



The Most Effective Strategy to Improve Customer Satisfaction in Iranian Banks: A Fuzzy AHP Analysis

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Abstract

With the intense competition in banking systems, customer satisfaction has become more important issue in customer marketing. In existing studies, customer satisfaction has examined based on customers' viewpoint. This study investigates customer satisfaction based on viewpoint of bank managers who understand their customers' needs. This study aims to examine importance of various strategies that improve customer satisfaction and also determines their priorities. The results indicate that improving services and facilities is the most effective strategy to improve customer satisfaction in Iranian banks. In this strategy, interest rate and fair facilities are most important factors.

Keywords: Customer satisfaction, Banks, Bank managers, Fuzzy AHP, Iran.

Introduction

With increasing growth of banking systems, people have fewer limitations to choose their favorite banks. Because of this, one of the most challenging issues for bank managers is to maintain customers and enhance their loyalty. In recent decades, banking system has grown dramatically in Iran. For many years, there were only a few state-owned banks. Today, with entry of private sector to banking market, this unipolar system is fading and the number of banks has increased. With the growth of this market and availability of more banks for people or in other words, due to increasing of choice power, competition have increased among different types of banks and thus, customer marketing is more important than ever. With such competitive conditions, customers play a key role in banking systems (Bee Wah *et al.*, 2012). When banks are exposed to pressure of intense competition, they focus on retaining loyal customers (Terrence and Gordon, 1996). According to direct relationship between loyalty and customer satisfaction (Amin *et al.*, 2010; Lenka *et al.*, 2009b; Mohsan *et al.*, 2011; Ziaul Hoq and Amin, 2010), the most effective way to pass this important challenge is understanding people's expectations and then identifying possible and appropriate strategies and finally selecting the best strategy to provide more satisfaction for customers. Customer satisfaction is an important factor in business and its outcomes is a critical matter in banking system (Ahmad and Kamal, 2002).

Literature Review

Previous researchers have studied customer satisfaction in banks from different aspects. Mihelis *et al.* (2001) argue that customer satisfaction is a dynamic parameter in banks and also focuses on customer satisfaction measurement. They believe that measuring of customer satisfaction determine effectiveness of marketing plans in banks. The evaluation of customer satisfaction is not always in general. Sometimes, it is examined in bank transaction (Nicholls *et al.*, 1995). Winnie and Kanji (2001) Show direct and indirect relationship between perceived value and customer loyalty with customer satisfaction models. Some researchers (Cao *et al.*, 2011) focus on customer satisfaction process in one of bank services like call centers. In this research, customer satisfaction cannot be observed in the entire banking system and it examined in a particular case. This particular method is also seen in other researches. Abedniya *et al.* (2011) investigate the relationship between customers' perceived service quality and satisfaction with an emphasis on religion in the banking process. They state that expectations and demands of customers have been changed through technology improvement and expanding of communication tools. The modern services such as high e-service quality and e-banking lead to customer satisfaction (Herington and Weaven, 2009).

In general, bank automation has a direct relationship with bank customer satisfaction and subsequently it affects on bank customer switching behaviour and bank customer loyalty (Moutinho and Smith, 2000). Amudha *et al.* (2012) study the customer satisfaction toward quality of service. They state that customers don't perceive a good value for the products that they purchased, because the quality and usage of the products are not up to their satisfaction level. Other researchers (Ramdhani *et al.*, 2011) have paid to this issue (quality of service) and its relation with customer satisfaction in different banks. Amin *et al.* (2010) and also Ziaul Hoq and Amin, (2010) examine the role of customer satisfaction to enhance customer loyalty. Based on these researches, higher customer satisfaction leads to a lower customer tendency to switch banks. In other words, more satisfaction causes more trust and more trust causes more loyalty (Bee Wah *et al.*, 2012).

