Evaluating Effective Criteria and Indicators in Marketing Management to Absorb Liquidity in Bank Saderat Iran Using AHP Model

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A R T I C L E   I N F O

A B S T R A C T

The present study aimed to study effective criteria and indicators in marketing management to absorb liquidity in Bank Saderat Iran using AHP model. Delphi technique was used to identify important and effective parameters in absorbing liquidity. Multiple criteria decision-making and AHP models were used to prioritize criteria of the present study. Statistical population included all experts and senior experts in the field under study. A group consisting of 10 individuals was used in Delphi technique. A group consisting of 30 experts was used as sample in analytical hierarchical process. Questionnaire was the main tool to collect data. Three questionnaires were used in this study. Delphi questionnaire was used for screening and final classification of criteria. Expert questionnaire was used to prioritize criteria of liquidity management questionnaire based on main criteria of communications matrix questionnaire. Then, certain strategies for final prioritization of strategies to absorb liquidity were prepared and designed. Excel software was used to analyze the data collected from Delphi and TOPSIS techniques while Super Decision software was used to conduct AHP technique. The results showed that important and main indicators of appropriate liquidity management are as follows: proper structure of the organization, proper resources management, management information system, adequate training to colleagues, liquidity provision tools, imposing communicated policies of the central bank, financial markets securities, capital markets securities, granted facilities, investments and partnerships, received credit and loan, unexpected withdrawals of stakeholders' capital, current deposits, savings deposits and investment deposits. Prioritization of identified criteria using AHP technique showed that indicator of unexpected withdrawals of stakeholders' capital has the highest priority. Indicator of communicates policies of the central bank has the second priority. Indicator of savings deposits has the third priority. Indicator of investment deposits has the fourth priority. Indicator of current deposits, proper management of resources, indicator of investment and partnerships and indicator of adequate training to colleges are the next priorities. Finally, indicator of granted facilities has the least priority.

INTRODUCTION

Liquidity management refers to ability of the Bank to commit to its financial obligations over time. Liquidity management is performed at several levels. Liquidity management requires identification of both risks and changes due to environmental variables. Liquidity risk is identified by the managers as an indicator of liquidity management and control (Darabi and Mowla'ii, 2011, 28). If banks increase their investment in various sectors of the economy, the economic sectors will encounter less problems in manufacture, storage, distribution and sale and reinvestment processes. Thus, resource management is considerably important, especially cash. Cash management means maintaining optimum cash (not least - not much) at the right time (Roosta, 2008). The Central Bank once announced that banks should focus more on liquidity, resources and cash management and regulation. Then, the banks can merely benefit from their own mobilized resources in granting facilities. Then, they should avoid using resources of the central bank. Then, importance of liquidity management is more than ever. On the other hand, banks are uncertain how to choose the optimum strategy in dealing with liquidity management due to various risks (operational, credit, market and legal) as well as discussion on issues related to privatization and profit. Then, if the goal of resource mobilization is profitability, the goal should also be set

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based on collecting cheap resources. Then, the banks would encounter risk of non-sustainable resources such deposits. Conversely, if the goal is set to reduce risk, the banks should start to collect the resources and deposits, which are more stable (term deposits). This is associated with an increase in operational costs (Ahmad Pur, 2008, 55)

Liquidity management issue is very important in most banks around the world because it may lead to bankruptcy in the worst case. In banking activities, deadline of granted obligations is long-termer than deadline of deposits or liabilities. This inconsistency in deadline of payments and receipts may cause the bank to not be able to pay debts on deadline. Thus, it may lead to inappropriate liquidity management (Venus, 2005). Bank Saderat Iran is one of commercial banks, which often encounters such problems as optimal management of liquidity within the country. Studies showed that lack of liquidity in different years led Bank Saderat Iran indebted to the central bank of Islamic Republic of Iran and other banks during the past years. This imposed enormous costs on the bank. It should be noted that maintaining over needed liquidity not only prevents the bank to benefit from investment opportunities but also to earn more income. Applying proper liquidity management practices will lead to profitability and appropriate performance of the bank. Applying proper liquidity management practices generally depends on two categories of external and internal factors. In this study, proper liquidity management is considered as dependent variable while external and internal factors are considered as independent factors (Hassanzadeh, 2010).

