non-financial criteria of performance evaluation solve the limitations of financial criteria. Like customer-oriented views, internal

processes, training, and learning growth of employees are among the long-term goals and have benefits that do not have a significant effect on the present [10, 12, 20].

5 Conclusion

Although the financial criteria are based on the historical price and have other disadvantages, these criteria are still at the heart of evaluating the performance of managers and are among the most widely used criteria. Owing to the limitations of financial criteria and the special conditions of the age of knowledge, it is inevitable to use also non-financial criteria. Although financial criteria include valuable information for users, they cannot evaluate the organization's performance in achieving goals in different dimensions. Thus, in addition to financial criteria, non-financial criteria such as customer demand, knowledge of managers, operational experience of employees, innovation, quality, etc., should also be considered in evaluating the bank's financial performance.

5.1 Recommendations

According to the results, the following recommendations are presented:

One of the factors that should be considered in the field of banking is to simplify banking services and processes so people can easily access and use all kinds of banking services.

Iran's banks are mostly designed in such a way that there is a communication gap between customers and employees. In this regard, it is recommended to provide a calm environment for employees by creating specialized counters in the form of work offices for employees so they can observe more interactions between employees and customers.

Banking services should be provided in various forms. In this regard, the use of several tools and providing training on how to use these tools should be investigated, designed, and implemented.

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