According to the study that conducted by Ghazizadeh *et al.* (2010), brand meaning indirectly and brand equity indirectly leads to customer satisfaction. Quality of service include competency, affability and efficiency of the staff enhance customer satisfaction (Norma, 2012). Another factor that can increase customer satisfaction is the bank's commitment to social responsibility (McDonald and Rundle-Thiele, 2008). Use of different aspects of quality management methods can lead to higher quality of service and higher customer satisfaction (Lenka *et al.*, 2009a). There are the other factors that lead to customer satisfaction include suitable location of the branch (Mishra *et al.*, 2010). Customer satisfaction has been studied with motivation-hygiene theory (Jin-fu and Long, 2012). Various affecting factors in case of customer satisfaction could classify in Herzberg two-factor theory, for example modesty and friendly behaviour as motivation factors and security and reliability as hygiene factors (Vazifehdoust and Hosseinzadeh Lotfi, 2012). Customer satisfaction has also positive relationship with organizational culture in banking industry (Kordnaeij *et al.*, 2012). Customer satisfaction has also economic consequences and affects on firm reputation and customer profitability (Yu, 2007).

Methodology

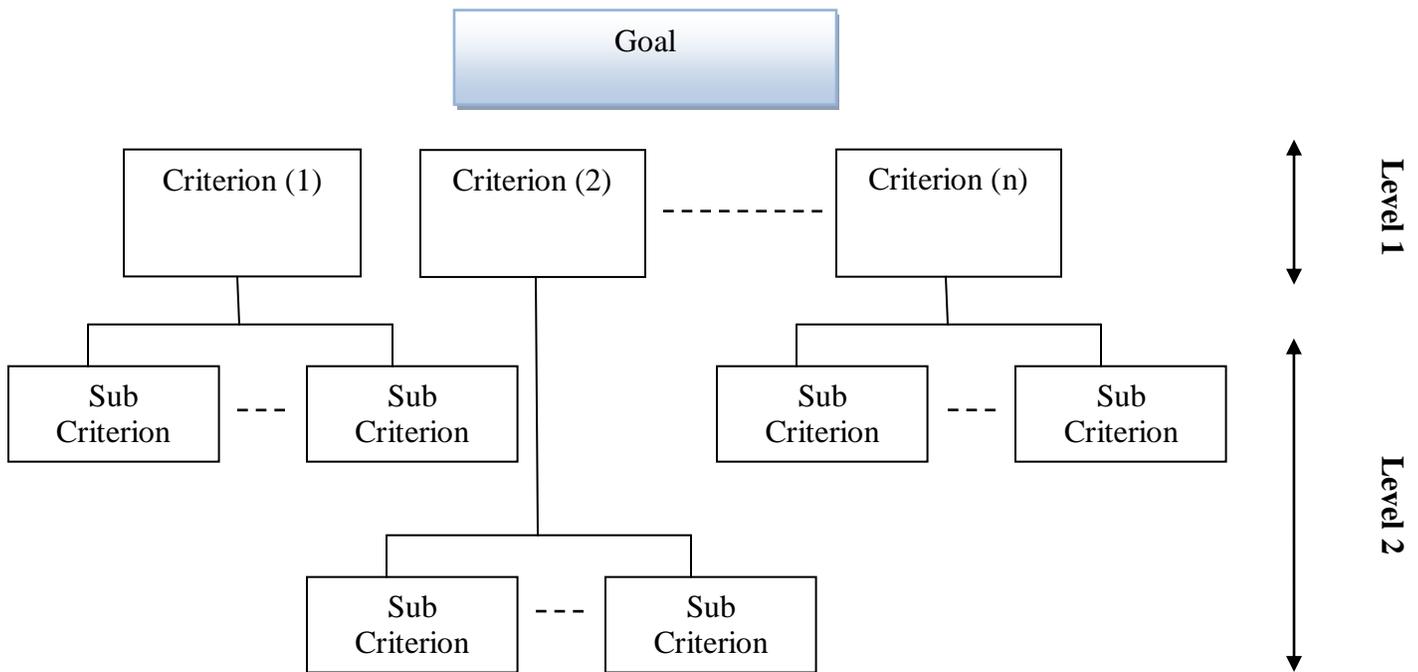
This research determines priorities and also calculates the importance of strategies that bank managers choose them to increase satisfaction among their customers. Since there are some criteria and sub-criteria and the aim is determination of priorities, Analytical Hierarchy Process (AHP) is found an effective method.

AHP is an useful technique for decision makers to rank information based on several criteria (Beynon, 2002). It also is a prominent management tool to support multi-criteria decision problems on several qualitative factors (Lee *et al.*, 2012).