An efficient banking system is one of the effective tools for economic development. Nowadays, bank is considered as one of the most important economic sectors. Banks mobilize small and large savings and channel them into productive, commercial, and non-productive enterprises. Then, immobilized investments are turned into mobilized factors. On the other hand, production factors, which are either unemployed or less productive due to lack of capital, are turned into full employment or high productivity (Karami, 2008). Finally, banks, as an important factor in monetary policy, are executives who take economic decisions for the central banks. Any practice to improve the banking system will also improve savings, investment and resource allocation. Regardless of main function of every banking system at macro level, i.e. mobilizing, optimal allocation of financial resources to economic activity encourages the banks to grant loans and be profitable (Rostamian and Haji Babaei, 2009).

Therefore, banks face greater risks by earning more profit. Liquidity risk is one of the major risks that threaten banking system. This shows lack of appropriate liquidity management system. Accordingly, the concept of liquidity management of banks is turned into one the most fundamental concepts in risk management in banks.

The present study evaluated effective criteria and indicators in marketing management to absorb liquidity in bank in case study of Bank Saderat Iran. In addition, AHP technique was used to accomplish research goals.

MATERIALS AND METHODS

The present study aimed to evaluate effective factors in marketing management to absorb liquidity in Saderat Bank using AHP and TOPSIS techniques. This is an applied research considering the goal of the research. In this study, library and survey methods such as questionnaires were used. It can be noted that the present study is descriptive - survey considering the nature and method. In the present study, industrial engineering and research approaches were used in operation. Statistical population included all experts and senior experts in the field under study. In phases under study, expert group was determined based on technique used. In the first phase, a groups consisting of 10 individuals was used to identify and screen main criteria of Delphi technique. In the second phase, fuzzy AHP technique was used to prioritize main criteria using 30 experts as sample. In the final phase, a team of experts was used to evaluate relationships based on communication matrix and TOPSIS technique.

Multi-criteria decision-making techniques such as AHP and TOPSIS were used to prioritize main criteria and select an optimal option to accomplish the research goal. Sa'ti (2002) argues that ten experts are adequate for studies based on pairwise comparison (Ghodsi poor, 2008). In this study, 30 experts of Tejarat bank were used as sample.

Data was collected by participating in weekly meetings of marketing committee on liquidity management in Tejarat Bank. Marketing Committee members of liquidity management were senior managers of units and agencies involved in proper liquidity management marketing in Saderat banks. Issue set forth in meetings of committee of Bank's liquidity management marketing were studied and interpreted thoroughly. Then, research topic, hypotheses and theoretical studies were discussed. Moreover, journals, books and dissertations relevant to this area were used.

In general, methods for data collection are divided into two categories of library and field methods in this study. Library method was used to collect data on literature while field method was used to collect data to accept or reject the research hypotheses. Interview and questionnaire tools were used to collect data. Expert Questionnaire was used as the main questionnaire. Expert questionnaire was used to prioritize the main criteria,

select the method and conduct the research using techniques based on pairwise comparison such as AHP. These tools were developed based on nine-degree o'clock scale.

Validity and reliability of data collection:

      It is essential that the researcher be relatively assured of reliability, validity and application of the desired tool practically. Therefore, the validity and reliability of the tools used in the study should be examined

      In this study, group analytical hierarchical process was used to determine the weight of model variables according to paired comparisons questionnaire results based on nine o'clock scale. This is a scientific approach adopted by many researchers. This questionnaire has appropriate logical and content validity to determine relative weights of the variables (Mehregan, 2008, 89).

