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Identifying and Ranking the Factors Affecting Customer Financial Behavior Using Multi-Criteria Decision Making Technique (TOPSIS)

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ABSTRACT

Customer relationship and recognition of the customer financial behaviour are considered as important strategic factors involved in successful performance of the banks. So, identifying these factors and prioritizing them help to make better decisions to complete the value chain of the banks' financial services, especially in development banks that tend to have midterm and long-time presence in financial markets. So, the present research aims to identify and prioritize the mentioned factors in Bank of Industry and Mine as one of the main development banks of Iran. The present research has been performed in two phases. In the first stage, or qualitative part, In the first stage, during the review of the literature and the opinions of banking experts, the relevant indicators were identified. In the second stage, or quantitative part, the statistical data of variables in the period of 2012-2017 was collected. Then, the identified factors were prioritized by multi-criteria decision making in TOPSIS solver software. According to the findings, environmental factors are the main indicators affecting the bank customers' financial behaviour. The most important customer-related factor was the definite profit paid to the customer; the most important bank-related factor was credit risk; and the most important environmental factor was economic growth.

1 Introduction

With the intensified competition and the increasing expectations of the customers, banks should pay much attention to the customers' needs by providing them with financial facilities for customer retention and observance of the bank's financial strategies. So, the effective factors in this area include the improvement of skills, transformation of attitudes, and proper way of service provision. Organizations and especially banks have found that customers are considered as their main asset. So, customer relationship and recognition of the customers' financial behavior are considered as key factors involved in the banks' success [14]. In this competitive atmosphere, the banks that are able to provide better services for the customers by recognizing their financial behavior will be successful. Regarding the resource limitation, development

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banks are exposed to a more serious risk. The difference between development and commercial banks is that development banks usually engage in risky investments with late return, while commercial banks are not so willing to engage in such investments [11, 19]. So, in order to efficiently allocate their resources to the customers, development bans should recognize the customers' financial behavior and adopt proper ways to evaluate that. The probable problem that can occur for development banks is the customers' negligence in reimbursement of facilities or delayed payment of them; due to the large number of the granted facilities, this situation can lead to the bank's bankruptcy. The bank customers set their financial behaviors including depositing, refraining from depositing, reimbursing, and failing to reimburse, etc. based on special factors. So, banks and financial institutions should be aware of the internal and external factors affecting the customers' financial behaviors and their priorities and adopt the necessary strategies to terminate the unsuccessful relationships [9].

The significance of the research is that by recognizing the factors affecting the customers' financial behaviors, banks can rank these factors for decision making and developing proper interactions with the customers. The consistent financial behavior of the customers of development banks will be significantly effective in successful achievement of their goals i.e. the long term development and growth of the country [20]. So, this research has both macro (the country) and micro (bank) goals. On the other hand, due to being affected by different factors such as environmental factors, bank-related factors, customer-related factors, and the customer behavior complexities, it is not easy to predict the customers' financial behaviors [28, 32, 33, 34]. The mentioned facts reveal the significance of the present research in the Bank of Industry and Mine as one of the most important development banks of Iran; because customer financial behavior seems to be different in development banks and commercial banks. Regarding the effect of behavioral factors on financial decisions and the necessity of recognition of the factors affecting the customer financial behaviors and their effect on decisions such as depositing, loaning, reimbursement, etc. the present research has got a higher significance.

2 Background and Literature

In organizations dealing with a large number of customers and clients (such as banks), the customers' behaviors are of a great importance. As their positive behaviors can help the organizations to achieve their goals, their negative and destructive behaviors can disturb the organizations' activities; it reveals the undeniable role of the customers in the organizations' performance. So, researchers have focused on studying the customers' behaviors and especially financial behaviors. Most of the previous financial-behavioral studies have been performed in stock exchange and they have investigated the investors' financial behaviors. However, a few studies that have investigated the customers' financial behavior are mentioned in the following. Sherfrin [25], from the University of Santa Clara, has written the book "Management of the Companies' financial behavior: decisions creating value". In this book, he has stated that investors pay more attention to the positive aspects of the past incidents than the negative incidents [24]. Bank customers' financial behaviors can include the criteria such as depositing, withdrawal, loaning, getting facilities, etc. Thomas [29] has defined customer financial behavior including the factors such as investment and on time reimbursement of the loans. Several researchers have discussed the importance of recognition of the customer financial behavior and some others have discussed developing banking strategies. Also, several studies have investigated the issue of providing bank services for the customers. Most of these studies have been performed based on the factors affecting the long term bank-customer