Customer satisfaction is a mental concept and relates to personal experiences. This causes more uncertainty in managers' judgments and consequently in pairwise comparisons. Because of this, Fuzzy Analytical Hierarchy Process (F-AHP) is found more effective rather than AHP. In addition, selecting appropriate criteria and sub-criteria is necessary to reach more accurate results.

F-AHP hierarchical tree (figure 1) breaks down process into smaller elements and subsequently causes better understanding of relationship within and between each level. Each criterion in level 1 and sub criterion in level 2 is compared with the other in pairwise form to determining priorities.

Figure 1: F-AHP hierarchical tree



According to Extent Analysis (EA) method that introduced by Chang (1996), two triangular fuzzy numbers (TFN) is assumed:

$$M_1 = (l_1, m_1, u_1) \tag{1}$$

$$M_2 = (l_2, m_2, u_2) \tag{2}$$

These fuzzy numbers is shown in figure 2.

Mathematical operators are as follows:

$$M_1 + M_2 = (l_1 + l_2, m_1 + m_2, u_1 + u_2) \tag{3}$$

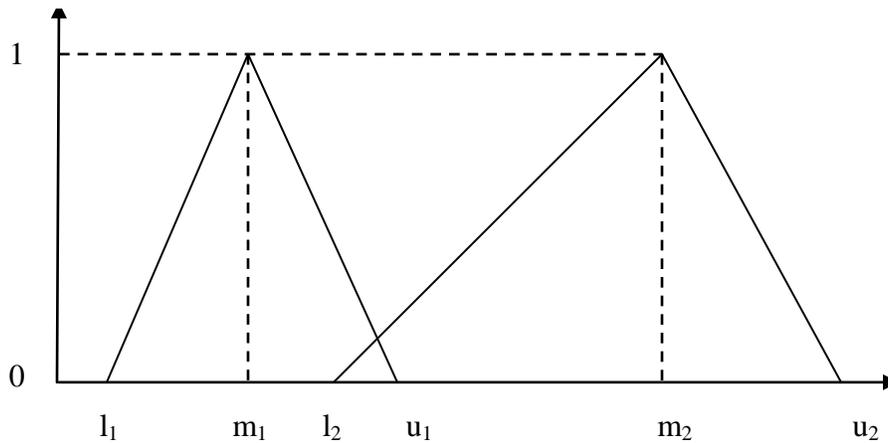
$$M_1 \cdot M_2 = (l_1 \cdot l_2, m_1 \cdot m_2, u_1 \cdot u_2) \quad (4)$$

$$M_1^{-1} = \left(\frac{1}{u_1}, \frac{1}{m_1}, \frac{1}{l_1}\right) \quad (5)$$

$$M_2^{-1} = \left(\frac{1}{u_2}, \frac{1}{m_2}, \frac{1}{l_2}\right) \quad (6)$$

Above equations are just approximation of product, sum and reverse of two triangular fuzzy numbers.

Figure 2: Triangle fuzzy number M_1 & M_2



According to verbal terms in questionnaire that must be considered in pairwise comparison matrix, an appropriate scale for conversion of those terms to fuzzy numbers is requiring. Triangular fuzzy importance scale is shown in table 1 (Tolga *et al.*, 2005, p. 101).

Table 1: Triangular fuzzy importance scale

Linguistic scale	Explanation	Triangular fuzzy scale	Triangular fuzzy reciprocal scale
Equal importance (EI)	Two activities contribute equally to the objective	(1,1,1)	(1,1,1)
Moderate importance (MI)	Experience and judgment slightly favor one activity over another	(1/2,1,3/2)	(2/3,1,2)
Strong importance (SI)	Experience and judgment strongly favor one activity over another	(1,3/2,2)	(1/2,2/3,1)
Very strong importance (VSI)	An activity is favored very strongly over another; its dominance demonstrated in practice	(3/2,2,5/2)	(2/5,1/2,2/3)
Demonstrated importance (DI)	The evidence favoring one activity over another is the highest possible	(2,5/2,3)	(1/3,2/5,1/2)

When $(l_{ijt}, m_{ijt}, u_{ijt})$ show the fuzzy evaluation of sample members t ($t = 1, 2, 3, 4, \dots, T$), geometric mean of all comparisons could be used as follows:

$$l_{ij} = \left(\prod_{t=1}^T l_{ijt} \right)^{1/t}, \quad m_{ij} = \left(\prod_{t=1}^T m_{ijt} \right)^{1/t}, \quad u_{ij} = \left(\prod_{t=1}^T u_{ijt} \right)^{1/t} \quad (7)$$