      Since all factors considered in the model were compared with each other in the questionnaire, the possibility that one variable was not considered was equal to zero. On the other hand, the questionnaire compared and measured all criteria in a pairwise manner. Therefore, maximum possible questions with the desired structure were asked from the subjects. Since all the criteria were included in this assessment, the designer could not be biased in designing the questions. Then, it was not essential to assess reliability. Moreover, the questionnaire is based on AHP and scale of hours. Thus, the incompatibility index was used to investigate the questionnaire, which is discussed in Chapter II. These indicators express that if inconsistency of pair-wise comparisons is more than 0.1, it is better to reconsider the comparisons. (Mehregan, ibid, 91)

      This research was conducted based on research techniques in operations. Delphi technique was used to identify the most important and effective parameters to absorb liquidity. Multiple criteria decision-making and AHP models were used to prioritize criteria of the study. AHP software was used for data analysis.

Research findings:
Identifying the main criteria using Delphi technique:

      Several items were collected to identify effective criteria in marketing management to absorb liquidity in Tejarat bank based on research literature through interviews with expert in this study. Delphi technique was used for screening and filtering the criteria. In fact, Delphi technique was used to answer the research first hypothesis. "What are the most important and effective factors in marketing management to absorb liquidity in Bank Saderat Iran?"

      For this purpose, a questionnaire with desired criteria was sent to each member individually and confidentially. The members were asked to assign a score to each criterion from 1 to 10. Then, the questionnaires were collected. Here, faster Delphi method was used. Then, the mean score assigned to each factor by the members was calculated. Then, factors with a higher score than seven were selected as final factors.

According to final analysis, fifteen criteria were identified as the main criteria for decision-making. The final results of Delphi technique, set of criteria and alternatives are given in Table 1 of the model.

Table 1: final criteria and sub-criteria of decision-making

Criteria	Indicators	Symbol
Internal organizational factors	Proper structure of the organization	S11
	Proper management of resources	S12
	Management information system	S13
	Adequate training to colleges	S14
External organizational factors	Liquidity provision tools	S21
	Imposing communicated policies of the central bank	S22
Short-term non-cash assets	Financial markets securities	S32
	capital markets securities	S33
Long-term investments and granted facilities	Granted facilities	S41
	Investment and partnerships	S42
Long-term obligations and stakeholders' capital	Received credit and loan	S51
	Unexpected withdrawal of stakeholders' capital	S52
Deposited obligations	Current deposits	S61
	Savings deposits	S62
	Investment deposits	S63

Analytical Hierarchical Process:

      Super Decision Software was used to analyze research conceptual model. This model is merely used to determine the weight and importance of criteria and indicators used. Therefore, a three-level structure of objective, criteria and sub-criteria was used in this model.

Comparing and prioritizing the main criteria based on objective:

Importance coefficient of each one the main criteria is calculated using paired comparison of main criteria based on objective. For this purpose, viewpoints of 30 experts were used. Eigenvector was calculated using geometric mean and normalization of values techniques. According to Sa'ti and Azkel, when viewpoints of more than one expert are used, the best solution is using geometric mean of experts' viewpoints. Therefore, eigenvector was calculated using geometric mean and normalization of values techniques. The values showed the importance coefficient of each one of the main criteria.

Calculations are presented in Table 1. Eigenvector is shown as W_1.
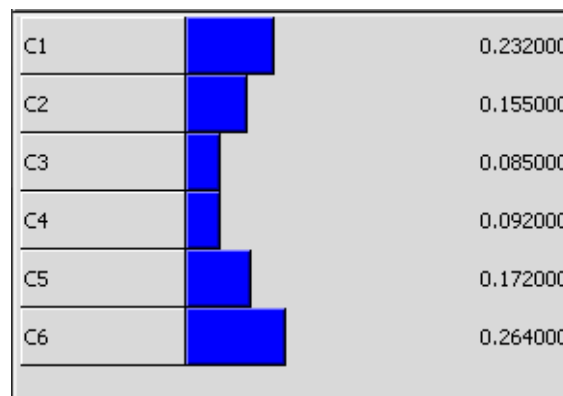
Table 2 : identifying priority of the main criteria