relationships, the customers' expected services, the priorities of the expected services, and in some cases, customer-oriented banking strategies. Guo et al. [8] mentioned the most important expectations of the bank customers as the reliability of banks, human capital, technology and communication, trust ability, equipment and facilities. Bedman [4] mentioned the most important criteria for the customers in choosing a bank as competitive price, availability of the facilities, and service quality. Schlesiger et al. [27] Reported that the most important factors involved in customer attraction in the banks include service price, access to the facilities, and the services provided for the customers. As a consistent study, Rosenblatt et al. [21] mentioned the most important factors as the range of services and the bank branches network. Audzeyeva et al. [1] performed a research titled "Prediction of the customer behavior in financial organizations", and they reported that the complexity of financial organizations with various services and the multi-dimensional nature of the customer behavior have created challenges for behavioral models. They studied the variables such as the customers' deposits, the paid loans, the average debt, the customers' revenue, the customers' age, and the duration of the bank-customer relationship. They studied the customers who had at least one active bank account over a three-year period. In this research, it was reported that the external factors such as the changes in the interest rates are also effective in customer behavior. This research was performed by simple and multivariate regression. The results showed that dynamic customers create more revenue changes in financial organizations. So, they should be separated from the other customers.
The researchers reported that by this investigation, institutions can preserve the favorable customers to develop their strategies. Siddique [26] performed a study titled "The factors involved in choosing a bank based on the customer preferences", and he found that financial factors are the most important factors involved in bank-customer interactions; while the other factors include the account interests and loaning. This research investigated 30 important factors by factor analysis. The results showed that some of the customers' preferences in their relationship with the bank include soft loan, low commission rate, and technology-based services. Due to the different demographic properties, the criteria of choosing a bank may be different in every region. Turnball and Gibbs [30] proved that service quality and variety, provision of facilities, the customers' comfort in the bank environment, service commission, the clerks' skill and specialty, the bank reputation, international banking, and flexibility are the factors involved in customer financial behavior. Zholud et al. [30] showed that the banks provide more facilities during the period of boom and decreased uncertainty of the macro economy, and they provide fewer facilities during the recession periods. However, these environmental factors and the macro economy have an indirect effect on customer financial behavior. Micco and Panizza [15] investigated the question "How does bank ownership affect the banks' loaning behavior in different periods in developed and developing countries?" They also investigated the banks' loaning behavior in terms of the loan growth rate in every country. They found that loan growth is related to the macroeconomic shocks measured based on the gross domestic production (GDP); so that every percent of the increase (decrease) of GDP has led to 1.46% increase (decrease) of the banks' loaning rate.
Niraula [17] performed a research titled "The banks' financial behavior under crisis", and he reported that in companies with an unsustainable political and economic situation, investors make more wrong financial decisions, and on the other hand, a larger number of financial institutions appear in such situations. So, the banks are faced with an intense competition. The research was done by using a questionnaire and based on descriptive statistics. It showed that the solutions proposed to the banks and financial institutions based on financial behavior methods help them to not only preserve their current customers, but also attract more new customers and prevent some of the investors' wrong decisions. Proenca and De Castro [18] suggested