In EA method, value of extent analysis (S_i that is a triangle number) is calculated for all rows of pairwise comparison matrix with m rows and n columns:

$$S_i = \sum_{j=1}^n M_{ij} \times \left[\sum_{i=1}^m \sum_{j=1}^n M_{ij} \right]^{-1} \quad (8)$$

After that, possibility degree must be calculated. The possibility degree of M_1 to M_2 that we show it by $V(M_1 > M_2)$ is defined as follows:

$$\begin{cases} V(M_1 > M_2) = 1 & \text{if } m_1 \geq m_2 \\ V(M_1 > M_2) = hgt(M_1 \cap M_2) & \text{otherwise} \end{cases} \quad (9)$$

$$hgt(M_1 \cap M_2) = \frac{u_1 - l_2}{(u_1 - l_2) + (m_2 - m_1)} \quad (10)$$

Possibility degree of one TFN to other k TFN is obtained by below equation:

$$V(M_1 \geq M_2, \dots, M_k) = \text{Min}[V(M_1 \geq M_2), \dots, V(M_1 \geq M_k)] \quad (11)$$

For calculating weight of criteria in pairwise comparison matrix In EA method, we do as follows:

$$W'(x_i) = \text{Min}\{V(S_i \geq S_k)\} \quad k = 1, 2, \dots, n \quad k \neq i \quad (12)$$

Therefore, criteria weight vector is as follows:

$$W' = [W'(c_1), W'(c_2), \dots, W'(c_n)]^T \quad (13)$$

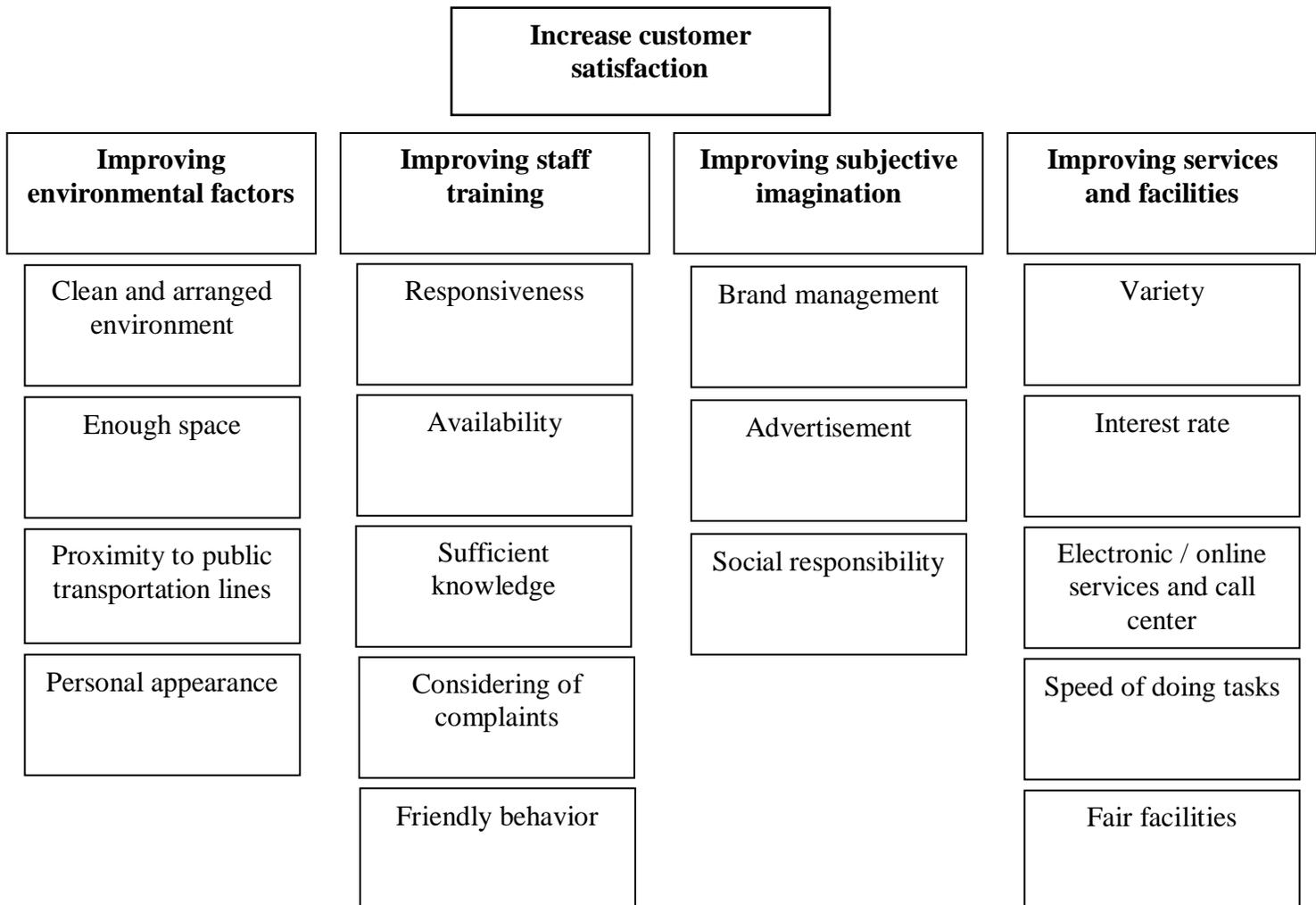
As previously mentioned, selecting appropriate criteria and sub-criteria is so important to achieve more accurate results. We set 4 criteria and 17 sub-criteria based on expert opinions (by interview) in Iranian banking system, viewpoint of bank managers (by interview) who have direct communication with their customers and understand their needs, previous researches (Abedniya *et al.*, 2011; Herington and Weaven, 2009; Mihelis *et al.*, 2001; Norma, 2012; Ramdhani *et al.*, 2011; Vazifehdoust and Hosseinzadeh Lotfi, 2012) that often show viewpoint of bank customers. Each of these criteria includes several sub-criteria (Table 2).