	C1	C2	C3	C4	C5	C6	EV
Internal organizational factors	1	1.560	1.671	1.698	1.835	1.885	0.232
External organizational factors	0.641	1	1.337	2.405	1.722	0.391	0.155
Short-term non-cash assets	0.599	0.748	1	0.444	0.434	0.441	0.085
Long-term investments	0.589	0.416	2.252	1	0.343	0.308	0.092
Long-term obligations	0.545	2.305	2.305	2.918	1	0.302	0.172
Deposited obligations	0.531	2.555	2.267	3.248	3.306	1	0.264

CR=0.075

Thus, eigenvector of priority of the main criteria will be as W_1.

$$W_1 = \begin{bmatrix} 0.232 \\ 0.155 \\ 0.085 \\ 0.092 \\ 0.172 \end{bmatrix}$$

Output of super decision software to identify priority of the main criteria is presented in figure 1.

Fig. 1: Output of super decision software to identify priority of the main criteria based on objective

Based on obtained eigenvector:
- The highest priority is criterion of deposited obligations with normalized weight of 0.264.
- Internal organizational factors with normalized weight of 0.232 are the second priority.
- Criteria of long-term obligation with normalized weight of 0.172 are the third priority.
- External organizational factors with normalized weight of 0.155 are the next priority.
- Short-term non-cash assets have the lowest priority.

The adjustment coefficient of comparisons is obtained as 0.089. Since it is smaller than 0.1, comparisons are reliable. Then, deposited obligations are the most important criterion affecting marketing management to absorb liquidity.

Comparing and identifying priorities of sub-criteria (indexes):

After paired comparisons of the main criteria based on objective were conducted, importance coefficient of each sub-criteria was calculated. Fifteen sub-criteria were identified for research six indicators. Here, viewpoints of 30 experts were used to prioritize sub-criteria. Eigenvector was calculated using geometric mean and normalization of values techniques.
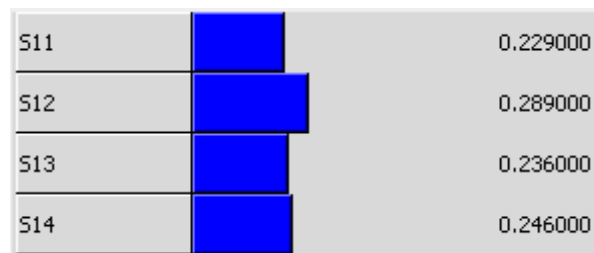
Calculations for determining priority of sub-criteria of internal organizational factors are presented in Table 3. Adjustment coefficient of comparisons is also provided in sub-table.

The adjustment coefficient of all comparisons is obtained smaller than 0.1. Then, comparisons results are reliable.

Table 3: identifying priority of sub-criteria of internal organizational factors

	S11	S12	S13	S14	Eigenvector
Proper structure of the organization	1	0.603	1.067	1.122	0.229
Proper management of resources	1.660	1	1.122	0.976	0.289
Management information system	0.937	0.891	1	0.962	0.236
Adequate education to colleges	0.891	1.025	1.039	1	0.246

CR = 0.0150

Fig. 2: identifying priority of sub-criteria of internal organizational factors

Based on obtained eigenvector:

The highest priority refers to sub-criteria of proper management of resources with normalized weight of 0.289.

Sub-criteria of adequate training of colleges with normalized weight of 0.246 are the second priority.

Sub-criteria of management information system with normalized weight of 0.236 are the next priority.