that the banks and the related institutions form close poles by their joint goals and in this way, they provide optimal services for the customers. In this regard, they mentioned the relationship-based and transaction-based strategies as the two major strategies of providing service for the customers and increasing their deposits. Irena et al. [10] suggested that the banks provide a wide range of financial and credit service, etc. in the form of a comprehensive program. Lee et al. [13] performed a research titled “The cooperating bank’s behavior, uncertainty of the economic policies and decisions of financial institutions”, and they found that under uncertain conditions, the bank managers are so conservative and they adopt a similar monetary policy; also in such conditions, they adopt a similar loaning procedure. Sanchez et al. [23] reported that the environment affects the financial behavior of each company and its reactions to the performance of the cooperating companies in different ways. They found that factors such as the company size, the used technology, the company’s record, reputation, regional properties, and availability of adequate information about the companies’ financial behavior can affect the financial behavior and decisions.
Kosak et al. [12] performed a research titled “The adequacy of the bank capital and the banks’ loaning behavior during the global financial crises”. They found that the customers’ deposits and interbank deposits are considered as the banks’ financial resources. These deposits have a positive effect on loaning. This research was done by an experimental and regression model with a powerful standard error coefficient. It was found that the economic environment has a major effect on capital attraction and the banks’ financial risks originate from the inadequate capital and debts. Also, credit factors (such as the economic growth rate and interest rate) are effective in the banks’ financial behavior and loaning policies. Vinh et al. [31] performed a research titled “The banks’ loaning behavior in development countries”, and they found that in developing countries, a large sum of the government’s financial resources is allocated to development banks in order to help the economic growth. This situation leads to providing a large number of credits. In this research, loaning growth has been mentioned as an important indicator of the banks’ financial behavior and proper loaning and resource allocation in order to increase the productivity and economic growth. So, it is so important to get a true understanding of the economic environment including its effective variables such as capital adequacy, GDP, and recognition of the banking system for management of the public banks. In this research, the data of the period of 2006-2015 in the selected banks were studied by econometrics. It was concluded that the banks’ loaning behavior vary based on the macroeconomic factors and it is related to the decisions and financial behavior of the senior managers. Deku et al. [6] found that during the financial crises, the banks are faced with more risks and they use the benefits of securities in order to increase the profitability.
Some research studies have been conducted in Iran, in the field of behavioral finance model, but a few of them examined the case of bank customers, especially the customers of developing banks. Gorjizadeh and Khan Mohammadi [7] conducted a study entitled "Study the effect of behavioral finance factors on the decisions of individual investors". Their research shows that, whether measurable and non-measurable, micro and macro factors affect the financial behavior of investors. They examined that in addition to the biases and psychological factors of investors, other factors such as the economic environment affect their financial behavior. They measured the relationship between variables using multiple regression analysis method. The results showed that factors such as the amount of income, savings of investors, current return earned on the stock exchange, and some other factors had the greatest impact on the financial behavior of investors. Safari and Rafati [22] in their research on the impact of economic factors on the volume of bank deposits, high inflation has been introduced as one of the obstacles to the success of banks in attracting people's savings. In their research, they stated that it has been theoretically proven that if the interest on

bank deposits decreases following the reduction of interest rates on facilities, and This should not compensate for the devaluation of the depositor's money, i.e. it should be lower than the inflation rate, it should logically cause the deposits to leave the banks and transfer them to unorganized monetary markets (usury); That is, the capital market or markets such as currency, gold, housing, etc.

3 Modeling Background

Since 1970, the researchers have focused on multi-criteria decision models (MCDM) for making complex decisions. Hence, in this study the main focus of the methodology is based on MCDM models.

3.1 Multi-Criteria Decision Making Models

In such decisions, instead of only one criterion, several criteria are used for evaluating the optimality. As a general definition, multi-criteria decision making refers to special preferential decisions such as evaluation, prioritization, or selection out of the existing choices that are sometimes based on several contradictory criteria. Every problem can have multiple goals or multiple criteria. The criteria may be in conflict with each other. Different targets and criteria may have different scales. Such problems can be solved by either developing the best answer or choosing the best one out of the existing choices. Multi-criteria decision models are chosen depending on a special situation, the research goal, and the data accuracy and reliability. One of the multi-criteria decision making models is TOPSIS that is a powerful method for prioritizing the choices by simulation of the ideal answer. In this method, the selected choice should be the closest one to the ideal answer and the farthest one from the most inefficient answer.
This model was first proposed by Hwang and Yoon in 1981 and with the modifications, it became known as one of the best and most accurate methods of multi-criteria decision making. This method has powerful theoretical bases compared to the other multi-criteria decision making methods; so that it has solved many problems such as the numerical taxonomy. The theoretical foundations of this method are based on the following relationship: first, the positive ideals (the most efficient answer) and the negative ideals (the most inefficient answers) are calculated for each of the criteria and then, the distance of each choice from the positive and negative ideals is estimated. The selected choice is the one with the shortest distance from the positive ideals and the longest distance from the negative ideals. In this method, the type of the criteria in terms of having a positive or negative effect on the decision making goal can be included in the model with the weights and importance levels of each of the criteria [2]. This method is used when there is a limited number of indicators and information pieces available.