Table 2: Criteria and sub-criteria for FAHP model

Criteria	Sub Criteria
Improving environmental factors	Clean and arranged environment, Enough space, Proximity to public transportation lines, Personal appearance
Improving staff training	Responsiveness, Availability, Sufficient knowledge, Considering of complaints, Friendly behavior
Improving subjective imagination	Brand management, Advertisement, Social responsibility
Improving services and facilities	Variety, Interest rate, Electronic / online services and call center, Speed of doing tasks, Fair facilities

As previously mentioned, there are 2 levels in this F-AHP model, criteria (level 1), and sub-criteria (level 2).

Figure 3: Criteria and sub-criteria in F-AHP hierarchical tree



Results

50 questionnaires were delivered to bank managers; each questionnaire has 5 questions with 5 pairwise comparison charts. Comparisons were done with numbers that indicates verbal terms in Table 1. 15 questionnaires were not analyzable. Inconsistency ratio (IR) in 5 questionnaires was more than 0.1 and we returned 5 questionnaires to managers to review pairwise comparisons. Finally, 35 correct questionnaires (IR<0.1) were reached to analyzing step. For the final evaluation, since there were group comparisons, geometric mean of each individual evaluation was calculated with MATLAB software.

The values of fuzzy extent analysis with respect to criteria (level 1) are calculated as below:

$$S_{en} = (2.459, 3.053, 4.164). (0.043, 0.060, 0.081) = (0.107, 0.183, 0.339)$$

$$S_{st} = (3.392, 4.789, 6.697). (0.043, 0.060, 0.081) = (0.147, 0.288, 0.545)$$

$$S_{su} = (2.814, 3.778, 5.317). (0.043, 0.060, 0.081) = (0.122, 0.227, 0.433)$$

$$S_{se} = (3.611, 5.033, 6.826). (0.043, 0.060, 0.081) = (0.157, 0.302, 0.556)$$