Sub-criteria of proper structure of the organization with normalized weight of 0.229 have the lowest priority.
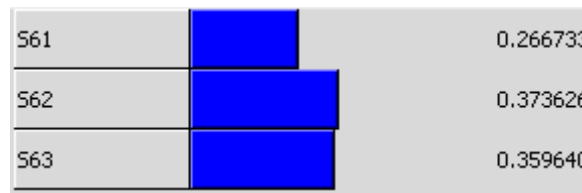
However, in general, the priorities are very close together. Moreover, the adjustment coefficient of comparisons is obtained as 0.015, which is smaller than 0.1. Therefore, comparisons are reliable.

Thus, among internal organizational factors, information management systems are the most effective factors in marketing management to absorb liquidity compared to other factors. The results showed that among internal organizational factors, sub-criteria of proper management of resources have the highest priority. Sub-criteria of management information system are the third effective factor in marketing management to absorb liquidity. Criteria of deposited obligations are composed of three sub criteria. Therefore, three paired comparisons are needed to determine the ultimate priority of sub-criteria. Calculations for determining priority of sub-criteria of deposited obligations are presented in Table 4.

Table 4: determining priority of sub-criteria of internal organizational factors

	S61	S62	S63	EV
Current deposits	1	0.588	0.901	0.267
Savings deposits	1.700	1	0.856	0.374
Investment deposits	1.110	1.168	1	0.360

CR = 0.0152

S61		0.266733
S62		0.373626
S63		0.359640

Fig. 3: identifying priority of sub-criteria of technical performance assessment

Based on obtained eigenvector:
The highest priority refers to sub-criteria of savings deposits with normalized weight savings of 0.374.
Sub criteria of investment deposits with normalized weight of 0.360 are the second priority.
Sub-criteria of current deposits with normalized weight of 0.267 have the lowest priority.
Moreover, adjustment coefficient of comparisons is obtained as 0.015, which is smaller than 0.1. Therefore, comparisons are reliable.
Other criteria under study only consist of following two criteria. Therefore, only one comparison is needed. Therefore, there is no need to calculate adjustment coefficient.
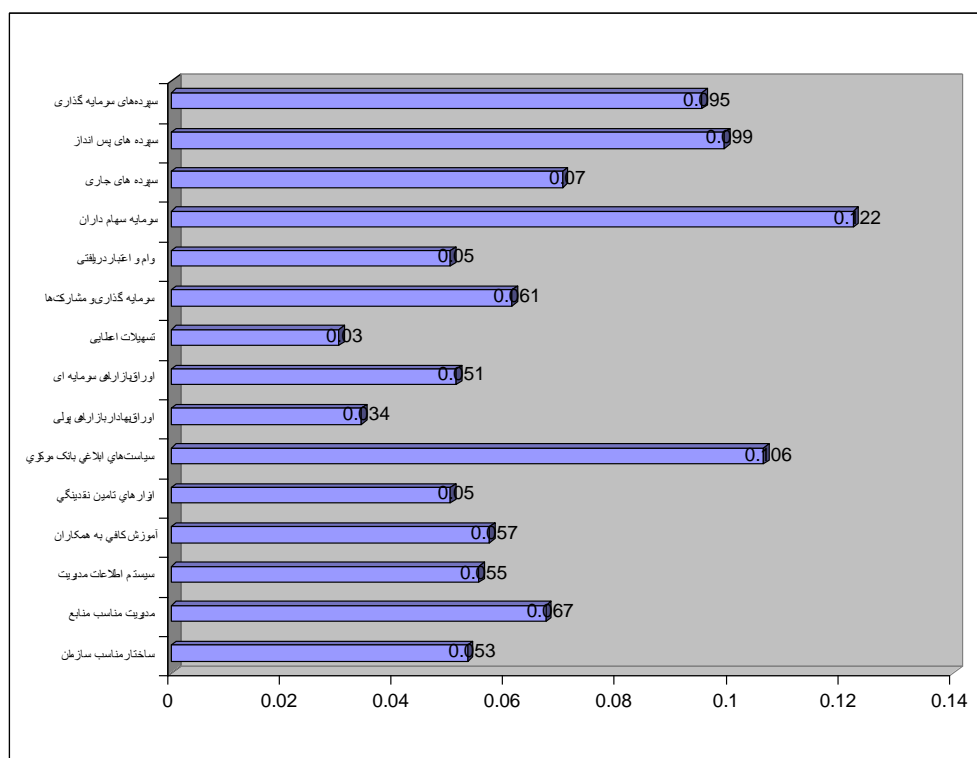Research sub-criteria comparison results and their corresponding weights compose W2 matrix given in Table 4-5. Thus, among external organizational factors, liquidity provision tools are more effective than communicated policies of the central bank in marketing management to absorb liquidity. Paired comparisons based on selected experts' viewpoints showed that communicated policies of central bank are more important than liquidity provision tools.