3.2 TOPSIS Mathematical Model and Ranking the Variables

After recognizing the criteria and indicators of the factors affecting the bank customers' financial behavior, the criteria are ranked by TOPSIS in the following stages.

First step: Getting the decision matrix

$$D = \begin{matrix} & x_1 & x_2 & & x_j & & x_n \\ A_1 & x_{11} & x_{12} & \dots & x_{1j} & \dots & x_{1n} \\ A_2 & x_{21} & x_{22} & \dots & x_{2j} & \dots & x_{2n} \\ \vdots & \vdots & \vdots & & \vdots & & \vdots \\ A_j & x_{i1} & x_{i2} & \dots & x_{ij} & \dots & x_{in} \\ \vdots & \vdots & \vdots & & \vdots & & \vdots \\ A_m & x_{m1} & x_{m2} & \dots & x_{mj} & \dots & x_{mn} \end{matrix}$$

Where, A_i is the ith choice and X_{ij} is the value obtained for the ith choice with the jth index.
In this matrix, profit is the index with a positive optimality and cost is the index with a negative optimality.
Second step: Quantification and unscaling the decision matrix (N): the matrix is unscaled by norm unscaling. In this step, the scales of each matrix are unscaled. So, each of the variables is divided by the vector of the same index. So, each of the entries (r_{ij}) is obtained by the following relationship.

$$r_{ij} = \frac{x_{ij}}{\sqrt{\sum_{i=1}^{m} x_{ij}^2}}$$

The third step: Getting the weighted unscaled matrix (V): decision matrix is a parameter that can become quantitative. For this purpose, the decision makers determine a weight for each index. The sum of the weights (W) is multiplied with the normalized matrix (R).

$$W = (w_1 , w_2 , \dots , w_j , w_n)$$

$$\sum_{j=1}^{n} w_j = 1$$

$$V = \begin{bmatrix} v_{11} & v_{12} & \dots & v_{1j} & \dots & v_{1n} \\ \vdots & \vdots & & \vdots & & \vdots \\ v_{i1} & v_{i2} & \dots & v_{ij} & \dots & v_{in} \\ \vdots & \vdots & & \vdots & & \vdots \\ v_{m1} & v_{m2} & \dots & v_{mj} & \dots & v_{mn} \end{bmatrix} = \begin{bmatrix} w_1 v_{11} & w_2 v_{12} & \dots & w_j v_{1j} & \dots & w_n v_{1n} \\ \vdots & \vdots & & \vdots & & \vdots \\ w_1 v_{i1} & w_2 v_{i2} & \dots & w_j v_{ij} & \dots & w_n v_{in} \\ \vdots & \vdots & & \vdots & & \vdots \\ w_1 v_{m1} & w_2 v_{m2} & \dots & w_j v_{mj} & \dots & w_n v_{mn} \end{bmatrix}$$

The fourth step: Determining the positive ideal and the negative ideal: the positive ideal and the negative ideal are defined as the following:

(V^+_j) the positive ideal solution = [V the vector of the best values of each index]
(V^-_j) the negative ideal solution = [V the vector of the worst values of each index]

$$\textit{the positive ideal choice } A^+ = \left\{ \left(\max_i v_{ij} | j \in J \right), \left(\min_i v_{ij} | j \in J' \right) | i = 1, 2, \dots, m \right\} = \{ v_1^*, v_2^*, \dots, v_j^*, \dots v_n^* \}$$

$$\textit{the negative ideal choice } A^- = \left\{ \left(\min_i v_{ij} | j \in J \right), \left(\max_i v_{ij} | j \in J' \right) | i = 1, 2, \dots, m \right\} = \{ v_1^-, v_2^-, \dots, v_j^-, \dots v_n^- \}$$

The best value of the positive indexes is the largest value allocated to that index for the different options of the weighted unscaled matrix. For the negative criteria, this value is the lowest allocated value. In determining the solution, the negative ideal is reversed.