The possibility degrees are calculated as below:

$$V(S_{en} \geq S_{st}) = 0.648, \quad V(S_{en} \geq S_{su}) = 0.833, \quad V(S_{en} \geq S_{se}) = 0.605$$

$$V(S_{st} \geq S_{en}) = 1, \quad V(S_{st} \geq S_{su}) = 1, \quad V(S_{st} \geq S_{se}) = 0.964$$

$$V(S_{su} \geq S_{en}) = 1, \quad V(S_{su} \geq S_{st}) = 0.825, \quad V(S_{su} \geq S_{se}) = 0.786$$

$$V(S_{se} \geq S_{en}) = 1, \quad V(S_{se} \geq S_{st}) = 1, \quad V(S_{se} \geq S_{su}) = 1$$

The minimum of possibility degrees for pairwise comparisons is calculated as below:

$$V(S_{en} \geq S_{st}, S_{su}, S_{se}) = \text{Min}(V(S_{en} \geq S_{st}), V(S_{en} \geq S_{su}), V(S_{en} \geq S_{se})) = 0.605$$

$$V(S_{st} \geq S_{en}, S_{su}, S_{se}) = \text{Min}(V(S_{st} \geq S_{en}), V(S_{st} \geq S_{su}), V(S_{st} \geq S_{se})) = 0.964$$

$$V(S_{su} \geq S_{en}, S_{st}, S_{se}) = \text{Min}(V(S_{su} \geq S_{en}), V(S_{su} \geq S_{st}), V(S_{su} \geq S_{se})) = 0.786$$

$$V(S_{se} \geq S_{en}, S_{st}, S_{su}) = \text{Min}(V(S_{se} \geq S_{en}), V(S_{se} \geq S_{st}), V(S_{se} \geq S_{su})) = 1$$

And criteria weight vector found as below:

$$W' = [0.605, 0.964, 0.786, 1]^T$$

After normalizing, weights of main criteria (level 1) are obtained:

$$W = [0.180, 0.287, 0.234, 0.298]$$

By the same calculations, priorities and importance weights of sub-criteria (level 2) with respect to environmental factors are obtained as below:

$$W = [0.267, 0.229, 0.262, 0.241]$$

Priorities and importance weights of sub-criteria (level 2) with respect to staff training are obtained as below:

$$W = [0.230, 0.173, 0.218, 0.184, 0.195]$$

Priorities and importance weights of sub-criteria (level 2) with respect to subjective imagination are obtained as below:

$$W = [0.31610, 0.31618, 0.36771]$$

Priorities and importance weights of sub-criteria (level 2) with respect to services and facilities obtained as below:

$$W = [0.1927, 0.2118, 0.1962, 0.1960, 0.2031]$$

Table 3: weights of factors for increasing customer satisfaction

Criteria (level 1)	weights	Sub-criteria (level2)	weights
Improving environmental factors	0.180	Clean and decent environment	0.267
		enough space	0.229
		Proximity to public transportation lines	0.262
		Personal appearance	0.241
Improving staff training	0.287	Responsiveness	0.230
		Availability	0.173
		Sufficient knowledge	0.218
		Considering of complaints	0.184
		Friendly behavior	0.195
Improving subjective imagination	0.234	Brand management	0.31610
		Advertisement	0.31618
		Social responsibility	0.3677
Improving services and facilities	0.298	Variety	0.1927
		Interest rate	0.2118
		Electronic / online services and call center	0.1962
		Speed of doing tasks	0.1960
		Fair facilities	0.2031

Conclusion

According to the results in Table 3, from view point of bank managers who interact with their customers and understand their needs, improving services and facilities is the most effective strategy (29.8%) to increase satisfaction among customers. In this criterion, interest rate and fair facilities are most important sub-criteria. The second effective strategy is improving staff training (28.7%). In this criterion, training staffs to be more responsiveness and increase sufficient knowledge of them are most important sub-criteria. The third effective strategy is improving subjective imagination (23.4%). In this criterion, commitment to social responsibility is the most important sub-criterion. The last effective strategy is improving environmental factors (18%). In this criterion, make a clean and decent environment and proximity of bank to public transportation lines are most important sub-criteria.

Totally, this study shows that in order to increase customer satisfaction, bank managers should focus on providing better services and facilities. Actually this is the most effective strategy. This could be achieved strongly by increasing interest rate and give fair facilities to customers. These results show that Iranian bank managers indicate that their customers are satisfied by economic services and also bank managers state that loan and facilities are not providing in a fair manner.

This classification of strategies for increasing customer satisfaction and determining their priorities is so useful for bank managers and policy makers in Iranian banking industry.

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