Determining and prioritizing final weight of indexes:
Weight of each indicator is calculated using weight of every main criteria (W1) and sub-criteria (W2). For this purpose, weight of each sub-criterion is multiplied by weight of main criteria. Super decision software was used for calculation. Finally, super matrix of preference options is multiplied by final weight of criteria. Then, it is possible to calculate final priority of options. Based on eigenvector obtained in the first phase (W1) and eigenvector of sub-criteria comparison (W2), final weight and priority of each of the indicators can be identified. The final calculations are presented in Table 5.

Table 5: final prioritization of decision criteria and sub-criteria

Criteria	Weight of criteria	Indicators	Final weight	Rank
Internal organizational factors	0.232	Proper structure of organization	0.053	10
		Proper management of resources	0.067	6
		Management information system	0.055	9
		Adequate training to colleges	0.057	8
External organizational factors	0.155	Liquidity provision tools	0.050	13
		Imposing communicated policies of the central bank	0.106	2
Short-term non-cash assets	0.085	Financial markets securities	0.034	14
Long-term investments and granted facilities	0.092	Granted facilities	0.030	15
		Investment and partnerships	0.061	7
Long-term obligations and stakeholders' capital	0.172	Received loan and credit	0.050	12
		Unexpected withdrawal of stakeholders' capital	0.122	1
Deposited obligations	0.264	Current deposits	0.070	5
		Savings deposits	0.099	3
		Investment deposits	0.095	4

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Fig. 4: final priority of indicators, super decision software output

Investment deposits
Savings deposits
Current deposits
Stakeholders' capital
Received loan and credit
Investment and partnerships
Granted facilities
Capital markets securities
Financial markets securities
Communicated policies of the central bank
Liquidity provision tools
Adequate training to colleges
Management information system
Proper management of resources
Proper structure of organization

According to the calculations:
Index of unexpected withdrawal of stakeholders' capital with normalized weight of 0.122 has the highest priority.
Index of communicated policies of central banks with normalized weight of 0.106 has the second priority.
Index of savings deposits with normalized weight of 0.099 has the third priority.
Index of investment deposits with normalized weight of 0.095 has the fourth priority. Index of current deposits with normalized weight of 0.070 has the fifth priority.
Index of proper management of resources with normalized weight of 0.067 has the sixth priority.
Index of investment and partnership with normalized weight of 0.061 has the seventh priority.
Index of adequate training to colleges with normalized weight of 0.057 has the eighth priority.
Finally, index of granted facilities with normalized weight of 0.030 has the least priority.

Discussion and conclusions:
In the first step of the analysis, the research first question was answered using Delphi technique. What are the main parameters affecting marketing management to absorb liquidity in Bank Saderat Iran?