The fifth step: Determining the distance of each choice from the positive and negative ideal solutions. This distance can be calculated by Euclidean distance or orthogonal distance. The Euclidean distance of each choice from the positive ideal and the negative ideal is calculated by the following formulas:

$$d_i^+ = \sqrt{\sum_{j=1}^{n} \left(v_{ij} - v_j^+\right)^2} \quad , i = 1, 2, \dots, m$$

$$d_i^- = \sqrt{\sum_{j=1}^{n} (v_{ij} - v_j^-)^2} \quad , i = 1, 2, \dots, m$$

Determining the proximity coefficient of each choice (CL^*) to the ideal value:

$$CL_i^* = \frac{d_i^-}{d_i^- + d_i^+}$$

$$0 < C_{i*} < 1$$

The closer is a choice to the ideal solution, the closer it will be to 1.
The sixth step: Ranking the choices; the choice with the largest CL is considered as the most optimal one. For this purpose, the relative distance of the choices from the ideal value is calculated and they are ranked in a descending order. The choice with the highest relative distance is assigned the highest rank [16].

4 Methodology of the Research

In terms of purpose, the present research is an applied one, and in terms of data collection, it is a descriptive survey study. Data collection has been done based on the credited information resources of the Bank of Industry and Mine over the period of 2012-2017. The research has been performed in two phases:

Phase 1: Library studies/in-depth interview

In the qualitative phase, the population includes the banking experts and, staff managers, and the branch heads of the Bank of Industry and Mine. The samples were selected by convenience sampling. So, 20 experts were selected for the in-depth interview and recognizing the variables. Also, the available resources were also investigated to recognize the customer financial behavior.

Phase 2: Quantitative study/multi-criteria decision making techniques

In the quantitative phase, the data of the period of 2012-2017 were extracted from the financial records of Bank of Industry and Mine. Then, the data were arranged in a relative manner by dividing them into the largest number of the mentioned period; so that, the data could be compared in terms of proportional criteria, and the sub-criteria of each of the factors identified in the customer financial behavior could be ranked on this basis. Therefore, the main data analysis method employed in this research is TOPSIS.

4.1 Measuring the Variables

As stated in the previous section, first the dimensions of the factors affecting the customers' financial behavior in the Bank of Mine and Industry were identified by in-depth interviews with experts banking

headquarters and library studies in the form of criteria such as bank specific factors, customer specific factors and environmental factors. The results are presented in Table 1. In this study, these criteria and sub-criteria have the greatest impact on the financial behavior of customers in development banks.

Table 1: The criteria and sub-criteria of the factors affecting the bank customers' financial behavior

Criterion	Sub-criteria	Resource
Bank-related factors	- The commission fee received from the customer - The per capita staff training - The bank's credit risk based on the gross debt balance - Information technology costs in software and automation - The attracted resources except the customers' deposits	[15]
Customer-related factors	- The total balance of the current account and the customers' short-term deposits - The exact profit paid to the depositors - The customers' geographical distribution - The number of the customers' electronic transactions - The average duration of the customers' cooperation	[15]
Environmental factors	- Liquidity growth rate - Inflation rate - The common interest rate - Per capita revenue - Currency rate - The return of the stock exchange index - Economic growth rate (the GDP growth) - Oil export	[5, 3, 14]

4.2 Ranking the Variables

As already stated, the factors affecting the customer financial behavior in this research include: bank-related factors, customer-related factors, and environmental factors. Table 2 presents the criteria ranked based on TOPSIS and the six mentioned steps. As seen in the Table, the environmental and macroeconomic factors have the strongest effects on the bank customers' financial behavior.

Table 2: Ranking the identified criteria

Criteria	Weights	Priorities
Environmental factors	0.4587	1
Customer-related factors	0.3698	2
Bank-related factors	0.1714	3

According to Table 2 and Fig. 1, the customers have mainly paid attention to the macroeconomic and customer-related factors. In other words, even if the bank mainly emphasizes the bank-related criteria and sub-criteria (for example, improvement of the staff training or service commission) and has not met the environmental, customer-related, and macroeconomic factors, the customers will not interact with the bank.

4.3 Ranking the Sub-Criteria

Tables 3, 4 and 5 present the weights and priorities of each of the sub-criteria of the different criteria.

Table 3: Ranking the customer-related sub-criteria

Sub-criteria	Weight	Rank
The exact profit paid to the depositors	0.6155	1
The customers' account balance	0.136	2
The average duration of the customer's cooperation	0.1192	3
The customers' electronic transactions	0.1174	4
The customers' geographical distribution	0.012	5

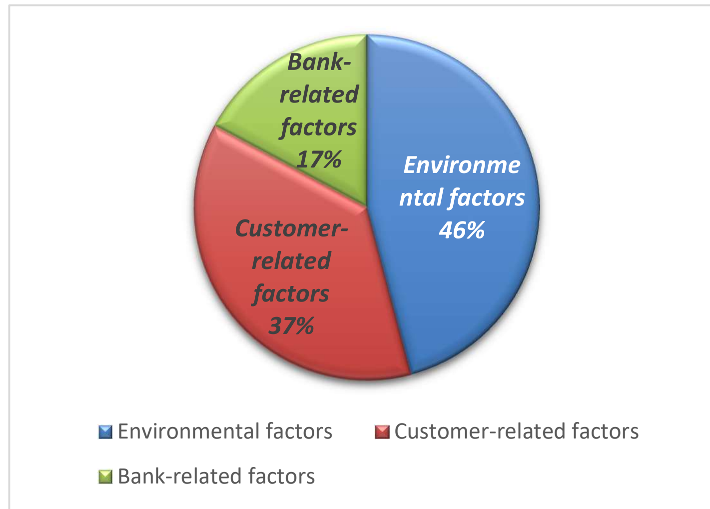

Fig. 1: the weight of factors affecting the customer financial behavior in this research

Table 4: Ranking the bank-related sub-criteria

Sub-criteria	Weight	Rank
Credit risk	0.3469	1
Information technology	0.3462	2
The attracted financial resources	0.1862	3
The per capita staff training	0.112	4
The received commission fee	0.0086	5

Table 5: Ranking the environmental sub-criteria

Sub-criteria	Weight	Rank
Economic growth	1.0851	1
Stock exchange return	0.036	2
Currency rate	0.0161	3
Inflation rate	0.016	4
Liquidity	0.0066	5
Oil export	0.0066	6
Interest rate	0.003	7
Per capita revenue	0.0009	8

As seen in the above Tables and Figure, the factors affecting the customer financial behavior in the Bank of Mine and Industry have been ranked based on TOPSIS method. The results showed that among the customer-related factors, the exact profit paid to the depositors (the customers' revenue obtained from the

bank) has got the highest rank; while the least important sub-criteria were the customers' geographical distribution (lifestyle). Among the bank-related factors, credit risk has got the highest rank; while the commission received from the customers has got the lowest rank. Among the environmental factors, economic growth has got the highest rank and the per capita income has got the lowest rank. It is worth mentioning that in terms of the role of environmental and macroeconomic factors in the customers' financial behavior, the results of this research are consistent with the findings reported by Zholud et al. [30] and Micco and Panizza [14].