Library studies results, interviews with experts and Delphi technique showed that the most important key indicators of marketing management to absorb liquidity are: proper structure of organization, proper management of resources, management information systems, adequate training to colleagues, liquidity provision tools, imposing communicated policies of central banks, financial market securities, capital markets securities, granted facilities, investments and partnerships, received credit and loan, unexpected withdrawals of stakeholders' capital, current deposits, savings deposits and investment deposits. For better understanding, these indicators and criteria are depicted as the framework of hierarchical graph.
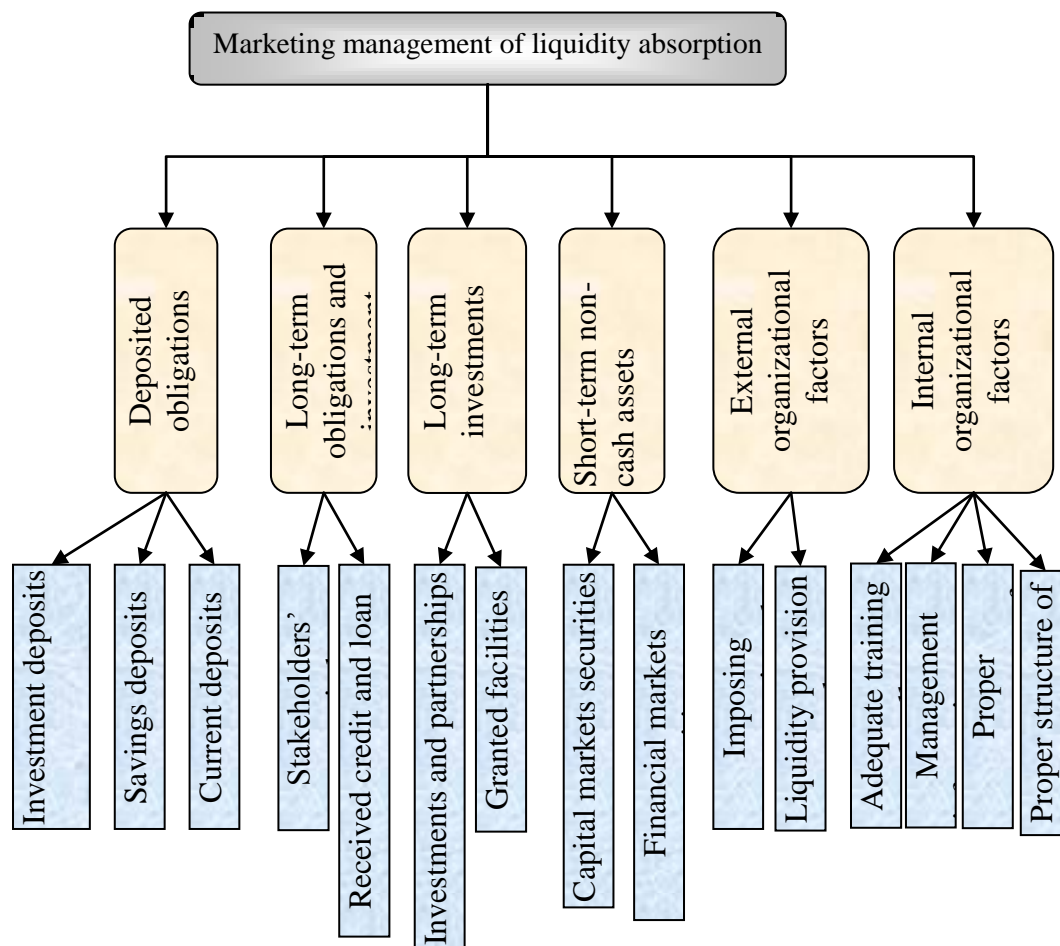
Fig. 5: key factors and indicators of liquidity management

In the second step, each one of the identified criteria was compared and prioritized using AHP technique. In this step, the second question was answered.

What are the main factors affecting marketing management to absorb liquidity in Bank Saderat Iran?:
According to calculated eigenvector: Index of unexpected withdrawal of stakeholders' capital has the highest priority. Index of communicated policies of central banks has the second priority. Index of savings deposits has the third priority. Index of investment deposits has the fourth priority. Index of current deposits, index of proper management of resources, index of investment and partnership, index of adequate training to colleges are the next priorities. Finally, index of granted facilities has the least priority.

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