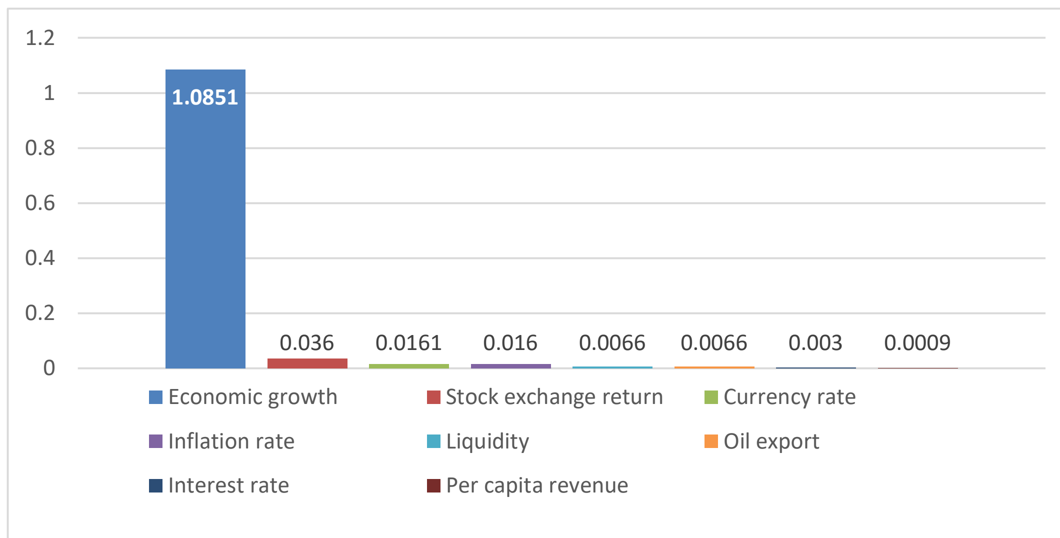

Fig. 2: the weight of factors affecting the environmental sub-criteria

5 Conclusion and Suggestions

As the present research has been performed in a development bank, it seems that both the bank and customers have been less affected by the other macroeconomic factors (currency rate, inflation rate, etc.), and they have been mainly affected by the economic growth in the country; i.e. whenever the economic authorities have stimulated the economic growth, they have been forced to provide less expensive financial resources (than the other environmental and macroeconomic factors) for the banks and customers. In other words, the customers' financial behavior has been affected by the government's economic decisions. Accordingly, it can be stated that bank-related and customer-related factors have not had any significant effect on the customers' financial behavior in this research. However, the intervening environmental variables and especially macroeconomic factors have significantly affected customer financial behavior. It suggests that in Iran, customer financial behavior is mainly affected by macroeconomic variables and the policies of economic managers.

So, it should be considered by the bank managers and the economic authorities. Regarding the economic growth rate presented in Table 5, it can be stated that since a major part of the financial resources of development banks is supplied by the government, the customers' financial behavior is affected by macroeconomic factors and especially the economic growth. According to this Table, it is suggested to conduct similar studies in other development or commercial banks to compare and analyze the results. Regarding the low ranks of currency rate and interest rate in Table 5, it can be argued that over the studied

period, the mentioned rates have not been real ones; because with the current profit rates declared by the banks, many customers have applied for a loan and other bank services. This condition suggests the insignificant effect of the mentioned rates on customer behavior; because the real facility rates were not explored in financial markets. So, regarding the large number of loan and service applications by the customers, bank managers should seek for solutions to increase the efficiency and decrease the risks under economic fluctuations. This is because Iran is one of the countries that face high risk of inflation, changes in the stock index, etc. that have an immense influence on the financial behavior of customers. So, it is suggested for the banks to regularly control the macroeconomic condition, and the government and the Central Bank are also suggested to use controlling policies to decrease the macroeconomic inconsistency, especially in the inflation rates and currency rates.

The damaging consequences of macroeconomic inconsistency can affect the customer financial behavior, loaning behavior, and decrease the investments and economic growth in long term. It also seems that if banks suppose stable macroeconomic conditions, they will expect borrowers to be able to repay their debts, as their forecast in these conditions indicates a good return on investment projects. So it seems banks to pay attention to the profitability of stocks on the stock exchange in order to reduce their claims in the time period of sanctions reduction, and to pay more attention to the certification of stocks of companies listed on the stock exchange in order to revive their claims at maturity. The banks are suggested to focus on customer-related factors under economic booms. In such conditions, bank can take effective measures to improve the electronic banking and increase their exact profit. On the other hand, development banks can decrease their credit risks by customer interaction regarding the customers' behavior and monitoring their loaning records. Among the bank-related factors in Table 2, studies have suggested the staff training as the most effective factor on customer behavior. However, the results of the present study showed that credit risk has the highest rank. In addition to the customers' viewpoint towards the bank, credit risk refers to the extent to which the bank observes the financial and banking principles to create a sustainable income and business. In terms of banking issues, avoiding bankruptcy is prioritized in commercial and development banks and other profit financial institutions.

It suggests that development banks pay much attention to their credit risks to prevent bankruptcy. It means that in development banks, observance of the financial and banking principles is related to validation of the customers, loaning, granting other bank services, and receiving the debts. Among the customer-related factors in Table 3, studies have suggested the duration of cooperating with the bank and the customers' geographical distribution as the most effective factors involved in customer behavior. However, the results of the present study showed that the profit paid to the customer i.e. their revenue obtained from the bank is the most effective factor involved in interaction of the customers with development banks. It should be noted that the managers of development banks should regard the fact that a group of their customers tend to business activities. So, it is suggested for the banking researchers to conduct similar studies in other development banks to compare the results with the findings of the present research.

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